Alternative timelines

Auger, James; Hanna, Julian

Anticipation

2022

INTERNATIONAL CONFERENCE ON ANTICIPATION

November 2022

Arizona State University, Tempe, AZ

ABOUT THE CONFERENCE

Anticipation 22 is a unique, radically interdisciplinary conference for exploring how ideas of the future inform action in the present. With an emphasis on just futures, we seek contributions that explore equity and fairness and question who imagines futures and with which impacts. We invite researchers, scholars and practitioners engaging with anticipation and anticipatory practices to come together to deepen their understanding and create productive new connections.

The overarching aim of the conference and of the interdisciplinary field of Anticipation Studies is to create new understandings of how individuals, groups, institutions, systems and cultures use ideas of the future to act in the present. This conference will build on prior conferences in Trento, Italy (2015, led by Roberto Poli), London, England (2017, led by Keri Facer) and Oslo, Norway (2019, led by Andrew Morrison). Anticipation 22 will emphasize questions of justice and is devoted to opening up the study of anticipation to new voices, new spaces and new approaches.

This fourth conference will emphasize questions of justice. Living with intractable and ineradicable uncertainty leads humans to read the tea leaves, consult the oracle, and tell imaginative stories. Increasingly, we tend to reach for forecasting, statistical analysis and data-driven scenarios, oftentimes narrowing the production of particular types of futures. The Anticipation Conference in 2022 is devoted to opening up the study of anticipation to new voices, new spaces and new approaches.

The offerings collected in this collection of abstracts pursue diverse topics—climate change, transitions to justice, AI, energy, poverty reduction, economic systems, health and wellbeing, innovation, food security—across a range of sectors, and embracing different disciplinary perspectives and methodological approaches. Many center questions of equity, fairness, diversity and inclusivity and question who imagines futures and with which impacts.

While casting a broad net, many of the sessions in the conference speak to the following themes and questions and are designed to encourage conversations between researchers, practitioners and scholars addressing anticipatory phenomena and practices in different ways.

THEMES

1. Public Futures

How can futuring and anticipation be a shared public good?
How are spaces for public anticipation being designed and implemented? Who is centered and excluded from these?
How can communities be empowered to create and act on their own futures?
What impedes and enables engagement with plural futures?
What are the best mechanisms for nurturing a broad societal capacity for anticipation?

2. Politics, Justice and Ethics of Anticipation

How is power wielded, shared, transferred or negotiated in anticipatory practices?

How do anticipatory regimes produce and/or reimagine governance?

How do the political dimensions of anticipation promote or impede progress towards more just futures?

Which worldviews, principles or practices are involved in ethical– and unethical– anticipations?

3. Decolonizing Anticipation

What do the flows of knowledge on anticipation between the global north and the global south look like?

How is anticipation connected to emancipation, revolution, activism and social movements?

What methodological and ontological perspectives are opened up through indigenous futuring?

How do different cultures, religions and traditions anticipate?

What can ethnography, sociology, comparative studies, regional studies, and other disciplines show us about cultural variations of anticipation?

4. Critical Anticipatory Capacities

How do community and organizational infrastructures promote futures thinking and anticipatory capacity building?

What is the role of emotion—delight, serendipity, surprise, anxiety, dread and wonder—in anticipatory thinking and practice?

Which forms of literacies buttress anticipatory capacities?

What is the role of educational institutions in fostering capacities for anticipation and for critique of anticipatory work?

5. Creativity, Innovation and New Media

What creative, artistic, design-based and avant-garde approaches are in play?
How can new media, VR/AR, immersive experience design and games be deployed to activate better futures?
What is the interaction between the analogue and digital, the live and virtual in anticipatory practice and foresight?
What media and IT systems are being used to create future narratives, and what types of affordances, limitations and trade-offs do they enfold?

6. Time & Temporalities

How can temporality studies problematize and pluralize anticipatory practices?
How is temporality understood at different scales and by different disciplines?
How does temporality impact governance and justice?
What are the histories of the future? Which concepts and practices help us to use the past to inform alternative futures?
What is the role of intergenerational dialogue in anticipation?

What follows is a collection of the abstracts submitted by participants to **Curated Sessions**, intended to share new knowledge and generate interdisciplinary discussion; **Independent Paper Sessions** offering a substantive engagement with conference themes;

Techniques Workshops designed to enable practitioners and researchers to test out or share new techniques in the practice or study of anticipation; and **New Ideas Sessions**, a space for participants to share emerging research, theories or ideas.

ACKNOWLEDGEMENTS

Organizing Committee

Local Organizing Committee is composed of:

Cynthia Selin

Cynthia Selin is an Associate Professor in the School for the Future of Innovation in Society and the School of Sustainability at Arizona State University, USA. She investigates and invents methodologies for making sense of change and explores theoretical questions about anticipation. By creating new transdisciplinary methods, concepts and platforms for confronting uncertainties, Dr. Selin's work – as a social scientist and scenario practitioner—stimulates improved strategic and imaginative capacities. She is also an Associate Fellow at the Saïd Business School, University of Oxford and teaches in the Oxford Scenarios Programme.

Lauren Withycombe Keeler

Lauren Withycombe Keeler is an Assistant Professor, foresight practitioner, and futures scholar in the School for the Future of Innovation in Society at Arizona State University. In her research, she studies how different communities and groups understand and make sense of the future. She creates and utilizes futures methods to anticipate the future impacts of emerging technologies, policies and other interventions on organizations, communities and cities. Her work focuses on building capacity among individuals and groups to think

about the future in ways that yield more inclusive and sustainable futures, and developing strategies to make those futures a reality.

Malka Older

Malka Older is a writer, aid worker, and sociologist. Her science-fiction political thriller Infomocracy was named one of the best books of 2016 by Kirkus, Book Riot, and the Washington Post. She is the creator of the serial Ninth Step Murders, currently running on Realm, and her acclaimed short story collection And Other Disasters came out in November 2019. She is a Faculty Associate at Arizona State University's School for the Future of Innovation in Society and her opinions can be found in The New York Times, The Nation, and Foreign Policy, among other places.

Ruth Wylie

Ruth Wylie is the Assistant Director of the Center for Science and the Imagination and an associate research professor in the Mary Lou Fulton Teachers College. Ruth uses her training in computer science, cognitive science, and education to do transdisciplinary, translational research to answer real-world problems. Her previous research projects have focused on improving science self-efficacy for young people, creating educational technology to support teachers and students, and developing methodologies to support collaborative imagination.

Alexandrina Agloro

Alexandrina Agloro is an ancestral technologist whose work spans the intersection of media art, community-based research, and birthwork. She is an Assistant Professor of Science, Technology, and Innovation in the Borderlands at the School for the Future of Innovation in Society and a Senior Global Futures Scientist at the Julie Ann

Wrigley Global Futures Laboratory at Arizona State University. Dr. Agloro's work lingers on how decolonization is deeper than a set of values, and anticipates how land, water, body, and internet sovereignty can move us from the imaginary into collective action. She is a Director of Situated Critical Race and Media (SCRAM), a multiverse collaborative feminist technology organization, and is the Futurist for the Latinx Pacific Archive.

Elma Hajric

Elma Hajric is a researcher in the Human and Social Dimensions of Science and Technology PhD program at the School for the Future of Innovation. Her work focuses on data governance of emerging technologies, centering surveillance and privacy, alongside 'smart city' sociotechnical imaginaries. She is also a National Science Foundation Fellow in the National Research Traineeship on Citizen-Centered Smart Cities and Smart Living, and a member of the Science, Policy, Engineering Collective in the Institute for the Future of Innovation at Arizona State University.

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Julie Ann Wrigley Global Futures Laboratory

The emergence of the Julie Ann Wrigley Global Futures Laboratory™ at Arizona State University is rooted in the conviction that we can and must make a meaningful contribution to ensuring a habitable planet and a future in which well-being is attainable for all humankind. This laboratory draws on ASU's deep commitment to use-inspired research, our ongoing work in sustainability and service to the global community in which we live.

School for the Future of Innovation in Society

The School for the Future of Innovation in Society is a transdisciplinary unit at the vanguard of ASU's commitment to linking innovation to public value. We are pursuing a vision of responsible innovation that anticipates challenges and opportunities, integrates diverse knowledge and perspectives, and engages broad audiences. By examining the ways we translate imagination into innovation—and how we blend technical and social concerns along the way—we learn to build a future for everyone.

Center for Science and the Imagination

Arizona State University's Center for Science and the Imagination brings writers, artists and other creative thinkers into collaboration

with scientists, engineers and technologists to reignite humanity's grand ambitions for innovation and discovery. The center serves as a network hub for audacious moonshot ideas and a cultural engine for thoughtful optimism. We provide a space for productive collaboration between the humanities and the sciences, bring human narratives to scientific questions, and explore the full social implications of cutting-edge research.

The Design School

The Design School is the largest and the most comprehensive design school in the nation. Our diverse programs are in the top 20 in the country and teach students to master their design disciplines. Students learn the art of collaboration and how to work across disciplines. The school's innovative spirit drives new ideas and solves problems through partnerships with industry, communities and other academic units.

The Center for the Study of Futures

The Center for the Study of Futures offers futures research, experimental practice, and innovative foresight training for diverse audiences. The Center for the Study of Futures at Arizona State University builds a cross-disciplinary capacity to imagine a rich variety of plausible futures, reflect on what those futures demand from us, and design pathways toward positive outcomes. By investigating and inventing new theories and methods for creating better futures, the Center aims to nurture and amplify future-oriented scholarship and practice.

Leonardo

Leonardo drives innovation at the intersection of arts, sciences, and technology. As an enterprising think tank and knowledge enterprise

of Arizona State University, Leonardo integrates hybrid, creative inquiry and practice as catalysts to solve compelling problems, explore timeless mysteries, and shape a finer future.

TABLE OF CONTENTS

The Americas, November 4

Tempe, Arizona, November 16

[Conference Welcome | The Organizing Committee](#)

Tempe, Arizona, November 17

Keynote: Aarathi Krishnan, The master's tools will not dismantle the master's house

Independent Paper: Decolonizing Anticipation: Paglalayag Tungo sa Hiraya, Awakening the Unconscious Imagination and Igniting Ethical Aspirations: The Case of Hiraya Foresight

Techniques Workshop: Collective, Science-based Climate Futuring: Making 'memories of the future' by combining IPCC scenarios, foresight and storytelling

Techniques Workshop: Strategic Artifacts: Tools and Activities for Anticipation

Curated Session: Performative Postnormality

Curated Session: Futures Thinking in K12 Education

Techniques Workshop: Necessary Tomorrows

Independent Papers: Participatory Futures

Independent Papers: Public Futures

Techniques Workshop: Going meta, anticipating anticipation: a workshop

Curated Session: Towards Ethical Anticipations of Educational Futures

Curated Session: Making Critical Futures

Keynote | Do we want a cyberpunk future?

Independent Papers: Mediated Temporalities

Independent Papers: Critical Technology Assessment

New Ideas Session II

Curated Session: Democratizing the 'use-of-the-future' through Futures Literacy as a capability and competence

Techniques Workshop: Thinking with water: material co-production in anticipatory governance

Independent Papers: Narrative Futures

Tempe, Arizona, November 18

[Keynote: Laura Forlano, Crip Futurity, Cyborg Disability and Designing the World Otherwise](#)
[Independent Papers: Design Futures](#)
[Independent Papers: Creativity, Innovation & New Media](#)
[Techniques Workshop: Prototyping Social Forms Workshop 1](#)
[Techniques Workshop: Learning Anticipatory Thinking](#)
[Curated Session: Stacking the Deck for Sustainability: Youth "Lessons" to Turn it Around](#)
[Curated Session: How can governance capacities support transformative pathways toward nature-based futures?](#)
[Independent Papers: Climate Imaginaries](#)
[Independent Papers: Policy-Oriented Anticipations](#)
[Techniques Workshop: Analyzing Future Social Value from Scenarios: An Invitation and Experiment](#)
[Techniques Workshop: Prototyping Social Forms Techniques Workshop](#)
[Curated Session: Anticipation in the scale of 'Deep Time'](#)
[Independent Papers: Theories of Anticipation](#)
[Independent Papers: Critical Anticipatory Capacities](#)
[Independent Papers: Energizing Public Futures](#)
[Curated Session: Foresight's Special Issue on Reconceptualising Foresight and its Impact: Learning about the Capacity to Decolonise](#)
[Curated Session: Prototyping Social Forms: UN ALTRO MONDO È POSSIBILE "Another world is possible"](#)
[Open Dialogue: College of Global Futures Graduate Student Synthesis](#)

ASIA PACIFIC, NOVEMBER 4

4TH INTERNATIONAL CONFERENCE ON ANTICIPATION ASIA PACIFIC

NOVEMBER 4, 2022

10:00-10:15 (Beijing)
Conference Welcome | The Organizing Committee

10:15-11:45 (Beijing)
Techniques Workshop: Co-creating futures through Fashion: a collective and speculative approach to a post-Anthropocene Era in futures-thinking
Clarice Garcia

By not being limited to a solve-problem approach, Design relies on criticism and imagination to reflect on alternative futures. In its turn, as part of our everyday lives, fashion is not limited to its materiality, but it can be seen as a collective reflection of immaterial societal values manifested through clothing. This workshop intersects Speculative and Critical Design with fashion-as-culture in a co-design session that aims to spark conversations about what set of cultural values could emerge, enable, or impede the flourishing of more sustainable futures. In a 60-min workshop, participants will be invited to conceptualize a fashion artifact from the future by considering emerging cutting-edge technologies and the inclusion of non-human

beings in the design process. The co-creation of a fictional fashion artifact aims to facilitate discussions about what values and meanings participants associate with the uses and aesthetics of objects from the future, challenging hegemonic thoughts, norms, and values in social, cultural, and political arenas. The question guiding this initiative is: how can the intersection between fashion, Speculative Design and Co-design enable collective stories about sustainability in pos-Antropocencric futures? The session is structured as a sequence of activities and prompts that instigate participants to discuss futures by using imagery, sketching and verbal language as methods.

10:15-11:45 (Beijing)
Independent Paper Session: Politics, Justice and Public Futures

Requestioning the structures of futuring and futurity to create a feminist ontology of becoming
Bridgette Engeler

"To concern oneself in the present about the future certainly does not consist in programming it in advance but in trying to bring it into existence" Irigaray in Grosz
This curated session proposes an interdisciplinary panel discussion comprising a 5 minute 'position statement' presentation from 3-4 presenters, followed by approx. 10 minutes of discussion before opening to Q&A. Educators, practitioners and professionals from diverse sectors will share their perspectives reflecting women, gender, LQBQTI and people of colour on anticipation and futures/foresight practice beyond normative heteropatriarchal futures discourse. Speakers from different backgrounds, cultures and communities will

be invited to participate including indigenous people, LGBQTI+, people of colour, and young people where possible.

Feminism can be understood as a criticism of, and resistance to, how society is perceived and structured both now and in the past, making it a driving force for transformation for futures. However, normative heteropatriarchal futures dominate discourse, therefore more clearly articulated feminist futures are needed to facilitate the ambition of change.

Panel members will share stories and visuals (and could use technology such as Menti to engage and elicit responses from conference attendees). Discussion will include how changing the narrative from normative futures that propagate the status quo (which isn't very equal) is critical in anticipating and influencing alternative futures in which equity is prioritised.

Radicalising the mundane: mobilising feminist futures for intergenerational and just transition

Bridgette Engeler and Susan Cox-Smith

The practices of strategic foresight and futuring have always acknowledged the critical role of the past and the present in anticipating and shaping futures. Futurists believe that the past is a driver to unfolding futures: they also assert that while understanding and analysing the past will not provide a true indicator of the one singular 'future' ahead, historical data cannot be ignored.

Feminist futuring workshops are sites of rehearsal for performing and conceiving differently, acknowledging past injustice and inequality while anticipating and influencing multiple alternative futures. There are implications for how this practice is designed, facilitated and materialised: anticipation itself can lead to repetition and ritual, or the physical enactment of what is anticipated, and social

norms are repeatedly reinforced when the subject is called upon, hence the need for intervention to shift the enactment and performativity.

In this paper we highlight the powerful and significant intersection of futuring and feminism, and explore why a commitment to inter-generational and intersectional feminist anticipatory approaches is required if we are to move toward more just futures for all. Using the global response to COVID-19 as the context for discussion, the authors consider the need for best practices for decolonised, futures-focused feminist collaboration across generations, and for intersectional feminist interventions in the cultural, structural and institutional systems that prevent innovative solutions to persisting problems of gender inequality.

The Book of Revelation: In Anticipation
Mg Michael and Katina Michael

Anticipation in the context of prophecy is prevalent in religio-historical texts, like the Bible. Perhaps in no other place, as much as The Book of Revelation, we observe anticipation in the declaration of the second coming of Jesus Christ. This paper explores anticipation in the context of biblical prophecy. A revelation or a divine promise cannot be "hurried up", that is to shorten the period of "anticipation" because then we end up with a misinterpretation of eschatological timeframes by fundamentalist communities or a purposeful erroneous reading by others for power gains. This forced anticipatory behavior has often been responsible for the phenomenon of the 'religious cult' and the cult leader, such as David Koresh and Jim Jones. Critically, what is lost on those who deduce meaning from prophecy outside its proper context and setting, its Sitz im Lebem, is that prophecy in both the Old and New Testaments is not always con-

nected to foretelling or to anticipatory events. Not rarely biblical prophecy would also mean to teach and/or to admonish, to hold people accountable before God, to encourage, and to make straight that which has been set off course

10:15-11:45 (Beijing)
Techniques Workshop: Regenerative X: A City Futures Game
Shermon Cruz, Toney Hallahan and Nicole Anne Kahn-Parreño

This research embarks from the recently completed research entitled "From Resilience to Regeneration: Reimagining Philippine Cities 2050 through Scenarios and Causal Layered Analysis." Using the scenario narratives, results, insights, and recommended next steps that emerged from the research, this project seeks to develop a serious foresight game on city futures dubbed initially as Regenerative X: A City Futures Game. Using gamification as an approach, the research aims to build a city futures game that incorporates scenario development, wildcards, regeneration, and the 17 SDG goals as game elements to facilitate futures literacy learning and capabilities.

The game design will be constructed in a way that enables participants to have scenario conversations that allows them to imagine plausible regenerative city futures. The 'print and play' game is envisioned as an anticipatory governance gaming technique to facilitate meaningful foresight exchanges. The game enables players such as city decision-makers, policy-makers, administrators, and citizens to reimagine sustainable city futures.
This session will take 90 minutes.

12:00-13:30 (Beijing)

New Ideas Session

Practicing Solarpunk: Speculating and making an urban interactive installation
Yue Zou

In response to climate change and the Anthropocene, Forlano (2017) argues that design needs to practice posthumanist issues to achieve the plural futures that people can imagine. Posthumanism raises the question of our need to form and be conscious of cultures that care about nonhumans. Meanwhile, the artificial intelligence scholar also argues a transformation from AI to MI (Multiple-Intelligence) that considers the collaborative relationships between humans, artificial intelligence, and natural intelligence (Fox, 2017). Most of the current research on speculative and anticipatory design is based on human-centred perspectives. There is a need for a collaborative-relationship-centric view to exploring futures to break the existing dualism that separates the artificial world from the natural world (Morton, 2018).

I will present a solar-powered interactive installation of light that may appear in different city corners as artificial intelligence or creatures. It could release different light with various effects according to the surrounding environment. Data generated by the surrounding environment may include humans, climate, and nonhumans. Furthermore, the light emitted could interact with humans and nonhumans in light interactions with emotional or biological effects. It could be an artificial public installation that humans share with other living things as part of converting solar energy and the natural world. This interactive installation may discuss and imagine the possibilities of future urban public facilities that are not human-centred by creating an urban scenario and human feeling.

This design idea shows the possibility of design as a research tool through materializing future scenarios. An installation that transforms data into light effects may extend the human's perception system and experience as an alternative way of knowing. The design installation acts as a data hub, which may also interact with remote participants in VR or AR, breaking the binary of physical and digital.

By presenting this design idea, I hope to get transdisciplinary feedback about more possibilities for urban facility design in the context of the Anthropocene and climate change. Also, I would like to get more opinions based on future-oriented approach to biocomputinonal design and my further research.

Putting Descartes before the (education) horse: Speculations on bio-technological evolution, multispecies relationships, and human exceptionalism
Punya Mishra, Iveta Silova, Simon Brown and Shiv Ramdas

This virtual session explores issues related to education and learning in an age where human-exceptionalism is increasingly being questioned from both a deeper understanding of our connectedness to life on the planet and the advent of General Artificial Intelligence. Both of these perspectives suggest that the difference between human and non-human species is just a matter of degree, not of kind. Specifically the session will explore the educational consequences of rejecting the dominant Cartesian worldview for a more interactionist, interactive, multi-agentic worldview. We bring together two acclaimed speculative fiction authors and two recognized educational scholars to discuss how our deeply interconnected pasts and emerging futures relate to learning in the future.

Anticipating alternative futures through co-designed speculative soundscapes

Ilya Fridman, Hannah Korsmeyer and Alon Ilsar

This research explores the question: How could co-design of speculative urban soundscapes contribute to anticipating alternative futures? It connects to the conference theme of Public Futures by considering how spaces for public anticipation may be created through speculative co-design approaches. Discourse from speculative research, co-design, and interactive sound design is brought together to argue for the inclusion of diverse community perspectives, particularly from vulnerable road users and disabled people, in the collective anticipation of public services during an energy and technology transition. These practices can help to influence and guide alternative choices in urban design and placemaking in the present.

As transport systems transition towards zero emissions electric vehicles (EVs), they are set to change our urban soundscapes, which have been dominated by noise from internal combustion engines over the last century (Clendinning, 2018). EV technologies provide a potential to reduce urban traffic noise through their quiet operation; however, they simultaneously raise safety concerns for pedestrians who may not hear a vehicle approaching (Yasui, 2019). In response to these concerns, countries are establishing regulations around the level of artificial sound that EVs must emit when travelling at low speeds (Liu et al., 2018). While these regulations stipulate that a sound must be emitted, they do not prescribe what that sound should be. Companies such as BMW, Toyota and General Motors are taking advantage of this design opportunity by employing sound designers, musicians, composers, and branding agencies to develop their vehicles' future sounds (Graza, 2021). Alongside personal vehicles, public

transit bus services are a significant part of urban soundscapes, often operating near homes, businesses, and pedestrian areas. With predictions that EV buses will increase their market dominance over the coming decades (Transport & Environment, 2018), this new imperative to develop artificial warning sounds creates an opportunity to anticipate a new array of future soundscapes for our cities and towns.

Traffic noise affects our quality of life. The Good City Life initiative (n.d.) shows how pervasive traffic sounds are in cities like London or New York and proposes that these generated soundscapes affect people emotionally over time. As well as being important for health and wellbeing, soundscapes also signal and reinforce the values and priorities that have given shape to certain places. Alternative soundscapes, like other speculative visions of the future, can help make what has become familiar about our world feel strange. They help us wonder 'what if things were different?' and 'how could things be different?'. For example, the City of Sounds and Silence by Sun City (2018) is an interactive speculative exhibit to imagine post-fossil future soundscapes. It immerses the listener in a possible future devoid of any internal combustion engine sounds. While it is effective for imagining an alternative to the present, this approach is a passive experience as the soundscape was pre-determined for the listener. This type of approach aligns with other EV sound studies that typically present people with pre-determined sounds and ask for their feedback.

The present imperative to decide how EV transit buses will sound calls for "collective design anticipation" (Zamenopoulos & Alexiou, 2020, p. 2) that can involve diverse community perspectives. Instead of experiencing or reacting to expert-generated future soundscapes,

communities should have an active voice in shaping the sound of transit bus services that are funded by and implemented for the public. Particularly community members who will be disproportionately affected by these technologies including vulnerable road users, such as cyclists (Stelling-Kończak et al., 2014) and people who are blind or have low vision, for whom these technologies bear potential physical, mental, and emotional health risks (Liu et al., 2018).

"Behaving in an anticipatory way means adjusting present behaviour in order to address future problems" (Poli, 2012, p. 2092). Design is by nature an anticipatory activity as it seeks the "construction of future realities" (Zamenopoulos & Alexiou 2020, p. 1). If we work backward from our hopes of a more inclusive future, the very first step we might take in the present is to adjust our approach to getting there. Co-design can be used to engage different vulnerable communities in shaping future public services (Micsinszki et al., 2021; Mimmo et al., 2021; Mulvale et al., 2019; Southern et al., 2014). Andrews (2014) provides an overview of various techniques and considerations for making design participation accessible for blind and visually impaired people. Southern et al. (2014) argue that the power to imagine futures should be extended to vulnerable communities to increase diversity in futures practices, as well as create a greater sense of understanding and agency for vulnerable people. They provide an example of how co-design can help to engage homeless people in imagining future healthcare services. Other examples include Winters et al. (2020) who showcase how blind and visually impaired students can be involved in co-designing educational experiences. Mimmo et al. (2021) who demonstrate how future patient hospital experiences may be co-designed with and for children and young people with intellectual disabilities. Public transit researchers and designers can learn from these examples to develop approaches for engaging diverse communities in exploring future public transit services and associated soundscapes.

In their study exploring technological futures through co-design, Polvora and Nascimento (2021, p. 7) observed the critical anticipatory role played by prototypes which helped to create "policy compasses for years ahead". Rather than urban futures being determined only by corporations or commissioned by public sector organisations for the public, speculative co-design approaches can be used to create interactive sound prototypes that actively include the public in anticipating and working towards these futures. Doing so would introduce different ideas and priorities into decision-making to guide the development of cities in alternative, perhaps more inclusive, directions.

12:00-13:30 (Beijing)
Curated Session: Temporalities in Art and Design: a Cross-cultural Conversation
Berstrand Tordis, Amir Djalali, Yiping Dong, Teresa Hoskyns and Claudia Westermann

CRAC is a collective of scholars, architects, and artists engaging in research on China's places, and the complexities of relations these places embody between modernisation and tradition, local, regional and global, the rural and the urban. CRAC is developing a platform for crosscultural and interdisciplinary discourse and collaborative research on contemporary architectural issues and knowledge exchange that situates China within an unfolding global narrative. Within this context, CRAC has initiated a project on the temporalities in art and design.

The proposed panel will introduce four perspectives as a starting point for a conversation designed for interaction with the audience.

The interaction will be multi-layered, experimenting with new online formats (wonder.me for example) and including also a visual concept map of temporalities (miro) that will be open for contributions by the audience.

Architectural discourse has provided many elements to approach the way in which design anticipates the future (see Coleman, 2019). Architect Aldo Rossi, for instance, pointed out three problematic attitudes linking architecture and the future: historicism, which conceives future as a return to the past, professionalism, an approach that technologically solves problems anticipating a future that already is, and Utopianism, the construction of a hypothetical future with no relation to the present. In these approaches, the future is not a radical departure from the present's realm of necessity: historicism accepts the past to be reproduced as it is, professionalism accepts the present as necessary, and Utopianism is content with a future that will never be.

To counter this impasse, we propose three different tools to liberate the anticipatory potential of the architectural project: genealogy, a study of a past as it actively affects the present; metis, a cunning technique exploiting the propitious moments to swerve the present; and hyperstition, a fiction that is capable of turning itself real by changing the past.

Art, Agency and the Logics of Initiation
In the 1943 short story, Mimsy Were the Borogoves, written by Lewis Padgett, a box with children's toys originating from a future time and place is sent to Earth. A young boy finds the box and carries it home. While he gains enough of an understanding of the toys to

play with them, to his parents, they remain obscure. It is the boy's baby sister, still unconditioned by language, who, from her understanding of a different order, shows the boy how the toys can form an exit, assisting both children to escape the world of prediction toward the future.

Commencing with the short story Mimsy Were the Borogoves, the presentation develops on the idea that all art entails what could be called a logic of initiation. It influences the time of the present through a model of the future that is suggestive and not predictive. Language matters in this context. An understanding of art, consequently, is feasible exclusively on the basis of a theory that extends the dominant Western models of binary logic and the linearity of time.

The presentation brings together understandings of aesthetics and art practice from the European, US American and Chinese contexts and juxtaposes these with philosophical explorations of anticipatory systems and their relation to time (Rosen, Rosen, Kineman, & Nadin, [1979] 2012), for a better understanding of how art anticipates the future.

Cross-cultural reflections on architecture and post-human temporalities

The natural world has long been conceived in Chinese thought as a complex arrangement of elements that are continuously changing and interacting. Time consists simply of the events of nature. This section discusses the meaning of 'nature' (phenomena of the physical world collectively) and discusses how it is conceived in Chinese architecture and the Chinese city. In the Chinese tradition, people are included in the 'myriad of things' 萬物 (Wan Wu) first introduced in the Laozi Daodejing, whereas as Bruno Latour noted, in the Western tradition there is a radical distinction between nature and culture.

The Chinese tradition introduces a different logic and can be linked to the discourse of ontological expansion (Tuomi, 2019) or relational ontology, where instead of a clean separation between "nature" and "culture" they mutually construct each other in the ongoing process of action and becoming.

One could argue that these principles of dao have largely been lost during the rapid expansion of cities in the late 20th and early 21st centuries. China is currently building new 285 eco-cities of the future, could this be seen as a return to the ancient principles or is this a new form of green capitalism?

Temporalities of architectural work
Architecture is an anticipatory practice per se with architects imagining, projecting and drawing future spatial environments into the world. They do so on the basis of collective acts creatively constructing futures that are foreseeable, buildable and inhabitable. Their work conditions the shared existence of humans, animals and things through complex negotiations of sites of intervention on an increasingly damaged planet.

The presentation explores the impact of ecological crises and looming unforeseeable disruption on the positive practice of architectural design. How to imagine, design and build futures with the requirement to reuse, reduce and scale down the amount of resources that the work expends? How to work along different conceptions of growth and renewal to anticipate futures that make up for lost ground? How to reorient the desire to construct new worlds towards preservation of what we have left?

With an eye to Donna Haraway's suggestion that we stay with the trouble and engage with the mess that we are in (2016), the presentation explores the shifting temporalities of architectural work. It looks to the practice of becoming 'Other-wise' mapped by John O'Reilly (Brassett & O'Reilly, 2021) involving methods for finding the future in the overlooked creases of the present. The anticipatory practice of architectural work thereby begins to unfold itself to discover the hidden resources.

14:00-15:30 (Beijing)
Curated Session: Design for Future Digital Well-being: Criticism, Anticipation and Innovation
Zhiyong Fu, Yuqi Liu and Yidan Wu

In this era of great changes, the fourth industrial revolution represented by artificial intelligence, the Internet of Things, cloud computing, big data, and blockchain is leading the global wave of innovation, rapidly changing the structure of the world's economic and social development. With the rapid development of science and technology, the double-edged sword power of technology is accelerating the tearing of human society tradition and the future from all dimensions, and also creating and aggravating the uncertainty of the future. Where should human society go?
The future led by the humanistic trend of thought, or the future led by technology?

The refutation of "humanities" and "technology" has become a topic of extensive debate between critical reflection and visionary anticipation. People are more and more eager to find the balance point of science and technology in complex systems from a new perspective,

and are eager to find the subtle but real "digital well-being". In a world where carbon-based civilization and silicon-based civilization coexist, reconstruction is suitable for human beings. Humanistic and ecological environmental order for sustainable development. The interdisciplinary nature of design is a powerful tool for exploring this meaning-giving and order-building. Think about technology from a critical and anticipatory perspective, integrate the desirable future we want to achieve with the future foreseen by technology, and explore the humanized application of digital technology in human society, that is, future-oriented digital well-being design. More precisely, people should realize that technology is a tool we use to improve our lives and support justice, and its development is also to serve the sustainable development and well-being of human society. People should not blindly focus on developing technology. itself. "Digital well-being" emphasizes how to realize science and technology for good, and guide human beings into a new era of integration of "high technology" and "high humanities" led by ecology.

Design for Future Digital Wellbeing is one of the key research areas of the Design Future Academic Team of Tsinghua University (the team that applied for the Session). The team has been working on academic research and project practice in the field of "Design Futures" from 2016 to 2021. In 2018, through the construction of AI City, an AI city installation integrating virtual and reality, the impact of the application of AI on human survival in future cities was discussed. In the future of diversity, find and build digital survival and socialization scenarios where humans and machines are in harmony. In 2020, the research theme of "New Space Economy", explores how human beings can transcend the constraints of the earth's environment and achieve sustainable survival in the universe when space technology matures and interstellar settlement becomes possible in

the future. Through the expression of digital scenes, we can speculate on the challenges that human space survival may face in the future.

In 2022, the reshaping of the metaverse scene of cultural heritage will be launched, and the integration of historical civilization and emerging media, ecological situation and virtual experience will be explored to establish a new cultural space for the next generation.
The design of future digital well-being urgently needs more dimensions of action subjects, incorporating complex cognitive skills, such as creativity, speculative and criticality into design strategies, balancing the complex impact of digital technology, and improving the "well-being" in design. "The weight of thinking. Through the integration of art and science, it explores how to transform the needs of human psychological, emotional and physical health into the well-being of the intelligent age, and map it into the digital social well-being of industrial development, regional balance and group justice.

The group's proposal seeks to explore the complexities of future digital well-being design and to engage in critical dialogue on relevant research questions:
1. From physiology to ego, from motivation seduction to personality attachment, from human enhancement to post-human beings, how can human beings return to human nature in digital existence, and explore the design and sustainability of complex systems that are suitable and beneficial to human nature?
2. In the context of globalization, how to explore the delicate balance of multiple changes, how to bridge the digital divide that may be brought about by new media, cross-regional limitations, and design a more equal, more just, and more inclusive digital connection?

3. The sustainability of human civilization depends on the virtuous circle of people, society and ecological environment. How can use digital new media to structure a more diverse context, a more sustainable ecology, and seek higher-dimensional digital well-being with a new identity?

4. The future is here, but unevenly distributed. When designing for the future of digital well-being, how to use design foresight to seek out new frameworks, new models, new approaches, new products, and ways of coping with possible unintended consequences?

The Session is supported by the design future academic research team of the Academy of Arts and Design of Tsinghua University. The academic leader is Professor Zhiyong Fu.

14:00-15:30 (Beijing)
<u>Curated Session: Probing Impacts to Imagine More Inclusive Possible and Preferable Futures</u>
Susan Cox-Smith and Bridgette Engeler

Futuring draws on many facets and acts of creativity and imagination, including world building as transformational politics. This proposed workshop is a deep, but brief dive into the joys and challenges of producing counter-narratives for our current world, to foster contemporary imaginings of futures and 'sites' of cultural construction. This workshop aims to harness the powers of collaborative imagination within our communities by working to envision multiple possible futures. The work of considering possible alternative futures is an act of resistance, it challenges the injustices, and inequitable systemic power structures. The co-creation of possible futures is an active exercise of imagining a world which aims to transcend the op-

pressive ideologies that prevail. By seeking to shape or steward directions of futures, we are no longer passive but make the most of our agency.

In June 2020, the presenters were asked to develop a workshop format for the International Women's Development Agency (IWDA), based in Melbourne, Australia, to explore preferable feminist futures in post-Covid 2030. The workshop had to be easily understood by non-futures-expert participants, adaptable across different cultural and language contexts, and produce relevant, actionable insights. Our goal was to shift perceptions away from perceiving uncertainty as only about risk mitigation, then employing uncertainty as a way to explore new opportunity spaces for imagining more effective policies, services and products. We developed this workshop format incorporating Futures Wheels as its main mode of engagement.

This workshop utilizes a set of twenty-four trends as focus content, as well as defining a set of Privileging Forces, and setting out a range of Guiding Principles to provide sufficient content to frame conversations and help guide participants to actionable results. Using a Futures Wheel canvas the teams select one trend then work outward suggesting possible impacts (both positive and negative) which may emerge from this trend over the next ten years. Reflecting on their wheels, each team chooses a "thread" of impacts to consider how a more preferable and equitable future might be achieved. This workshop is designed to help non-futurists become more adept at thinking about possible futures, even in times of high uncertainty.

14:00-15:30 [Beijing]

Curated Session: Enoughness-- Towards a Recalibration of Our Anticipatory Capacities

Mushfiqa Jamaluddin and Klelija Zivkovic

The purpose of this research is to re-examine our relationship to and embodied experience of our needs, wants, and desires when situated within what the design theorist Tony Fry calls a "felt knowledge of unsustainability." We inhabit a world so deeply shaped by accumulation in the pursuit of a false sense of safety and freedom that we have also become estranged from our capacity to experience a felt sense of having enough. The visionary author Miki Kashtan speaks about the illusion of separation that money and resources allows us to create, which offers the feeling that we are independent and can therefore independently create certainty for ourselves. But this is not the nature of accumulation - it is not a process which will subside by itself. Left to its own devices, accumulation will continue, further stimulated by the idea that we can optimize ourselves out of imperfection.

In a world of interdependencies and continual change, safety is only ever temporary. We propose that experiencing Enoughness requires an acceptance of our inherent insecurity and dependence on the world - and a radical trust that, nevertheless, we will be okay. A practice to bring us closer to, not further away from, the inherent fragility of life.

Anticipation is a critical cognitive skill and anticipating the future means that the future also constitutes our present. If we are considering what is and will be enough for us, it includes an anticipation of our needs in the future, both near and far. Our tendency towards

endless, mindless accumulation then could be understood as a result of poor or weakened anticipatory capabilities. Such capacities have been led astray and we argue that they are in need of recalibration.

We aim to explore Enoughness as a principle rather than a promise of a continued state of bliss and efficiency. We posit that Enoughness plays a role in developing habits of compassion and humility towards others as well as our future selves, and further, that these habits are critical to anticipating and bringing forth just futures.

As a transdisciplinary duo of futurist + designer, and supported by a collaborative network of designers, artists, futurists, coaches, philosophers, researchers, and practitioners, we are inquiring into the role of emotions in developing an embodied understanding of Enoughness. We propose to engage in a research process using a phenomenological approach to explore the essence of Enoughness and how it might help us recalibrate our anticipatory capacities.

15:45-16:15 [Beijing]
<u>Keynote: Invoking indigeneity to reimagine the knowledge base and practice of anticipation</u>
Shermon Cruz

Our indigenous ancestry, heritage, values and culture informs and broadens our perspectives of what is possible. It expands the edge of our understanding, and could open a vast field of opportunities to fuel our imagination. Existing anticipatory thinking tools and foresight methodologies are heavily influenced by Western and Eurocentric paradigms and experiences, with indigenous ways of knowing, more often than not, are excluded from these narratives. Current an-

ticipatory practice rarely makes room for indigenous ways of knowing and imagining. The perspectives of indigenous communities on the future differ in that they incorporate a deep sense of community, and connection with the aspirations of past generations. Indigeneity in futurity heavily relies on the narratives constructed with intergenerationality and values at its core, and these have been lost to the communities that were assaulted and colonized.

Colonial representations of the future have become inextricable from how these communities perceive and imagine preferred future worlds.

This talk seeks to introduce and accentuate the use of indigenous ways of knowing to hack new radical imaginaries and reveal new pathways and understanding to the study and practice of anticipation. It draws from a decade of practice and case studies from the insights shared by participants using the engaged foresight approach to anticipation. The method seeks to reconceptualize anticipation and ignite a more reflexive praxis of foresight.

EUROPE, AFRICA, MIDDLE EAST, NOVEMBER 4

4TH INTERNATIONAL CONFERENCE ON ANTICIPATION EUROPE, AFRICA, MIDDLE EAST

NOVEMBER 4, 2022

09:00- 09:15 AM (London)
Conference Welcome | The Steering Committee

9:15-10:45 (London)
Curated Session: Dis/assembling the power of energy futures
Magdalena Kuchler, Gavin Bridge, Naima Kraushaar-Friesen, Gubb Marit Stigson, Kosma Lechowicz and Isak Stoddard

The urgency of climate change and the necessity to accelerate global mitigation efforts have prompted energy researchers to move from analysing the fossil fuel-dominated past towards anticipating fossil-fuel-free futures. Among different approaches that can help us better understand energy futures, the concept of sociotechnical imaginaries (STIs) has been increasingly employed in social science research to scrutinise the power to imagine future transition pathways or the impotence to imagine alternative energy futures (Jasanoff and Kim 2009, 2015; Kuchler 2014, 2017; Kuchler and Bridge 2018). The STIs approach highlights the cultural and political work done by the shared social meanings associated with technical infrastructures and

how "the capacity to imagine futures is a crucial constitutive element in social and political life" (Jasanoff and Kim 2009: 122). Recent work on natural resources, however, shows how the capacity to imagine energy futures is strongly shaped by – and often trapped within - the resources, infrastructures and materialities of the present and/or past (Kuchler 2014, 2017; Kuchler and Bridge 2018). Moreover, by arguing that imaginaries "project visions of what is good, desirable, and worth attaining for a political community" (Jasanoff and Kim 2009: 123), a critical question arises as to "whose visions of future possibilities these are, for whom they are good and desirable (…), and why certain policymakers would find them worth realising" (Kuchler 2014:433). Additionally, research increasingly observes how sociotechnical imaginaries of energy futures often entail plural (and sometimes competing) temporalities (Kinsella 2020; Kristoffersen et al. 2021; Mutter and Rohracher 2021). For example, some energy visions require more time to become embedded into specific institutions or materialities, while others face resistance much more quickly.

The overall aim of this Curated Session is to undertake some co-creative, -critical thinking about the processes of anticipating and (re)imagining energy futures. We will explore the utility and limits of STIs as a conceptual framework for understanding the social power of energy imaginaries. We will also consider how climate emergency and the urgency of disassembling incumbent fossil-fuel infrastructures challenge parts of the STI framework and provoke novel ways of conceptualising how energy futures are anticipated and imagined. The session is anchored by four original papers focused on the anticipation of energy transition. It uses these papers to develop an empirically-grounded and conceptually-informed conversation on the potential and challenges of the STIs concept in exploring energy fu-

tures. In doing so, the session takes inspiration from – and aims to take forward – an interdisciplinary body of work on energy imaginaries that reaches across science and technology studies (STS), anthropology, political ecology, and cultural and political geography.

More specifically, the Session aims to explore the methodological and theoretical challenges of employing the STI concept to analyse energy futures in relation to three distinct but interrelated themes:

1) Collectives – unpacking the notion of collectively anticipating and imagining energy futures; what scale does a collective entail, and what are the implications of scaling these collectives up or down for struggles to imagine and define ambitious climate/energy policies?
2) Temporalities – identifying the multiple temporal dimensions in the imaginaries of fossil-free futures and how such temporalities are induced and reshaped by the necessity to accelerate climate mitigation, as well as how these different – often unsynchronised, nonlinear, and competing – temporalities enable and/or constrain transformative development pathways.
3) Materialities – scrutinising how material conditions of both the energy source itself and the required infrastructure condition and (re)shape imaginaries of possible energy futures; how materially bound, powerful energy visions can be disassembled to empower alternative futures?

9:15-10:45 (London)
Independent Paper Session: Public Futures

 # OurFutures
Erica Bol, Laurent Bontoux and Epaminondas Christofilopoulos

What do you want the future to look like? In which future would you like to live? These are questions of high relevance for policy and they were at the heart of the Conference on the Future of Europe. This year-long (April 2021-May 2022) EU initiative has created a new space for debate with citizens on how to respond to the European Union's challenges and to create the Union that its citizens collectively want for the future. However, beyond the formulation of many single wishes for the future, there is a need to structure these conversations and to build coherent and comprehensive alternative futures that are achievable. This can then provide a constructive space for political debate in the EU in a long-term perspective.

#OurFutures - Stories for the future of Europe addresses this need beyond the end of the Conference on the Future of Europe. It offers a simple questionnaire through an interactive multilingual platform able to cater to the 24 official languages of the European Union. It aims at collecting a large number of very short stories that express what participants would like to see in the Europe of the future (2040), with their hopes, their uncertainties and their ideas for a positive future. These stories, written by Europeans from all walks of life, remain anonymous. To ensure success, the project relies on a robust methodology (powered by SenseMaker©) to exploit, in a foresight perspective, the rich material provided by participants.

This methodology operates in all EU languages to maximise reach. To avoid any bias, the analysis bases itself strictly on what the authors themselves tell through a few simple questions. The stories, translated into all EU languages, are published on the platform of the Conference on the Future of Europe to maintain connection with participants and stimulate discussions. This is an ongoing project that will remain active for a long time to collect as much material as

possible. Results can be analysed per country, per age group, per policy domain or other classifications. Various types of responses can also be correlated to check whether certain values or preferences occur in specific combinations. The first analyses are very promising and the insights that they provide will serve to generate concrete, future-oriented recommendations for EU action to build together the Europe that its citizens want.

The purpose of this initiative is to provide a novel tool to empower Europeans to influence the creation of their own collective future. It does so by providing concrete ideas about desired futures as structured material that can be analysed to feed constructively the political debate.

Community scenarios for farsighted citizens: an experiment in primary school
Rocco Scolozzi, Ilaria Rinaldi, Luca Filosi and Marco Odorizzi

At what age is it useful to start promoting discourses about one's community, in terms of participation in the community life and personal contribution to desirable community futures?

With this question in mind, we developed and tested a protocol of scenario building workshops tailored for elementary school students. The proposed scenario building in classroom consists of a sequence of on interactive and imaginative activities that aims at promoting future-oriented discourses and engagement of students for their community in their role of young citizens. The premises of the workshop rely on recognition of importance of images of future in shaping reality: where the images of the future go, there the society

goes (Polak, 1973). Images of the future are essential for the survival of a society; projections about the future of society are related to actions and attitudes supporting social change (Bain et al., 2013). Besides, the feeling connected to one's future self, or future selves, seems to lead to discount the future less and helps people to make better decisions for themselves, such as healthier dieting and exercising decisions, and for community, avoiding ethical transgressions or decreasing unethical negotiation strategies. On the contrary, the tendency to live in the here and now, and the failure to think through the delayed consequences of own behaviour, is one of the strongest individual-level correlates of delinquency (Hershfield et al., 2012; Le Morvan, 2009; van Gelder et al., 2015). The mission of the school and the educating communities should be to train proactive citizens, capable of making their own choices and responsible for the qualities of their community in the present and in the future. This implies creating open futures of personal and collective fulfillment, connecting personal futures to collective futures, overcoming the dichotomy between optimism and pessimism, developing futures literacy and an anticipatory attitude (Bodinet, 2016; Miller, 2015). The promotion of futures literacy concerns the ethical development of society (Poli, 2011). Unfortunately, being proactive citizens is complicated, indeed increasingly difficult in times of growing uncertainty, in which society and individuals are tempted, or invited, to close themselves in "bubbles of the present" with poorly significant past, a fear of future and a present full of uncertainties. The construction of the scenarios is inspired by the qualitative method of "scenario planning", disseminated by the Global Business Network (Schwartz, 2012). In the proposed protocol, the two most relevant uncertainties (forming the quadrant of scenarios) are predefined and related to two aspects of coexistence in a community, the basis of citizenship: rules and collaboration. Thus, the four scenarios emerge from the combinations of their possible extremes: lack of vs. respect for rules, individualism

vs. collaboration. These four scenarios represent many real situations that we could distinguish between students' microcosm (family, peer group) and macrocosm (country-municipality of residence, valley, province, nation).

The workshop consists of about two hours of activity, with the following schedule: • Polak's game • Visualizing the four scenarios • Community positioning in the four scenarios • Strategic conversation Polak's game, inspired by previous experiences (Hayward & Candy, 2017), essentially consists of two questions: what the future will be like, what can we do, which are initially answered in silence only by moving in space. In the visualization of the scenarios, students are invited to represent the scenario assigned to their work group in a creative way, through drawings, improvisation sketches and short texts, freely chosen and shared in the plenary. In the community positioning, students place different coloured stickers in the scenario quadrant, referring to the position of their class group and their local community (neighbourhood or hamlet of the municipality) today and in 10 years from now. Strategic conversation consists of a collective reflection, drawing coloured arrows, on possible changes and actions, on which changes could change the position between the scenarios of students' class or group and students' community, and which individual and collective actions could help push reality towards the most desirable scenario. The initiative involved a total of 224 pupils and 16 teachers in 2020, 198 pupils and 28 teachers in 2021. The experience in the classrooms has allowed everyone to visualize a variety of scenarios, to contribute to a non-trivial discussion on individual choices and quality of local communities.

The results are interesting on several levels. The young participating citizens actively contributed to a shared reasoning on the variety of

possible and desirable scenarios, they developed their own medium-long term vision, overcoming the horizon of the present, in which to satisfy only today's needs. The experiences in the classroom allowed everyone to carry out an exercise of participatory foresight and to define their own position and possible role for the future of the community.

Speculative Design and Solarpunk Praxis as Tools for Empowering Communities: Experiences from Milano and Reading
Guglielmo Miccolupi, Laura Carolina Zanetti Domingues and Luisa Zanetti

Disadvantaged neighbourhoods and communities in urban and peri-urban settings are among the groups who stand to benefit the most from the promises of the just transition in terms of social and environmental justice and health and wellbeing benefits. A bottom-up approach to sustainable and inclusive urban living is key to delivering these promises, however, the material conditions of these communities are often characterised by insecure work and housing, time poverty and several immediate problems to be solved, coupled with lack of access to educational resources and safe spaces for creativity. Focused on the emergencies of the present, they are hard pressed to imagine a future which is not just a reproduction of the present crisis, and therefore are less likely to be able to plan it and implement it through bottom-up initiatives. Knowing that if you can't imagine a sustainable future, then you can't start to build it, we have implemented two projects to empower communities to take ownership of their future through speculative design and solarpunk praxis. The projects "Milano, Cartoline da un Futuro Possibile", conceived and realized by Commando Jugendstil and A.ME.LIN.C. Onlus, implemented by Punto.Sud, and co-funded by the European Commission

and Fondazione Cariplo, and "The Town That Could Be - A time travel journal from Reading 2045", funded by the National Lottery Community Fund via Transition Bounce Forward, focused on giving the communities the tools to understand sustainability issues and helping them imagine and implement their future through sessions of speculative design and visioning. We report on key successes and issues encountered through these projects, with special attention to the issues of digital exclusion cause by the forced reliance on virtual meetings during the pandemic and on the importance of community building through making.

Speculative approach for services: an integrated anticipatory approach towards inclusive social transformation
Zijun Lin and Beatrice Villari

As one of the most important goals of the 2030 Agenda for Sustainable Development, social inclusion is recognized as a goal, process, and outcome that needs to be pursued urgently. Gender Equality and Social Inclusion (GESI) is a process that addresses improving the ability, opportunity, access to livelihood assets and services for ALL, including the women, poor, and excluded, to take part in society (Cooperation in International Waters in Africa, n.d.; Gender Equality and Social Inclusion Working Group, 2017; The World Bank, n.d.). Many scholars and organizations stress that promoting such an inclusive social transformation process requires the active empowerment and participation of civics, especially marginalized groups, to build a more inclusive, sustainable, and just future (Alkire et al., 2004; Bai et al., 2016; Dugarova, 2015; Milojević, 2018; Sivaraman, 2020; Wong & Guggenheim, 2018).

Humans live within services and multiple social systems, which are all service systems (Fisk, 2009). In order to achieve Gender Equality and Social Inclusion, the inclusive transformation of social (service) systems is needed. Service Design is considered a transformative practice (Anderson et al., 2013; Koskela-Huotari et al., 2021; Kurtmollaiev et al., 2017; Sangiorgi, 2011) and an intentional pathway to promote the service system transformation (Patrício et al., 2018; Vink et al., 2021). For service system transformation, there is a need from designing for incremental change to designing for higher levels of the paradigmatic radicalness of transformation, to enable the disruption of fundamental assumptions and beliefs, and the exploration of radically new service futures (Koskela-Huotari et al., 2021).

To better cope with the complexity and uncertainty brought by the intersectionality, social (service) systems, and transformation to new service futures, redesign the service system inclusively and reduce service exclusion (Fisk et al., 2018), there is a need to introduce systemic thinking and critical future thinking to the Service Design process. In this context, the Speculative and Systemic approach demonstrate their potential for addressing social issues and promoting systemic social transformation (Auger, 2013; Jones, 2014; Mitrović, 2015).

The speculative approach in this paper refers to the design approaches that are considered future-oriented, critical, and discursive practice, including Speculative Design (Dunne & Raby, 2013), Critical Design (Dunne, 2005), Design Fiction (Sterling, 2009), Discursive Design (Tharp & Tharp, 2013), etc. The Speculative approach provokes new ways of thinking and problematizes ideas or issues into focus by envisioning or crafting imagination and visions of possible scenarios (Auger, 2013; Dunne & Raby, 2013; Mitrović, 2015). This

approach to envisioning futures could help citizens reflect on complex problems and long-term challenges bottom-up, imagine ways to address them, and develop a goal to inform collective actions in the present (Pereira et al., 2021; Ramos et al., 2019; Rana et al., 2020).

This paper draws a visual knowledge map through a literature review to show the state of the art of the research in relevant design approaches and anticipatory approaches to services and GESI, and to illustrate the relationship, gaps, and overlaps among them, identifying common concerns, complementary contributions, and gaps to be considered. The visualization map aims to provide a basic knowledge network and open up related discourses and discussions. Further, two case studies in two different contexts are described in order to discuss how the anticipatory approach will influence and be influenced by and what similarities and differences there will be in different contexts when designing services. A critical reflection on how the Speculative and Systemic approach might be better integrated with the Service Design process and the idea of future research agenda for service design research possibilities are suggested at the end of this paper.

9:15-10:45 (London)
Curated Session: Foresight methods from around the world
Prateeksha Singh and Daniel Riveong

The Challenge: The term 'decolonization' appears to now have become a victim of the buzzword machine. It is generously peppered in documents and discourses loosely and ambiguously across sectors and spaces, including in the futures community. As buzzwords often do, this rampant misuse runs the risk of diluting its critical mission.

The way we see it, decolonization reminds us to actively question and reflect on the origins of the ethos and epistemology underpinning present day fields of study, economic models, ways of doing, and - arguably the crux of it - our very imagination. But decolonization does not just stop there as a concept. It further asks us to actively identify and nurture a diverse way of thinking and doing, rooted in indigenous, place-based inspirations and plural worldviews.

When thinking about our futures- this becomes critical. We create what we can imagine. Our imagination is one of the most powerful tools we have as individuals and as a society.

There is a long list of global challenges that must be met by our collective imaginations of alternative futures. We must question the technological-based hegemonic narrative being imposed on our futures. We must alleviate the bifurcation of and polarization among different social and cultural groups. We must reimagine our exhausted, yet still dominant, economic models and even the very centrality of the economy in contemporary societies.

The Response: Given the urgency and magnitude of the many issues that surround us, we seek to contribute to their potential reframing and rethinking and ultimately, innovative addressal that draw from the wider imagination of communities around the world. The dominant underlying thinking and paradigms to most fields seem largely located in non-indigenous Global North frames, and they do not adequately center the context, knowledge, and imaginations of communities or non-western disciplines from around the world. There is a growing recognition if we want to even hope for different futures we need to first expand our aperture because we can't afford to operate under these outdated and myopic paradigms any longer.

In our research we have come to realize there is no singular place we can find an inspiring collection of ideas, thinking and methods from around the world that help us reevaluate and reframe current paradigms. We would like to change that by making it a bit easier for stand-out global futures methods to connect to an interested audience.

Our "The Futures methods from around the world" initiative is that attempt. Beyond what we may even be able to find, we realize most such applied methods will not be tagged or categorized as "foresight or futures", or even documented formally at the moment, let alone documented in English, so our initiative will be an iterative project that in each phase is part discovery, part support, part recognition and amplification.

We have launched a call for submissions asking for people to respond to the provocation:In what ways do you, your community, your culture think about something using a non-western lens that challenges its current dominant or 'mainstream' narrative and, in doing so, allows for the opportunity to radically rethink our possibilities for our future?

Our first milestone is to identify 10 methods from around the world, and then sharing this collective wisdom more widely and amplifying the voices of the people behind them - such as through this curated session. This initiative is spearheaded by Prateeksha Singh, a NGFP 2019 winner for her Lotus framework (a framework for practitioners who want to do equity-based anti-colonial, culturally sensitive and inclusive work in diverse communities) with members of the NGFP Sensing Network and support by the School of International Futures

(SOIF). (The NGFP's Sensing Network is one of the largest global networks of future-alert activists and practitioners globally.)

The curated session will be a space for us to amplify foresight practices and their authors that are emerging and unfamiliar to dominant strands of the foresight academia and foresight practitioner communities.

9:15-10:45 (London)
Techniques Workshop: Exploratory Sandbox for Experimental Governance of Blockchain Futures
Denisa Reshef Kera

Regulatory sandboxes in the FinTech and LegalTech domains have pioneered an experimental approach to regulating algorithmic services that supports participatory engagements of institutional stakeholders. We use the model of live testing under supervision to accommodate exploratory goals that involve a variety of participants in the full cycle of design, implementation, and regulation of blockchain services (from smart contracts to NFTs). The main goal of an exploratory sandbox is to support participants in negotiating the relations between code, values, and regulations on a concrete case. We will describe 2020 - 2022 examples, on which we tested the sandbox method, to discuss how this direct engagement with code and regulations supports anticipatory governance of blockchain futures, public futures and sovereignty. The key challenge in regulating algorithmic services is to engage citizens not only as test subjects or users of new services but as actual stakeholders in the future as something of a new territory with unclear sovereignty, political representation and participation. We summarized this as an issue of participation

and representation in the process of "algorithmization." The emerging algorithmic services present a similar challenge as any extrajudicial territory or transnational, intergovernmental, and supranational organization where "there is no overarching sovereign with the authority to set common goals even in theory, and where the diversity of local conditions and practices makes the adoption and enforcement of uniform fixed rules even less feasible than in domestic settings" (Zeitlin, 2017).

The sandboxes are sites that support this experimental or experimentalist approach to governance (Sabel and Zeitlin 2012) and emphasize the participation of stakeholders in the entire policy and design cycle from decision making to reflection and implementation. This is an iterative process with many risks and uncertainties, but it is essential that the regulation and policy include prototyping and design engagements with the stakeholders and thereby extend the discursive nature of the governance processes.

9:15-10:45 (London)
<u>Independent Paper Session: Anticipations in Action</u>

Trauma-Informed Anticipation: Realising the Triple Dividend and Socio-Economic Transformation by Addressing Adolescent and Youth Mental Well-being in Kenya
Steven Lichty

Youth and adolescents in Kenya and across much of Africa experience chronic stress due to high levels of poverty, unemployment, domestic violence, abusive home life, police harassment, and exposure to traumatic events such as violent crime, electoral violence, witness-

ing extra-judicial killings, and terrorism (i.e., youth being recruited by the al-Shabaab terrorist group based in Somalia). Evidence shows that the utilization of community-led trauma healing interventions oriented around holistic mental health and psychosocial support (MHPSS) approaches within these marginalized groups result in improved agency, social cohesion, and resilience among youth. This research project explores how these MHPSS projects among adolescents and youth can systematically address poverty, justice, and mental health-related dimensions of anticipation, and potentially influence a proactive engagement with their future. However, we do not know how these positive mental health results have an impact on youths' long-term livelihoods nor how trauma healing improves their futures consciousness and anticipatory capacities. This study will address this gap but also provide empirical evidence to support the Triple Dividend—a World Health Organization (WHO) concept that holds with increased investments now with adolescents (10-19-year-olds) on issues related to their health and well-being can yield a "triple dividend" of benefits that will transform 1) the capabilities of the current adolescent population; 2) their future trajectories of health/well-being into adulthood; and 3) their ability to increase the welfare of their own children, i.e. the next generation.

Between consultancy and advocacy: The politics of anticipating future regulation
Karl Palmås and Nicholas Surber

Since the 1990s, nanotechnology has served as the "jewel in the crown" of a new research policy regime (Johnson 2004), and as the paradigmatic technology that has spawned new ideas regarding anticipatory governance (Barben et.al. 2008) and responsible innovation (Shelley-Egan and Bowman 2018). Today, man-made nanomate-

rials are no longer a technology of the future – they are becoming staples of everyday life. Nevertheless, professionals within the field suggest that consumer and investor appetites for such materials are stifled by uncertainties regarding health and safety, as well as regulatory uncertainties.

This paper will explore the anticipatory practices of Swedish NGO ChemSec. While portraying itself as an advocacy organisation that was founded by the likes of WWF and the Friends of the Earth, it also fashions itself as a consultancy. Thus, in the context of the above-mentioned uncertainties, it provides a tool called the SIN ("Substitute It Now") List. This list contains a constantly revised inventory of chemicals and materials that are likely to become subject to future EU regulation. As such, they provide companies with foresight into which chemicals and materials that will become commercial liabilities in the near future.

Following previous research on how ChemSec sparked a debate among scientists about the politico-scientific merits of making such claims about the regulatory futures of carbon nanotubes (Surber et.al. 2022), the paper is based on qualitative data on how the NGO operates, how it construes its anticipatory practices, and on how other actors respond to them. Specifically, the paper focuses on how the NGO negotiates the tensions between consultancy and advocacy, and between prediction and performativity.

In so doing, the paper engages with recent historical research on how military think tanks have negotiated these tensions (Andersson 2018), as well as with recent anthropological research on how futurist consultancies are involved in similar negotiations. (Garsten and

Sörbom 2021) Nevertheless, the case of ChemSec represents an alternative situation, in which the agent of anticipation – an NGO – is pitted against a nanotech industry that holds significant economic and political power, in turn trying to influence another powerful institution: The EU Commission. As such, the paper seeks to engage with the second main theme of the conference ("Politics, Justice and Ethics of Anticipation"), specifically the issue of how power is wielded and negotiated in anticipatory practices.

Anticipating the Future of Education and Social Innovation
Susanne Giesecke

One of the most important challenges for our society today and in the future is how we view and organize learning and education. To respond to this challenge the European Commission, DG for Education, Youth, Sport and Culture (EAC) stimulated a debate in order to generate new, forward-looking policy ideas. A specific topic addressed is the likely future development and importance of social innovation in education. Within a specific study, future trends in education and supporting elements for the successor of the Europe 2020 strategy and the "Future of Learning" agenda should be investigated. This study was conducted by the Austrian Institute of Technology (AIT).

One significant result of this analysis is that the topic of social innovation in education neither has a clear definition nor an academic community or a community of practice to promote the debate. Accordingly, one of our first activities for the EAC study was to present a possible definition of the meaning of social innovation in education. Our definition is based on the recent discussion on social inno-

vation states that social innovations are new services that • involve 'non-traditional' educative actors (such as civil society, third sector, NGOs, social movements, social entrepreneurs and activists) • to address unmet social needs and societal challenges with regard to education and training, • provide better solutions in the field of education than practices used before did, thereby empowering people in assigning new roles, and creating social practices and structures, thus coming in control of their own educative undertakings.

The study used foresight methods such as horizon scanning, expert survey and scenario development to point out future opportunities and challenges for dealing with social innovations in, for and by education. In order to provide a vision of the future of social innovation in education, major trends and drivers with relevance to social innovation and education were identified. These diverse and numerous trends and drivers were then clustered and categorized according to the STEEPV scheme (social, technological, economic, educative, political, value-related). The trends were assessed by an online survey involving around 200 experts from different sectors and countries. Based on the outcome of their assessment, three scenarios and their corresponding implications for society, economy, and education systems have been developed and discussed.

Those trends and drivers with the highest uncertainty and the highest estimated impact were further explored in three depictive scenarios, supported by experts in a scenario workshop. The Scenarios are: 1: "Learning intensive society" 2: "Dichotomy of education in a polarized world" 3: "The Information-industrial complex"

Future Policy challenges at all levels for social innovation in education are to provide society with responsible citizens, better leaders and managers, better teachers and policy-makers and prevent pop-

ulist short-termism and the promise of easy solutions for complex problems. A crucial topic is that societal issues have to be brought into the classroom setting, and that the classroom setting – at least occasionally – has to move to challenging societal environments. Social innovation in education includes open-ness for a broad range of societal issues and for diversity – for classrooms of different ages, nationalities, ethnic backgrounds and different learning and locomotive capabilities. Changes toward more openness will provide more opportunities to acquire social skills, empathy and tolerance not only in the learning environment but also long-term. Social skills will thus provide society with responsible citizens, better leaders and managers, better teachers and policy-makers.

To develop policies for the support of building broad ecosystems for social innovation, based on networks integrating the various actors and stakeholders engaged in educa-tion, is the main challenge in politics. More mission-oriented politics, taking such a per-spective towards social innovation in building lifelong learning structures, could be an alternative to the traditional silo oriented political sectors focusing on the fragmented education institutions as well as to the neoliberal politics of competition, marketization and privatization based on the management practices of the private enterprise sector.

Slow Dance: Making Time for Anticipation in Ethical Relations
Michelle Kasprzak

This paper examines fieldwork conducted which examined how methodologies from contemporary art and design can be deployed in social innovation projects, particularly those which promote com-

munity participation and processes of working and making collaboratively towards positive anticipated futures. The fieldwork took place in the housing projects of Palmeira in Câmara de Lobos on the Portuguese island of Madeira -- one of the European Union's official "outermost regions".

I set out to investigate how the nexus of art and design methodologies, social innovation, and technology create concrete material possibilities and greater agency for small, remote communities. I instigated a series of artistic interventions using a wide range of methods and media into a community's social and physical setting in Madeira, and addressed aspects of cultural heritage and local history which are concealed or under-explored.

This research began by focusing on definitions of social innovation which emphasize social empowerment and process. In the literature, a discussion of the arts contributing to social innovation is surprisingly rare, yet my empirical knowledge as a curator and artist meant that I know how much artists contribute much to the social realm. There are tensions in the discourse around the true potential and scope of what we think of as innovation. Design scholar Pelle Ehn and colleagues note that there is "...a belief that innovation is getting democratized. At the same time, inventive as it may seem, this new paradigm is surprisingly traditional and managerial." As well, innovation studies scholar Saradindu Bhaduri remarks that key features of non-Western innovation, including networks of informal economies, are sidelined or ignored in the wider discourse. Is an engagement with social innovation by artists one method of putting the social aspect of social innovation at the forefront? Artists and designers have long had a role to play as engaged outsiders, providing what STS scholars Shapin & Schaffer called "stranger's accounts" of a

culture, disturbing the "self-evident methods" which take hold in every community.

Moreover, as any activist will tell you, any progress or gains made by any process of innovation must be closely guarded. This knowledge has led to the study of how progress is maintained or systems continue to work as a result of repair and care, and this is exemplified in the emerging field of maintenance studies. The narrative around inventions (whether they be objects or methods) should be expanded to accommodate a more in-depth history around their creation and maintenance. This narrative expansion provides a way to describe the innovation in maintenance and repair work (without indulging in a heroic narrative or other grand narratives about the inventors or the maintainers). There is an urgency to adjusting our view of how success happens and how infrastructures are built. There is also an urgency to becoming slow -- working with communities on a longer term towards building future imaginaries with them -- something I call "curating-with" (after Joan Tronto's "caring-with"). Continuously dismantling our propensity to assign a leader or give credit to a singular hero is in itself a kind of essential maintenance work. This kind of maintenance work to the narratives of social innovation, what I term an anti-heroic turn, is potentially transformative and can apply to other fields. This paper explores this territory and its relevance to the practice of futuring.

11:00-12:30 (London)
Curated Session: Challenges and opportunities to develop critical anticipatory capacities in international organisations
Monica Mendez, Marius Oosthuizen and Emily Munro

In 2021, UN Secretary General presented 'Our Common Agenda' Report with the ambitious goal to "forge a new global consensus on what our future should look like, and how we can secure it." Having the long term in mind, the report recommends actions to build anticipatory capacities within the global population, especially young people, through Futures Labs, and a 2023 Summit of the Future, among other mechanisms.

The Agenda also set immediate steps to strengthen the UN system's critical anticipatory capacities, such as through the regular issuing of a Strategic Foresight and Global Risk Report to be better prepared to prevent and respond to major global risks.

While these developments demonstrate that futures is now becoming a key concept at the highest level of international governance, there is still a gap requiring to be filled among people within institutions to become Future Literates in order to take advantage of the opportunities that are to be found amidst the challenging times and crises we are experiencing.

In relation to this, it is crucial to explore the role of international institutions in fostering capacities for anticipation and for critique of anticipatory work. Some questions to discuss are:

- How to articulate the different approaches for 'using the future' as futures thinking, anticipation and foresight in these settings?

- How to tailor better the educational and operational programs within organizations to fit the needs of the communities served at global, national and local levels?

- What mechanisms are available or would be easier to develop to bridge the potential gap between North-South in the global arena?

11:00-12:30 (London)
Independent Paper Session: Critical Anticipatory Capacities

A New Foresight Competence Progression Model
Erica Bol and Laurent Bontoux

Policymaking, the profession at the core of the activities of the European Commissions essential to create the future we want, is undergoing substantial changes. The increasing speed of change, especially linked to technological developments, the unavoidable transition due to the climate crisis, the increasingly complex geopolitical situation, the disruptions caused by the coronavirus pandemic, an ageing population and other global trends call for a highly competent community of civil servants and policymakers. In this context, the European Commission aims to be at the forefront of excellence in policymaking worldwide. This requires having the capacity to anticipate, develop, implement, monitor and evaluate policies and to do so in an evidence-informed, transparent and collaborative way. In response, and to achieve the competence required, the European Commission has launched the EU Policymaking Hub in March 2020. This hub offers a platform for policymakers to learn, collaborate and share knowledge in EU policymaking, and a new range of trainings on the skills that great policymakers need throughout the policy cycle and across roles. At the core of this offer, the European Commission has developed a competence framework to provide detailed descriptions of all key competences required for state-of-the-art policymaking and useful career guidance instruments for the development of the competences of European civil servants. This work, anchored in a vision for policymaking derived from the values of the EU project, is inspired by the EntreComp model (European Entrepreneurship Competence Framework). It describes four levels of pro-

gression for each cluster of skills: Foundational, Intermediate, Advanced and Expert. The framework captures and unpacks groups of competences from a policy perspective in the areas of advising, innovating, working with evidence, being futures literate, engaging with citizens and stakeholders, collaborating, and communicating. Regarding futures literacy, the competence progression model addresses on the one hand the capacity to anticipate change, and on the other hand the capacity to engage in foresight by spotting change, understanding change and its possible impacts, and orienting change. For each level of competence, the progression model not only describes the level of skill required, but offers also indications on tools and methods that should be mastered. A training applied to the use of foresight in policymaking has also been developed.

Biases. A non-method for the Anticipation
Ami Licaj, Simona Colitti and Valeria Piras

The proposal aims to critically analyse the practice of anticipation, starting from what have been the critical issues found in the currents of design that have used this approach, such as speculative design or critical design and identifying how the problems of these approaches are mostly in the cultural bias of the designer. Starting from this analysis we want to propose a possible design framework, for a better use of the anticipatory method, based on three paradigms: Design for Pluriverse, Horizontal thinking and Collective thinking. The construction of this framework is the result of specific projects and educational courses carried out at the Design research groups of the Department of Architecture and Design in Genoa and the Advanced Design Unit of the Department of Architecture in Bologna.

Constructing fair and flourishing futures – transformative policies for living in crisis-resilient spaces

Sirkka Heinonen, Joni Karjalainen, Amos Taylor and Saija Toivonen

We are already living in the VUCA world. A world with rapid changes - full of volatility, complexity, uncertainties, and ambiguity. Nurtured by the VUCA soil, both creeping and sudden crises are accumulating. After the financial crisis started in 2008 we have faced the triple crises of Fukushima earthquake/tsunami/nuclear accident in 2011, the COVID-19 pandemic in 2020, and the Ukrainian war in 2022. The downward cycle of ever accumulating crises should now be counterbalanced with ever strengthening crisis awareness, crisis preparedness and crisis resilience. Here, futures studies, foresight, and anticipation can and should help address the imagery of a sustainable post-pandemic world (Giurca et al. 2022). It is their responsibility to influence the ways futures are imagined, visioned or, and depicted as narratives - but above all for making a better world for humans and all living species. (Bell 1997). Futures literacy (Miller 2011; 2018) must embrace crisis awareness and preparedness as a key element.

Futures hang upon us heavily. Not only is the present pregnant with futures (Poli 2011), but the future is pierced with the present. The present being pregnant with the future reveals the capacity of us humans at the present day to make decisions that will formulate the future, embedded in our visions, presumptions, expectations, aspirations, and decisions today. The future being pierced with the present reflects the same interlinkage, but focuses on the ultimate creation of futures. Here, especially the questions around the futures agency become relevant. Who owns the future? Who rents the future? Who discounts the future? Who occupies the future? These issues are re-

lated to the classical thematique of colonising the future (Inayatullah 2008; Ramos 2005). Futures have become an ethical and political territory. A compelling question for agency is: Who makes the futures flourish for all? Let us avoid segregation and gated communities both in urban planning and in anticipation of preferred futures.

We apply the metaphor of constructing the future as reflected to our interest of study – the built environment. Constructing cities worldwide, as urbanisation, is a megatrend that has a huge impact on nature, on the use of natural resources, as well as on our health, wellbeing and equality. Digitalisation is transforming the urban space in a profound manner (Ferreira et al. 2022). Such progressions are often taken for granted and their impacts are too often detrimental. Consequently, we should be addressing and modifying the built environment (land and space use) both as a rescue for us in various crises – and as sources of health, wellbeing and wealth on an equal basis. Anticipatory governance (Heo & Seo 2021) can boost crisis preparedness. In many countries the public sector steers land use planning as part of their chosen land use policy (Behrend 2017; Fernandes & Chamusca 2014). Therefore, the role of the public sector is crucial when determining the resiliency of urban environments. The values, views and expectations they favour are reflected via land use plans and building regulations into the creation of future cities and their characteristics (Yrjänä et al. 2018).

Our inquiry is accordingly focused on the kinds of governance, and related regulations would be needed to make cities resilient? What policies would have to be changed and how should they be framed (Wardekker 2021) for them to become truly transformative for this purpose? Transformative policies are needed because of the ever-changing interplay between the built environment and the society and its different phenomena including a variety of risks and future

crises (Toivonen & Viitanen 2016; Masik & Gajewski 2021). In addition, many different actors are involved in the built environment scene such as households, companies using retail and office space, developers, investors and financiers. They all have strong and at times even contradictory aims, hopes, and fears concerning the future development (Innes & Gruber 2005; Lawrence 2000; Toivonen 2011). Therefore, also potential barriers and incentives for promoting successful crisis preparedness are being sought for. We look for suggestions for concrete policy actions and recommended practices that would promote actor involvement, equal power relations, and collaboration, and as a result enable community empowerment toward resilient urban environments (Rashidfarokhi et al. 2018). The ultimate goal is to explore possibilities for providing urban space that is crisis resilient, prone for healthy living and wellbeing, enabling a fair living model for all. We do not want a crisis resilient 'urban farm' where some lots are more resilient than others, we seek a comprehensive approach. On the other hand, the resilience of a city might be based on the idea that some parts/properties of the city are built to be more resilient than others, but in case of emergency access for all.

We use empirical data from a set of futures workshops conducted for identifying possible crises and by analysing possible direct and indirect impacts within the RESCUE project. Identification of policies needed will be made within a Futures Clinique with several stakeholders in the real estate and construction field. As case studies we have three different urban contexts from Finland – 1) Tripla, a Metropolitan development combining culture, residences, retail stores, business and transportation within a mall complex, 2) Kotka, a pioneering coastal town with proactive crisis anticipation capacity, and

3) a northern town Rovaniemi, experiencing heavy losses in tourism, one of its main industries, due to the pandemic and Ukraine crisis.

This paper discusses how power is manifested in current urban planning processes and how it could be better shared. It also probes how anticipatory practices could enhance the inclusiveness of city planning. The topic of time and temporalities is also very relevant here - the built environment is constructed for several generations. How could the voices and needs of future generations be considered? How the built environment that is aimed for crisis resilience has endurance for diverse future crises that might be of totally different, even unimaginable nature. Such questions will be tackled in light of the data from futures workshops on crises, evaluation of the crisis resilience of the three case studies mentioned above, adding up to the futures dialogue from a Futures Clinique.

«Mental landscape» Method as a Tool for Anticipation and Creating Innovative Products
Galina Lola

The present paper focuses on the method for designers developed by the author. It's an experimental approach to designing innovative products. It should help bring harmony between logical thinking and imagination. The paper focuses on the influence of a time model on the creative consciousness and lists the requirements to the conceptual framework that would help anticipate the future.

11:00-12:30 (London)
Curated Session: Responsible Futures

Fabrice Roubelat, Ted Fuller, Judit Gáspár, Narcis Heraclide, Jamie Brassett, and Anne Marchais-Roubelat

"How might we reveal ways in which practices of responsibility for the future are enacted?" The proposers and panelists for this curated session are currently participating in a project called "Responsible Futures". These are drawn from a special interest group of around 30 people that has formed to share in a study of responsibility in the processes of foresight and anticipation. The purpose of this is to understand and develop meaning and to shape practices as a result. Practices refer not only to specific futures-oriented thinking (e.g. foresight projects) but to future-creating activities, such as enterprise, activist movements and governance. The concepts of "responsible foresight" (Tonn, 2018, Van der Duin, 2019) and of "responsible futures" (Arnaldi, Eidinow, Siebers, Wangel, 2020) has emerged in futures literature. The focus of the initial programme is motivating contributions that (i) articulate a conceptual basis for the study of responsibility in the processes of foresight and anticipation and/or (ii) identify forward-looking examples of future-making in practice which address global challenges (such as the Sustainable Development Goals) to use as living laboratories in which practices of responsibility can be revealed. Anticipatory systems (AS) have an ethical dimension. In his treatise, Robert Rosen remarks that "The character of a predictive model assumes almost an ethical character even in a purely abstract context. We might even say that the models embodied in an anticipatory system are what comprise its individuality; what distinguish it uniquely from other systems" (Rosen, 2012, p 370). Relationality appears to be an important principle of Rosen's AS and of matters of responsibility. The responsible stance of the futures field addresses many facets of responsibility, Including the issues of values, ethics, morals and of sustainability. The issue is to un-

derstand that anticipation is an act of responsibility and has an ethical character. Our discussion in this curated session may surface ethical characteristics inherent in types and forms of Futures Studies and in everyday futures thinking and futures-making. The group has been developing connected conversations since June 2021, and continued these. An edited book and other spin offs are expected.

11:00-12:30 (London)
Curated Panel: Towards shaping futures literacies by designing
Andrew Morrison, Manuela Celi, Oscar Tomico and Betti Marenko

In this curated session we discuss a practice based pedagogical funded futures literacies project centred in four leading design universities in Europe. We do so to extend notions of futures literacy (Miller 2007) within an emerging frame of anticipatory learning and action (Inyatullah, 2006; Facer, 2011). This we present in shift of anticipatory framings from futures literacy (with a futures view; Miller 2007, 2010, 2018) to futures literacies (located in critiques in the learning sciences, situated, agentive; Amsler & Facer, 2016; Gidley, 2016; Morrison et al., 2019) to design futures literacies (hybrid, multimodal, ecologies, designerly; e.g. Snaddon & Chisin, 2017; Snaddon et al., 2019, Morrison et al., 2021; Marenko, 2021). Two recent elaborations on futures literacy both stop short of engaging with how creative-critical exploratory and risky acts of coming to know by making, through designing, ought to and may be part of shaping futures literacies. Poli (2021) has argued (with an underlying focus on science).that relations between elements of futures literacies are intricate, and need to be futures located in a world as an unfinished process He holds that '... authentic futures are embedded in dawning, unfolding events' (Poli 2021: 7) that need aspiration. Poli proposes a multi-part typology to pattern these for improved under-

standing, optimisation and action in different ways of being and becoming through building radical novelties in spaces in the present as a mode of anticipation to 'reopen' the future in the present through hope and action. Facer and Sriprakash (2021), oriented towards education and anticipation, have characterised approaches to futures literacy as being beset by a move to codification centred on technical expertise, championed by UNESCO, and embodied in Miller's compendium Transforming the Future: Anticipation in the 21st Century (2018), around universal views on using the future to effect change in the present. Proposing a provincialisation of futures literacies to face power relations and struggles, Facer and Sriprakash motivate for a plurality of ways to bring the future into meaningful presents, to time and place, - reflexively, with curiosity and historicity, decolonising through alliances - and through a range of modes of knowing, ideas and positionings as students and teachers in changing organisations and institutions. With co-emergence and care for the future central, (Osberg 2010), it is through collective inquiry and co-emergence that ontological futural educational change may be realised (Facer and Sriprakash, 2021: 8).

In our work we have outlined ways design futures literacies may be situated, in mode of becoming and negotiating power, with a wider frame of anticipatory design (Zamenopoulos & Alexiou, 2007; Celi & Morrison 2017; Morrison et al., 2021). We conceptualise extending literacies and futures relations, transdisciplinarily and methodologically, to include perspectives on multi-literacies (Cope & Kalantizis, 2015), multimodality (Morrison 2010), multi-sitedness and digital living (e.g. Estad 2015) and cultural plurality (Appadurai, 2013; Escobar, 2018) and diversity of design domains and practices. Taken together, we term these 'Design Futures Literacies' (Morrison et al. 2021). In the session we will elaborate on what and how we under-

stand these to be conceptually, pragmatically and pedagogically in the contexts and challenges of shaping futures education by design and design education through futuring (Candy & Potter, 2018). We have addressed this through the development and implementation of online learning resources in the FUEL4DESIGN (F4D) project in terms of design centred explorations and reflections on higher education masters and doctoral design students and educators involvement since September 2019, and mostly, due to the pivot to digital means, we have explored the uncertain, unfolding, changing and risky negotiations of productively and critically enacting design futures literacies online (Dudani & Morrison, 2020). Drawing on earlier situated pedagogies (studio, street, corporation, community etc) we frame these as dynamic, flexible, situated and emergent performatives made of intersecting 1) capacities and competencies, 2) fluencies and articulations, and 3) what we term 'vibrancies' or engaged, aspirational acts of emergent, situated knowing through design.

Here we invite participants to join four thematic roundtables (15 mins + 10 mins discussion) with follow up via the project website and an open access e-book launched at the event.
1. Anticipatory Designing: Two items are covered. a) World views, process philosophy, Deleuzian dynamics, criticality and positioning. The Future Philosophical Pills (FPP), as a design 'pharmakon', are a curated set of philosophical insights, concepts, ideas to use to think about futures. b) The Design Futures Lexicon (DFL): relational vocabularies, situated uses, semantic emergence, wordplays, connecting, developing vocabularies, contextual uses and re-framings. 2. Altering Design Pedagogies: Critiques of institutional and predomomnent design/futures pedagogies, existing and new tools and situated methods (design, humanities and social sciences). Experiential, situated, hybrid and design work in developing alternate pedagogical

presents, close critical uses and annotations of core main futures tools in design projects, co-creation of teacher resources around methods and futures in shaping relations between pedagogies and design centric futures. 3. Changing Design by Making: Focus on digital platforms and tools in experiential, non-representational learning: spatial uses of Miro prevalent in much design based 'pan/demic pedagogy', presence/visibility, student productions, annotation, and critical reflections on changes or repetitions of prior F2F pedagogies and weak signals. Addresses the changing nature of futures where the temporal and spatial, social and political, economic and ethical are increasingly entwined. 4. Designing Otherwise: Opening out and positioning futures literacies in relation to global south perspectives in designing otherwise and the context of decolonising design): Philosophically, conceptually and discursively, socio-materially, with positioning key propositions, potential directions. With possible projections via a Manifesto for Design Futures Literacies as prompts for actions in the present.

11:00-12:30 (London)
Curated Session: Tangibilizing "Future Frictions" for Responsible Futuring in Smart Cities
Julieta Matos-Castano, Corelia Baibarac-Duignan, Anouk Geenen, Cristina Zaga, Mascha van der Voort and Sabine Wildevuur

Smart Cities call for Responsible Futuring

This workshop invites participants to engage with an immersive web experience called 'Future Frictions' to reflect on and debate about smart city futures. We aim to gather reflections on how tangibilizing futures by using a web experience stimulates ethical reflection and debate about the impacts of technology on cities, to activate desirable smart city futures.

Smart cities use technology to collect, analyze and apply data on activities with the intention of improving urban life (Vanolo, 2016). Although technology offers opportunities for optimization like an improvement of traffic flows or more efficient waste management, it also impacts urban life and society in (sometimes) unintended ways. Often, smart cities give rise to societal challenges. For example, how to safeguard citizens' privacy and freedom in increasingly surveillance-led smart city projects? How to launch initiatives that ensure a fair and transparent control of technology? In essence, smart cities can be controversial (Baibarac-Duignan and de Lange, 2021). The responsible development of smart cities requires forms of engagement that support ethical reflection on the impacts of technology, and bring together a diversity of stakeholders to establish constructive dialogues about desirable smart city futures. This way, controversies can come to the surface to explore how prioritizing certain values in smart cities can ultimately impact our everyday lives, now and in the long term.

Smart cities, therefore, pose societal challenges that call for transdisciplinary collaboration, to engage stakeholders in processes of 'Responsible Futuring'. Responsible Futuring is an approach developed at the DesignLab of the University of Twente to address societal challenges and co-shape responsible futures. Starting from societal challenges, Responsible Futuring offers an approach to establishing dialogues to reflect on the social implications of our actions, putting at

the center transdisciplinary collaboration, ethical reflection, and the exploration of potential futures to make informed decisions in the present.

Tangibilizing smart city futures with Future Frictions
Imagining and ideating potential futures is one of the main pillars of this approach, having 'tangibilizing' at its core. Tangibilizing or 'visibilizing' (Matos Castaño et al., 2020; Schoffelen et al., 2015) revolves around making abstract concepts (like the impacts of technology on society) tangible to support reflection and constructive transdisciplinary collaboration. In this context, speculative design (Dunne and Raby, 2013) or experiential futures (Candy et al., 2017) provide tools and techniques to bring abstract notions of potential futures to the present to provoke and reflect on our current practices and choices.

In this context, our workshop proposes 'Future Frictions' as a creative means of engagement. Our goal is to activate desirable smart city futures by stimulating ethical reflection, becoming aware of a diversity of values, and debating the impacts of technology on society. Future Frictions is an interactive, digital, and scenario-based tool developed as part of the 'Designing for Controversies in Responsible Smart Cities' research project. This 15-minute web experience immerses participants in a neighborhood where they can interact with residents and witness relatable urban activities. At different points in time, participants encounter smart city technologies, and they are asked to decide on the use of the data collected by these technologies. These decisions are controversial, provocative, and intentionally ambiguous to make participants doubt their initial choices and thus become more open to other values different than theirs. After making decisions on the use of these technologies, participants experience the effects of their choices, by watching firsthand how the

neighborhood has changed, as well as the interactions between and with residents.

The outcomes of the workshop will help us to further develop the Responsible Futuring approach, as well as further test Future Frictions to explore its role in stimulating ethical reflection and debate.

13:00-14:30 (London)
<u>Curated Session: Collecting transformative approaches and methods to feed our imagination, and to cultivate our abilities to use the future</u>
Sanna Ketonen-Oksi, Minna Vigren, Mikko Dufva, Liisa Poussa and Terhi Ylikoski

In these increasingly unprecedented times, it is important to challenge the old, and to imagine and experience alternative futures. Several anticipatory methods have been developed to facilitate this. In this curated online workshop, we aim to collect, review, and discuss these methods from the viewpoint of agency creation.

Imaginaries have a fundamental role in our contemporary society, in the ways how we subjectively imagine, represent, produce, and consume the future (Selin et al, 2020). In a society with no imagination, there is no room to organised criticism or opposition, let alone the possibility to hold the possible abusers of power accountable (Huxley, 1932; Jasanoff, 2015). Imagination does not only bring forth possibilities but supports good decision-making and good governance in the present.

Whether we want to address the pressing sustainability challenges, or to take a stand against the uncontrolled political power of the internet giants, we need new alternative ways of seeing and reasoning. It means encountering our ignorance and giving space to new collective narratives about who we are and from where have we come to this. To embrace these plural futures, we must start by challenging the already existing worlds, constituted by our historically situated imaginations (Appadurai, 1990).

As many of the traditionally used scenario development, communication, and deliberation formats have been found incapable of creating human-centred empathic engagement with the futures they imply for (Garduño García & Gaziulusoy, 2021), alternative approaches and methods have emerged, including experiential futures (Dunagan et al, 2019), terrestrial thinking (Latour, 2018) and the broken world thinking (Jackson, 2013). Importantly, significant new knowledge and understanding has been acquired about the values and belief systems affecting our imagination (Schultz, 2012; Milojevic and Inayatullah, 2015), the role of imagination to human cognition (Miloyan et al, 2019) – and the limitations of these capacities (Kegan, 1980; Rosen, 1985; Markham, 2020).

Besides distinguishing the layers of cognitive and social processing that inform the possible anticipatory work for individuals and groups (Finn & Wiley, 2021), more attention is needed toward designing context-specific circumstances or situations in which the collective intelligence and imagination of communities can flourish (Hayword & Candy, 2017; Miller 2018). Or, to the conscious awareness, curiosity and tolerance of doubts and ambivalence toward what provokes imagination. In other words: What are the already existing approaches and methods that can be used to strengthen our

collective capacities to imagine alternative futures? How to create agency with transformative impact on our ways to use the future?

The workshop builds on an integrative literature review (a work-in-progress by Ketonen-Oksi and Vigren) that aims to collect and make sense of methods used to enhance our ability to imagine alternative futures with transformative impact (Inayatullah, 2022; 2004; Minkkinen et al, 2019). The review provides up-to-date academic knowledge and analysis about the yet rather fragmented understanding of the ways how our imagination rests on the proactive assumptions (Rosen, 1985; Poli, 2014; Fuller, 2017) that result from its use, and of how to create agency that pushes us to challenges the currently dominant normative hierarchies. For example, it seems that the humanistic and social science discourse are almost non-existent, the methods are approached without an in-depth reflection on their long-term impacts, and that only little critic is found in terms of the ethics, purpose, and quality of the used methods. The data is drawn from three major databases and academic journals in the fields of futures studies.

At the same time, we acknowledge the great number of prior synthesisations of approaches and methods for creating spaces for imagination (e.g., Wu, 2013; Johnson,2011; Candy & Dunagan, 2016), and that a lot is happening in the field right now – from which the theme of the conference, the study of anticipation to new voices, is a good example of. With this in mind, we aim to bring together the participants of Anticipation 2022 to identify, discuss, reflect, and share their knowledge about the related lesser known, emerging, or ongoing work that cannot (yet) be found from the literature.

13:00-14:30 (London)
Independent Paper Session: Critical Technology Futures

Artifacts and frames in socio-technical anticipation: The case of responsible AI
Matti Minkkinen, Matti Mäntymäki and Markus Philipp Zimmer

Over the past decade, anticipation–using images of the future in the present–has garnered increasing attention from researchers and practitioners (e.g., Groves, 2017; Louie, 2010; Miller, 2018; Poli, 2017). Promoted as the latest generation of futures studies after forecasting and possibilistic foresight (Poli, 2017), the anticipation concept brings together researchers, policy planners, consultants, designers, and other future-oriented professionals. Anticipation takes place in a changing socio-technical environment, where technological fields such as artificial intelligence (AI) and big data analytics provide new ways to "use the future" (Miller, 2018) for professionals and laypersons alike. New and emerging technologies promise novel opportunities and bring new risks, such as unintended opaqueness and biases in the case of AI. Hence there are increasing calls for responsible innovation (e.g., Dignum, 2020).

In addition to the challenge of responsible innovation, the ubiquity of technological artifacts challenges anthropocentric approaches to anticipation. The current anticipation literature and foresight practice usually conceptualize anticipation as a human capacity and process. Early theorizing on anticipatory systems derives from theoretical biology and applies broadly to biological systems (Louie, 2010). Nevertheless, human anticipatory capacities and processes have been the focus of the anticipation field (e.g., Heo & Seo, 2021;

Miller, 2018). Anticipation is primarily theorized as a process involving future-oriented prospection and action based on it (Poli, 2017, p. 1). However, recent work on anticipation suggests an expanded framing: anticipation as a metacapability achieved by systems rather than individuals (Groves, 2021).

In our study on the European responsible AI discussion, we claim that anticipation is not only human but also involves technological elements and affordances (Groves, 2017, 2021). Groves (2017) argues that anticipation comprises "material capacities, technological, bio-physical and affective in nature," making specific forms of agency possible. These capacities are distributed throughout the environments of human actors. Our paper investigates the interplay of technological artifacts and human frames of reference in anticipation. In the emerging literature on anticipation, the role of technological artifacts is central and thus far under-theorized.

To understand human frames of reference concerning technology, we employ the concept of technological frames, referring to the interpretations that people develop around technology and its applications and consequences (Orlikowski & Gash, 1994). Alongside technological frames, we consider foresight frames, understood as people's interpretive structures that direct their approach to anticipation. One of the authors has proposed six foresight frames (predictive, planning, scenario, visionary, critical, and transformative), which differ in perceived unpredictability and aspired agency to influence the future (Minkkinen et al., 2019).

We bridge technological frames and foresight frames by using the concept of expectation work, defined as "the purposive actions of actors (e.g., individuals, groups, or organizations) in creating and negotiating expectations" (Minkkinen et al., under review). Even

though human actors conduct expectation work, the technological artifact has a crucial role as the focal element of technological frames (Minkkinen et al., under review).

Using this conceptual framework, we study the European Union's (EU) recent responsible AI strategies and stakeholder responses to them. Responsible AI refers to AI that is designed and used in accordance with human values, such as transparency and accountability (Dignum, 2020). In recent years, the EU has positioned itself as a central player in striving for responsible AI (e.g., European Commission, 2020). Our empirical material includes document material (key EU strategy papers) and expert interviews on the EU's responsible AI approach.

Our main argument is that anticipation promoting responsible AI requires appropriately designed technical artifacts as the necessary condition, while the sufficient condition is provided by the social component, namely stakeholders' technological frames, foresight frames, and expectation work. Thus, our study theorizes technical artifacts and anticipatory frames as crucial for anticipatory processes. The study has implications for anticipation scholars, policy planners, and AI system designers, who can consider the context of responsible AI as socio-technical systems embedded in future-oriented frames of reference.

Our study contributes to the conference theme of Politics, justice, and the ethics of anticipation. We illustrate how power is wielded and negotiated in anticipation by investigating the interplay between actors' frames (EU actors, experts) and technical artifacts (affordances). Moreover, our study contributes to understanding how

anticipatory regimes produce governance because responsible AI is about governing AI systems according to human values. Our research also elucidates the worldviews, principles, and practices involved in anticipation by considering key actors' frames of reference. In addition to the politics of anticipation, our study clarifies infrastructures that promote anticipatory capacities by investigating the role of technical artifacts (responsible AI systems) as infrastructure that shapes anticipatory frames.

Lively Media Technologies, Monsters, and New Imaginaries for the Future

Line Henriksen, Bo Reimer and Bojana Romic

We are living in times of insecurity and risk. We are also living in a media society, where we need the media to help us make sense of our times. However, the contemporary media landscape is weird and illusive. It is argued that technology and the media are bringing us into an age of "surveillance capitalism" (Zuboff 2019), or even into a "dark new age" (Bridle 2018). However, it is important to not fall into the trap of painting too simplistic portrayals of extremely complex processes; we should not fall into too simplistic true/false, reality/illusion dichotomies.

British cultural theorist Mark Fisher (2016) reminds us that the "weird" may a be sign of that we are in the presence of the new, and a signal that the concepts and frameworks which we have previously employed are obsolete. In other words, a weird media landscape contains possibilities for making sense not only of the present but also of the future. But in order to make these possibilities real, we need new ways of thinking, and conceptualizing.

The purpose of this presentation is to discuss possibilities of rethinking and reconceptualizing the relationship between the current media landscape – its content and processes – and its inherent potentialities for helping us in thinking the previously unthought, and in seeing the previously unseen.

The concept of imaginaries, social and sociotechnical, will be central. As Jasanoff writes, these are "collectively held, institutionally stabilized, and publicly performed visions of desirable futures" (2015:4; cf. Castoriadis 1975/1987; Taylor 2003). To a great extent it is in the media we find the impulses and inspirations for these imaginaries.

We will also turn to the figure of the monster. Recent years have seen a turn to this figure and to the concept of the monstrous when it comes to popular depictions of digital technologies and creations. Examples are depictions of the development of AI as potentially overthrowing their creators, as in films such as "Ex Machina" and "I am Robot", and the creation of Twitter bots pretending to be humans. We argue that the turn to the monster in popular – scientific and artistic – depictions of digital technologies indicate cultural anxieties concerning technological developments, which it is crucial to take seriously and address, but also to challenge. In popular culture, the monster is normally regarded as a negative boundary-creature that threatens to undo the structures we rely on to understand our surroundings. Yet, this undoing of normative categories can also be regarded as promising (Haraway, 1992), even hopeful (McCormack, 2015); taking the figure of the monster and its fraught relationship with its creator seriously may open up for other imaginaries. In the upheaval caused by the monster lies the potential for change and transformation.

We will furthermore use the concept of hauntology. Coined by Derrida (1994), the concept is a play on the words 'ontology' and 'haunting'. Hauntology applies the figure of the spectre in order to rethink ontology through haunting, thereby accommodating the aspects of reality that are not straightforwardly present and immediate, but instead have a haunting present absence; we are always haunted – both by the past and by the anticipated future. Derrida argues that communication technologies produce such present absences as they replicate and circulate images, sounds and text. Despite intriguing hints, Derrida did not theorize the internet through hauntology, and though some scholars have since attempted to do so (Fisher 2014; Blackman 2019), the full extent of how hauntology can help us conceptualize and theorize what it means to live in times of spectral, digital systems is yet to be explored.

In the presentation we will discuss ways in which the proposed conceptual framework may help us to rethink our relationship to the media and the future, but we will also discuss how such a framework may be relevant for the field of Anticipation Studies. We will furthermore propose new methods based on creative writing for rethinking and retelling stories of future co-existence and companionship with techno-monsters (Henriksen et al. 2021).

Design Fabulations on the Transcorporeality of Menstrual Care and Sphagnum Moss
Marie Louise Juul Søndergaard

This paper presents a project exploring how caring for the menstruating body can also become an environmentally nurturing practice. The project spans from the design of biodegradable menstrual pads

made of sphagnum moss, agar agar bioplastics and gluten, to wider design experiments with attending to mosses through visual tools. Through material and embodied practices, the project speculates on the transcorporeality of menstrual care and sphagnum moss as an anticipation into futures of climate crises and reproductive rights. Situated in speculative design and feminist posthumanities, the paper contributes with (1) an anticipation of the transcorporeality of human and environmental health, and (2) design fabulations as a creative and critical approach to material and embodied futures.

Lithium exploration, culture and science: battles between past futures and imagined mined futures

Emilia Araujo Araújo and Sofia Bento Bento

Called as "oil of the future", lithium is a powerful and unavoidable structural element of the economy and society we are building. Existing studies on lithium production worldwide have highlighted several areas of debate on the chain of issues involved in the exploitation, use and potentially contaminating effect of lithium, even after its use in car batteries. Despite these studies, many and diverse questions persist and grow, especially in recent years, both about what lithium is and what it is used for, and about the effects of its exploitation and extraction on the populations and territories involved. As it happens in many places, in Portugal the governments have been facing several resistances from the populations living in places where lithium mining is or will be operating very soon. This resistance is based mainly on the argument of "loss" and "theft of the future", due to the transformation of landscapes, reconfiguration of sectors of activity and fear of contamination of water, soil and air in the medium and long term and also on the argument of low participation of local people in this whole process which is supported by a

political discourse based on the contribution of lithium mining to achieving European convergence with a "clean" energy future. But why do local populations react so negatively to its exploitation and how does this resistance or refusal reveal past futures and also imagined and unwanted futures? How do technical and scientific undertakings cause disruptions and crises in people's identities and how can governmental actions respond to these past futures?

These are some of the questions that guide this communication which, using mainly content analysis, presents the results of a study on the visions of the future and methodologies of anticipation included in the controversy over the exploration of lithium and its intense and complex network of socio-technical and political meanings. By temporally tracing the controversy around its exploitation and use and making explicit the main visions of the actors most directly involved, the communication highlights the value attributed by the populations to the future, through a theoretical discussion that contemplates the deepening of the concept of anticipation analysed, fundamentally by seminal authors in the area of sociology and anthropology of time, in particular Bourdieu, Appadurai and Koselleck, who perspective the place of temporality in sustainable development. Assuming that these are processes that imply strong impacts on the national and European collective future, four main ideas are discussed: i) the diversity of theoretical visions around lithium exploration worldwide; ii) the interest of the concept of future and the forms of anticipation implied in lithium exploration; iii) most relevant policy recommendations directed to the construction of anticipation methodologies which imply the communication and involvement of local populations and the expansion of the scientific culture concerning the environmental, socio-economic and cultural uses and impacts of lithium extraction and iv) importance of articu-

lating toolkits with the methodologies of public involvement in the anticipation of changes in the landscapes of time and space which result from large techno-scientific enterprises linked to the production/discovery of new sources of energy, or the resolution of energy problems (including in Portugal, the desalination centres, in regions of severe drought).

13:00-14:30 (London)
Curated Session: Securing the Future(s): Creative Futuring for UK Defence and Security
Genevieve Liveley, Emily Spiers, Will Slocombe, John Carney and Jim Maltby

This interactive curated discussion session brings together six UK futurists from very different disciplines and fields to discuss recent collaborations deploying creative and immersive approaches to futuring in defence and security – including cyber security – contexts. This session is designed to elicit deep conversation and reflection amongst both panel and conference participants in response to 2 key questions posed under the conference theme 5. Creativity, Innovation and New Media: (1) How can new media, VR/AR, immersive experience design and games be deployed to activate better futures in this space?; and (2)What media and systems are being used to create future narratives in defence and security, and what types of affordances, limitations and trade-offs do they enfold?

The format of the session (designed to facilitate both live and remote participation) will include 3 informal (10-15 minutes) 'fireside chats' with futures practitioners from UK government defence and security bodies: John Carney, Senior Principal Synthesist, and Jim Maltby,

Principal Scientist, both at the UK Defence Science and Technology Laboratory (DSTL), Ministry of Defence (MoD); and a representative of the UK National Cyber Security Centre (NCSC), part of GCHQ. These conversations will be shaped by questions posed both by conference participants and by 3 academic interviewers, who will introduce each 'fireside chat' with a short position paper (5-10 minutes) framing the theoretical and methodological positioning of the case study under discussion: Will Slocombe, Senior Lecturer in English and Co-Director of the Olaf Stapledon Centre for Speculative Futures at the University of Liverpool; Emily Spiers, Senior Lecturer in Creative Futures and Co-Director of the Institute for Social Futures at Lancaster University; and Genevieve Liveley, Professor of Classics, Turing Fellow, and RISCS (Research Institute in Sociotechnical Cyber Security) 'Anticipation and Futures Literacy' Fellow at the University of Bristol.

Slocombe and Carney will discuss the role of speculative and science fictions in creating and communicating futures narratives, both as providing ready-made security and defence scenarios as well as inspiring and providing the building blocks for new imaginative fictions in this context. They will share learnings from recent Dstl's Science Fiction Community of Practice events, including its Science Fiction Symposium, Science Fiction writers retreat, and they will introduce TWIST (sTory WritIng for Science fuTures) as the latest creative futuring project under development.

Liveley and the UK NCSC interviewee will share examples from a co-created storybook of futures narratives set in a near future of March 30th 2031 (inspired by real news stories and cyber security incidents) as a creative means of enhancing anticipation and futures literacy across the cyber security ecosystem. They'll analyse the po-

tential of such stories to help identify potential weaknesses in existing policies and plans, explore new ways to mitigate future risks and harms, and – crucially – to build not only resilience but forward-thinking anticipatory 'prosilience' in decision and policy-makers.

Spiers and Maltby will discuss the Museum of the Future (MOTF), a highly innovative virtual-reality environment (VRE) designed by Dstl to highlight the uncertainty of the future, using avant-garde techniques of immersion, cognitive estrangement, and other narrative and world-building techniques to encourage audiences to query and so better understand their own anticipatory assumptions. The aim of the MOTF project is to promote cognitive flexibility, enhance futures literacy, and ameliorate against the effects of knowledge shields by immersing audiences in three speculative environments that prompt novel ways of considering possible futures. This section of the session will be followed by an interactive demonstration of some of the features of the MOTF, incorporating (if technically feasible) some element of direct audience participation (15-30 minutes).

Connecting these 6 contributors and these 3 case-studies is an open and collaborative approach to bridging the academic/practitioner/policy divide, a deep commitment to interdisciplinary futures working, and the use of experimental co-produced and creative approaches throughout the research process. Each member of the panel is interested in exploring new ways in which we might better understand the dynamic relationship between futures thinking and anticipation in defence and security, recognizing that narrative and stories of all kinds offer particularly valuable tools for this challenge (see, e.g., Poli 2018; Liveley 2017; Miller 2011, 2006; Currie 2007). They understand that futures thinking in this space involves particular expertise in using "future-based

information [and] acting in the present" (Poli 2017, 260; cf. Miller, Poli, and Rossel 2017; Miller 2018; Poli 2018), and see futures literacy – understood broadly in this context as "the capacity to think about the future" (Liveley, Slocombe, and Spiers 2021) – as an essential competence and capability for all those in defence and security working towards 'securing the future(s)'.

13:00-14:30 (London)
Independent Paper Session: Decolonizing Anticipation

Voices of Tomorrow: Automation and refugee resettlement decision-making ecosystems
Claude Heath, Matt Falla and Lizzie Coles-Kemp

Voices of Tomorrow is a multidisciplinary research project that uses storytelling, data modelling and the human face and voice to imagine the future of refugee resettlement decision-making processes. The paper describes how cutting-edge creative technologies can be combined with AI technologies to anticipate the conditions that will allow the best possible outcomes for both refugees and their host communities, thus helping to advance policy-making and decision-making in this complex area of policy design and implementation.

Machines are making decisions today that will have a profound impact on people's lives tomorrow. All too often, automated systems are opaque, with little explanation of how they work and how they will impact on people's lives. Such systems often represent people reductively, without addressing what is important to them. Refugee resettlement system design is one area where automated support of decision-making is beginning to play a role, although notably with-

out taking account of the preferences of refugees. In the US, refugee resettlement agency HIAS has successfully trialled an algorithmic approach that seeks to optimise the chances of finding employment within a six-month period, showing that short-term policy goals can be achieved through automation, even when based on sparse data.

In the UK, however, the process of finding locations for the resettlement of refugees remains a manual procedure aimed at meeting acute housing and care needs via a complex and time-consuming series of operational steps. The decision-making process requires multiple stakeholders to match cases with resettlement locations, with the invaluable situational knowledge of resettlement professionals brought into play.

What if it were possible to use data to more fully understand what the future holds for people resettled through semi-automated systems, what would such a future system look like and how might it operate? What responses would there be to a speculative design of such a system? These are the questions asked in joint exploratory work from designers Parallel Systems and Territory Studios, and from researchers at StoryFutures and the Information Security Group at Royal Holloway, University of London. We have been exploring how the simulation of lifelike communicative synthetic humans might allow users of future decision-making systems to anticipate what the life outcomes of real people might look (and sound) like in different resettlement settings.

With the careful design of appropriate prompts, and the marshalling of curated data, current conversational AI technologies (GPT-3) can automatically generate narrative text. This text can be brought to life

in the mouths of animated and life-like human figures, or avatars, using state-of-the-art creative game engine simulation technologies (EPIC's Unreal game engine digital human tool Metahumans for example, among others). These prototype narratives might be described as first-hand accounts from the future, conveying qualitative information about alternative long-term futures for refugees. Decision-makers in resettlement are concerned with questions of efficiency and fairness in the application of policy. Stories, we argue, can convey the potential benefits of resettlement to different locations, providing a vivid and compelling parallel picture of the present, and conveying potential futures. Going one step further, the process of backcasting, working from desired outcomes back to the present, helps define the steps needed to reach policy objectives. Stories therefore becomes a mechanism that has the potential to continuously calibrate and renew the picture of what success in the resettlement space looks and sounds like.

Refugee resettlement is not a straightforward or linear process but an extremely complex and finely balanced one, involving interactions between a plethora of supporters and networks. The Voices of Tomorrow design fiction creates the potential for unintended secondary and tertiary consequences of current and future decision-making systems to be imagined and assessed. As intelligent automation becomes an increasingly accepted solution in society we ask: what kind of automated decision-making, augmented by creative technologies, help to mitigate rather than create risk? How could a creative use of automation support both those needing protection and the people and systems whose aim is to provide sanctuary? What type of processes and problems in refugee resettlement decision-making can best be handled by such a system as Voices of Tomorrow?

Voices of Tomorrow takes up these questions, addressing the challenge of how decision-making systems are to be optimised in areas such as quality of life, economic benefit or the environmental impact of different resettlement options for refugees and evacuees. Might a broader range of indicators, beyond the prospect of employment, allow more accurate predictions and help decision-makers and policy-makers reflect on the desirability of alternative outcomes?

By showing how the outcomes of different policy assumptions can be simulated and dramatised, this research reflects a step-change in how design responses to complex anticipatory challenges are being framed. Two-dimensional static personas are conventional in human-centred design, and yet new technologies offer a new paradigm – an approach allied to the practice of worldbuilding, and where policy and technology design can be redirected towards a better understanding of the needs of all stakeholders.

Harnessing the Past Futures Framework (PFF) for understanding histories of the future and designing alternative futures.
Martins Kwazema

The history of the future is a critical, systematic narration of the transformative trajectory of the future from its state as anticipation in the present-present to its eventual final state as past future in the past. The present-present is an ontological construct that encapsulates conflicting anticipations in different temporal patterns and scales. These anticipations either contest for a hegemony of the present-present or simply exist singularly within it. Upon manifestation of the future from its state as anticipation to past futures in the present-present, these past futures are immediately stored in the

past, thus continually transforming the structure of the past into a cartography of past futures and past presents in historical time. This paper advocates that a critical investigation of these past futures in the past serves as a means of discovering silent, unknown knowable anticipations that latently exist in the present-present and influence the structure, character, and evolution of future. Hence, by investigating past futures in the past, newer ways to designing alternative futures could erupt through the discovery of latent anticipations stuck in the present-present. Further, by problematizing these past futures, novel driving agents, trends, megatrends or wildcards could become discoverable, and they could further be used to hunt for silent, latent anticipations existent in the present-present. Finally, by critically harnessing the potency of these latent anticipations in the present-present and structuring the trajectory of their transformation into past futures, newer, creative methods for writing histories of the future and developing alternatives futures could erupt. The paper proposes the Past Futures Framework (PFF) as both an anticipatory tool and an element of futures literacy that enhances the capability of humans to critically investigate and problematize past futures as a vital step towards designing alternative futures.

My proposed presentation is primarily based on a paper that I have published in the journal of Futures in 2021 as a part of my ongoing PhD project. In the paper, I theorized and introduced the Past Futures Framework (PFF) as an anticipatory framework for investigating the future in West Africa. Hence, my conference presentation and paper is related to existing research on Anticipation Studies and Futures Literacy because the foundation of the Past Future Framework (PFF) is established as an element of futures literacy based on the rudiments of the Discipline of Anticipation. The paper simply advocates for the possibility of using intelligence from past futures to de-

velop alternative futures using the anticipatory tool which I have theorized and termed the Past Futures Framework.

The paper argues for the potency of past futures and the Past Futures Framework (PFF) for hunting for anticipations in the present-present. It also argues that critical investigation and problematization of past futures could serve as a means for generating novel driving agents, trends, or megatrends that could be used to hunt for latent anticipations existent in and influencing the structure of the present-present and the future. Further, using the elements employed in theorizing the PFF, I advance a new definition of the 'history of the future' as the systematic narration of the transformation of the future from its state as anticipation in the present-present to its final state as past futures in the past.

Biospherefutures: Launching a global collection of social-ecological scenarios studies

Marta Berbés-Blázquez, Jan Kuiper, Garry Peterson, Linna Fredström, Codruța Savu, Anne Guerry, Laura Pereira, Elisa Oteros Rozas, Stephen Carpenter and Liam Carpenter

Biospherefutures.net is an online database to collect and discover social-ecological scenario studies from across the world. Its goal is to enhance social-ecological scenario research and teaching, and contribute to assessment initiatives at national, regional, and global scales. Biospherefutures responds to recent calls for more inductive, bottom-up scenarios approaches for environmental assessments. Together, the case studies can be used to explore the various ways in which the future might unfold, give insight into the diversity and plurality of people's expectations and aspirations for the future, and

help understand interactions between people and nature in different contexts. Furthermore, by providing access to existing scenarios, methods and other researchers' experience and advice, Biospherefutures seeks to reduce the difficulty and costs of building new scenarios. Social-ecological scenario planning requires integrating multiple types of knowledge, utilizing diverse methods, and managing relationships with a variety of people. Comparing scenario approaches and building a self-reflective community can make it easier for practitioners to design processes that meet scientific or local goals, as well as ensure that methods are chosen that provide a good fit to a wide variety of contexts.

In this talk, we first describe the rationale for the database, introduce the database and the criteria we use for selecting examples for inclusion. We present a synthesis of the examples included in the scenarios to date, highlighting emerging patterns and possible avenues for further research. We end with a call for contributions. We invite the creators of social-ecological scenarios to use and contribute to this database. The utility of this database and its potential to enhance the community of practice will increase as the number of cases in the database increases, and the ability of people to access and use resources contained in the database is improved.

How to avoid epistemic injustice in narrative foresight: The case for taking seriously the dialogical capacities of argumentative forward-looking storytellers (homo argumenticus-prospectus-narrans)
Yashar Saghai

Narrative foresight and allied programs have rightly brought attention to and promoted an array of lay narratives of desirable futures to give voice to marginalized, silenced or under-represented communities and individuals (Milojević and Inayatullah 2015; Bishet 2017). According to most of these approaches, these voices (whether Western or non-Western, indigenous or not) favor expressing their visions of desirable futures in narrative form over crafting logically valid arguments to justify what makes those futures desirable (Banks et al. 2006; Sand 2019). Therefore, these approaches highlight non-argumentative functions of narratives—from self-expression to resistance, community-building, and sensemaking—but neglect cases in which narratives are meant to be persuasive. Yet, anticipatory storytelling can be used to persuade others of the desirability of a future when consensus on desirability is absent, or the imagined future is new or unexpected. In this paper, I argue that some lay narratives of desirable futures should be viewed and engaged with as arguments nested into a wider dialogue in which reasons are exchanged, doubts raised, and critical comments made. To do this, I first make the case for the idea of arguments in narrative form. I next show why failing to critically engage with narrative arguments can produce epistemic injustice. This paper reflects on the ethics of anticipatory practices (epistemic injustice) and shows why argumentation capacities are essential for futures literacy and public debates on desirable futures.

The view that narratives sometimes function as arguments has gained increased support in recent argumentation theory (Olmos ed 2017). For instance, Christopher Tindale (2021) explains why the supreme court of British Columbia accepted a Tsilhoqot'in Nation creation story as evidence to ascertain their territorial rights, irrespective of archeological evidence of prior settlement. In the same vein, the concept of narrative argument sheds light on non-Western

philosophers who, like Chinese virtue ethicist Mencius and Persian philosopher Sohrawardi, tell stories that work as vivid reasons (irreducible to a collection of dry propositions) in support of a normative claim (Tindale 2021, 116). Argumentation theorists have shown that most inferential relationships between reasons and the claims they support cannot be captured with the tools of deductive and inductive logic. They have so far identified roughly one hundred "argument schemes" of this sort (neither deductive nor inductive but plausible) that can be dialogically assessed using "critical questions" (Walton et al. 2009; Baumtrog 2021). Argumentation theorists committed to epistemic pluralism about justification (Coliva and Pedersen 2017) are probing the wider space of reasons and identifying informal rules of debate in concrete argumentative contexts, inspired by anthropological work on the ubiquity of argumentation in many communities with or without connections to Western Europe. The perspective I defend is thus argument-focused but not Eurocentric. In this paper, I identify narrative argument schemes used in lay narratives of desirable futures and propose critical questions to initiate discussion on their strength, without excessively reducing their complexity, richness, and ambiguity.

My second claim is that failing to engage critically with others' narrative arguments for desirable futures is morally objectionable. Unlike what is often assumed, commitment to epistemic pluralism about justification does not entail incommensurability between modes of justification (or "ways of knowing") or giving up the view that truth is the primary goal of knowledge. And, ontologically, this approach is compatible with social constructivism about futures. Not engaging with others' narrative arguments leads to committing what feminist philosopher Miranda Fricker calls an "epistemic injustice" (2007), that is, a wrong done to a person as a knower. This is because

the narrator's dialogical capacities as an arguer responsive to reasons would not be acknowledged and their conceptual and narrative resources for collective self-understanding would be undermined if their reasons are left internally and externally unchallenged. If narratives can be used to engage with the future in the justification mode (Mandich 2020), merely giving voice to them for the sake of inclusion is normatively insufficient. The difference is between deliberating with someone and showcasing them. Although it is doubtful that we deserve to be called "homo sapiens", all of us are at the very least argumentative forward-looking storytellers (homo argumenticus-prospectus-narrans).

13:00-14:30 (London)
New Ideas Session

A narratological perspective on business communications and futures literacy
Cecilia Thirlway

Narratives are an essential ingredient of how we construct the future – the stories we tell as a society and the meanings they create build our visions of what may come and spur us to action (Godet and Roubelat, 1996; Liveley et al, 2021). However, we are currently experiencing a "deficit of social imagination" – this "matters because societies need a wide range of ideas and options to help them adjust, particularly to big challenges like climate change" (Mulgan, 2020, p3) Miller (2011) calls for "rigorous imagining" to help understand the ways in which we make sense of the present and become better at "inventing imaginary futures" (Miller, 2011, p25). We need not just

extrapolation of data to make predictions, but also the ability to visualise possible futures and translate them into action (Poli 2021).

Businesses in the UK spend over £3bn a year on PR and communications (IbisWorld, 2021), which frequently involves creating stories about businesses, products and services (Holliman and Rowley, 2014). This practice has increased in recent years through the practice of digital content marketing (HubSpot, 2021), a strategy that allows organisations of any size to communicate directly with their chosen audience via digital channels (Koiso-Kanttila, 2004; Rowley, 2008).

Many of these narratives deal with speculative or uncertain futures (Beckert, 2016), and all are told with particular, generally commercial, objectives in mind, with facts typically selected (or suppressed), emphasised and re-presented in the service of these aims (Arora, 2020; Nelson and Park, 2015). In a blurring of boundaries between fiction and business narratives, many marketing communications professionals have brought expertise about creating fictional narratives to bear in the field of business communications, chiefly as a means of increasing the impact of their work by engaging audiences emotionally as well as rationally (Etzold 2013; Movshovitz 2015; Booker 2019; Campbell 1993).

The stories told by businesses also increasingly incorporate elements of social responsibility and sustainability (McDonagh, 1998; Hill and McDonagh, 2020; Prothero et al, 2010). Businesses wish their marketing to present them as having a social purpose beyond simply being profit-making engines (Content Marketing Institute, 2008). Nowhere is this more evident than in organisations whose technology prod-

ucts or services are designed to address sustainability and climate challenges.

My research aims to explore these business narratives from a narratological perspective, examining the myths and stories they create and the impacts they have on futures literacy and anticipatory practice.

Escape forward: Prison in Italy in 2040
Carla Broccardo, Rocco Scolozzi and Lorenzo Trigiani

The narrative of prisons as necessary reformatories and corrective facilities is well established in modern society. Prisons represent a "humane" way to discipline and punish, and a useful institution providing security and justice. Moreover, prisons are generally considered an adequate mechanism to turn misconduct into productive behaviour. On the other hand, the incarceration is critized because of its entanglement with exploitative social structures and for being entangled in discriminatory practices, within a "justice industry". Alternatives to incarceration including restorative and transformative justice, rehabilitation, and social programmes have been claimed (Zoellick, 2018). According to the Council of Europe prison capacities in 51 European countries are almost exhausted with a median 90 inmates per 100 places and almost one third of prison administrations already experiencing overcrowding (Aebi, Tiago, & Burkhardt, 2021, p. 10). The public ignores this problem, if not directly involved, while the prison system involves thousands of people, huge public costs and affects respect for fundamental human rights. This, coupled with the consequences of the recent pandemic and accelerating digitalisation, makes the debate for reform even more urgent and

necessary. In an increasingly interconnected world, does it still make sense to think that people's punishment should be isolation?

An informal group of futurists-lawyers and social innovation activists with a variety of competences and experiences (named Spoiler) is elaborating and proposing alternative visions in Italy, to be respectful of human rights and inspired to the framework of restorative justice. The group began by promoting of a broad and transversal debate in the country, through creative and cultural initiatives, in collaboration with a national newspaper, and strategic interviews. The first initiatives, created in collaboration with the staff of newspaper "Il Dubbio" (the doubt, www.ildubbio.news) interested in guaranteeing the rights of prisoners, was "sui pedali della libertà" (on the pedals of freedom, www.suipedalidellaliberta.it). It is a bicycle tour (14 days, 2000 km) from one end of the country to the other through Italian prisons, along which the cyclist-journalist collected the voices of those who live in prisons every day: institutions, associations, and prisoners, publishing them daily on Il Dubbio. The initiative is repeated from 2020, with different themes every year ("Beyond prison 2020", "beyond prejudice 2021", "beyond obstacle 2022") and with an increasing involvement of associations and citizens. For the end of 2022 it is also planned the creation of a theatre piece, based on the testimonies and interviews collected. Alongside the cultural initiatives to raise awareness on the issue, the group is conducting transdisciplinary research (Lang et al., 2012) through strategic interviews based on the "seven questions" approach (Ratcliffe, 2002), participatory foresight exercises (Faucheux & Hue, 2001) and system analysis through the identification of systems archetypes (Wolstenholme, 2004). The research started in June 2020 and is still ongoing. The first results are emerging from the interviews carried out in 12 Italian cities (until February 2022), involving architects, managers, volun-

teers, prison officers, law professors, lawyers and guarantors of prisoners, psychologists, museum curators, entrepreneurs. At the end of summer 2022 the results of these interviews will provide the knowledge base for the participatory construction of strategic scenarios at 2040, identifying plausible futures and, among these, the desirable futures for the Italian national incarceration system.

Getting conversant with futures, ethical pluralism and anticipations in higher education
Elin Sporrong

Educational Technologies (ET) play an ever-growing part in higher educational settings (Januszewski, 2013), affecting stakeholder relationships and forming new sociotechnical relations. (Ihde, 1975, Ankiewicz et al., 2006). Emerging ET, such as AI-technologies, also have anticipatory impacts in educational institutions, by politics, planning, policymaking and production of ethical guidelines (Light, 2021, Selwyn, 2021).

Acting as a social, legal and material system, embedded in a wider societal and cultural ecology, educational institutions can be understood through many perspectives and timeframes, forming complex ethical issues connected to the use of ET (de Freitas Langrafe et al., 2020). Ethical inquiries are thus, by their very nature, wicked by entanglement of matter and meaning (Tutton, 2017). Overlaps of relationships (such as professional-personal), potential value-tensions and different anticipations need to be considered for conclusions to be drawn about the ethical implications of emerging ET (Edström, 2020).

To reduce the risk of ethics washing, involvement of multiple stakeholder perspectives is necessary but not sufficient (Johnson & Smyth, 2011). A challenge for empirical research is to sort out, define and communicate relevant aspects, as these are possibly interrelated (Fuller & Moran, 2000, West 2020, Odelstad, 1992). The choice and use of methods in educational institutions also relates to broader ethical matters of inclusion, uneven distribution of power amongst stakeholders and the societal responsibility of higher education (Nissenbaum & Walker, 1998).

The messy and complex base for ethical investigations, requires methods that open up for a pluralistic understanding of possible futures, ethics and ways of knowing (Ess, 2020). The fostering of capacities for anticipation and futures literacy, can facilitate for stakeholders to become conversant with futures, ethical pluralism and anticipations, on a more equal basis (Light, 2021).

Desired feedback Drawing on the work of Roberto Poli, I regard the overlaps of values, perspectives and aspects of educational institutions, as context-sensitive layered levels of epistemological and ontological reality (Poli, 2017). My work investigates the potential of post-qualitative (Nordstrom, 2021) and postphenomenological (Rosenberger & Verbeek, 2015) doxastic-axiological counterfactual (Booth et al. 2009) methods that induce imagination and a pluralistic understanding of futures, ethics and ways of knowing.

More specifically I am interested in methodological approaches that enable systemization, such as worldmaking, Futures Literacy Labs, Critical Layered Analysis and scenario planning, within higher education (Miller, 2007, Vervoort et al., 2015, Inayatullah, 2004).

In the process of exploring what Higher Education (HE) stakeholders perceive as valuable in the present, I see a methodological challenge of how these values could be investigated, without impacts of the many anticipations and expectations about emerging technology, found in HE. I would like to take part of reflections on and experiences of this issue.

The loss of present values could be seen as an ethical dilemma through a counterfactual comparative account of harm (Klocksiem, 2012). Loss of utility is, however, rarely discussed in research concerning ET. Greater awareness of how anticipations form our perceptions of present values could allow for more robust research on what stakeholders identify as valuable in their present practices and contexts, and thus what could be worth maintaining or enhancing for the future in e.g., development of ET.

Talking Trees and the Design-Led Intervention
Krzysztof Wronski

Autonomous Tree is an art installation in which a tree is transformed to hypothetically represent and act on the behalf of non-human living beings within established human systems of governance. The installation focuses on a living tree fitted with replicas of digital sensors and devices utilised on autonomous vehicles and security apparatus today. An arboreal chat-bot, accessed by visitors using their mobile phone, enables a conversation between visiting humans and the tree in which the tree issues a financial penalty for the collective harm humans have caused. Over 950 people have met with an Autonomous Tree, including human authority figures such as police officers and politicians, at Dutch Design Week in Eindhoven and Inter-

net Age Media in Barcelona. The three trees chosen for duty have theoretically raised €4.300.885,66 for something called the Planetary Wellbeing Marketplace, a fictional exchange where it is possible to invest in the protection and regeneration of Earth's ecosystems and species.

The Autonomous Tree project emerged from a participatory initiative facilitated by Krzysztof Wronski during the Master of Design for Emergent Futures (MDEF) called Hypothetical Authorities, aiming to reframe relationships with authorities, who shapes them, and the challenges they focus on—primarily focusing on enhancing agency and participation. Reflecting on the potential of increasing participation in the policy making process, a series of interventions took place to invite imagination and involvement in shaping proposals for new or alternative kinds of authorities in society. The interventions included an online chat-bot which guided participants through the process of considering an alternative authority to address a challenge their community faces and a series of workshops where participants that submitted similar authority ideas discussed and further developed authority proposals. The 15 authority proposals that emerged were documented, stamped, and displayed at an event called Design Dialogues organised as part of the MDEF program. Of the 15 Authority Proposals that emerged as a result of the work, the theme of ecological protection to address the climate emergency gained the most collective interest. In an effort to further explore the proposals and involve a wider audience in conversation, an intention was set to create an interactive art piece, speculative design prototype, or public happening that promoted the wellbeing of non-human living beings, addressed human environmental exploitation and damage, and explored the potential role non-humans could play in society— Autonomous Tree is a little bit of each.

Autonomous Tree and Hypothetical Authorities show the value of applying design practice in complex subject matter areas without commercial or organisational goals directing or constraining outcomes. What emerges from such processes are unexpected and novel opportunities to engage people in considering what could and should be and building momentum to challenge current norms.

14:45-16:15 (London)
Curated Session: Community of Inquiry as a Compost Pile: The story of FLxDeep
Nicolas Balcom Raleigh, Martyn Richards, Martin Calnan, Anna Sacio-Szymańska, Kacper Nosarzewski, Loes Damhof, Elles Kazemier and Irianna Liankaki-Dedouli

How will humanity address climate change? It is the top question of our times. There is a growing wave of innovators who have turned their focus to addressing the climate emergency, applying their attention and abilities to produce new knowledge and invent new products, services, resources, and ways of doing things. How can a capability to diversify and vary the futures we imagine for which purposes, or futures literacy, help climate innovators? How can this futures literacy be introduced and developed in Climate-KIC? What benefits (or difficulties) can the capability produce for innovators addressing climate change?

These questions shaped the primary inquiry of the FLxDeep consortium supported by EIT Climate-KIC in Europe. This Knowledge Innovation Community (KIC) launched its ambitious Deep Demonstrations program in June 2019 with a goal of demonstrating a portfolio approach to systems innovation to address climate change at

sufficient scale and in time to make a difference. The FLxDeep consortium was comprised of six partners and leading experts in Futures Literacy and engaged in multi-faceted experimentation in three Deep Demonstrations while offering futures literacy 'train-the-trainer' training to all Deep Demonstration leaders. Their work can be framed as a Community of Inquiry conducting participatory action research in the context of a rapidly changing organization and research setting.

In this panel discussion, members of FLxDeep talk freely about their experiences fostering -- learned from engaging in EIT Climate-KIC. What did we observe? What novelty emerged? What potential did we notice? What could others learn from our experiences? What aftereffects have occurred? What has the experience of working together enabled ourselves and others to do? A metaphorical framing of our work is the compost pile: we have interacted and produced nutrients. Who could use these nutrients and for what purposes?

This panel discussion is relevant to broader discussions about what futures literacy is, how it develops, and how climate innovators can develop and apply it. It touches on larger discussions concerning human processes of anticipation and how awareness of these processes can support development of new capabilities relevant to innovation.

14:45-16:15 (London)
Independent Paper Session: Public Futures 2

Rehearsing climate futures: who are we?
Renata Tyszczuk and Zoe Svendsen

'Climate Conversations takes the climate crisis not just as a 'topic', but explores it as the context of everything we do - in theatre and in our lives. Through the project we will be examining what stories we tell, who for and how. How can facing these challenges sharpen our ingenuity and rigour as artists, as we grapple with the most urgent questions of our time. In an era of extreme jeopardy, where the very future of people across the globe is at stake, we will be asking, who are we? How do we need to change for the planet to survive? And who might we become?' (Zoe Svendsen, Donmar Warehouse, 2021)

The virtual presentation will be a 'rehearsal' of a 'climate conversation' between Zoe Svendsen and Renata Tyszczuk.

These are times of urgencies, emergencies and catastrophe (Haraway, 2016; Stengers, 2015). It is widely accepted that climate change represents a major collective risk and yet both public and political arenas struggle with how to respond, and with what level of urgency. There are calls for increased public engagement with intersecting climate change issues around inequality, race, climate justice and the rights of future generations. However, to many, imagining what disrupted, decarbonised or transformed futures would actually look and feel like in terms of everyday life, seems out of reach. To others, they are all too near and present yet unacknowledged. The way a society imagines its climate future matters, and who gets to do the imagining matters. The challenge is both how to 'stay with the trouble' and 'change the story' (Haraway, 2016).

Zoe and Renata will discuss experiments with improvisation and performance-based work on climate-changed futures that offered not only the potential for more collective and inclusive responses to

these issues but also the space for the imaginative and creative antic-ipation and deliberation that has been lacking in the public spaces of climate research. The conversation will bring together insights from research, theatre practice and public engagement on climate change. Zoe will draw on her recent experience as Climate Dramaturg (Don-mar Warehouse 2021–2023) with her project 'Climate Conversations', and as artistic director of theatre company METIS' series of produc-tions on imagining alternative futures in the context of climate crisis (Svendsen, 2017; 2019). Renata's projects have been exploring the po-tential to rethink 'scenarios' as prompts to, and support for, the col-lective practice of rehearsed improvisation of climate futures (Tyszczuk, 2021).

The conversation will consider the dramaturgical dimensions of public anticipation of climate futures. It will range across questions of temporality, practice, preparedness, prototyping and improvisa-tion inherent in ideas of rehearsal. The interest is in how modes of rehearsal can open up the political and ethical space around climate change knowledges, rather than mobilising particular kinds of re-sponses to it. It will also consider how interactive and immersive performance based work can enable processes of sense-making and meaning-making within the social contexts of climate crisis and un-certain climatic futures. The conversation will itself be a rehearsal, and as such, a way of paying attention to the to-and-fro of different perspectives, constraints, insights, motivations and anticipations. Moreover, 'paying attention' also implies risk-taking, experimenta-tion and thinking through consequences, or 'care of the possible' (Stengers, 2015; 2011). Our hope is that the conversation will hint at the practice of paying attention to the future in the present, and of rehearsing the future otherwise.

Utopia and anticipation: complementary instruments for envisioning the public futures

Hanna-Kaisa Pernaa and Mikko Karhu

Utopia became a famous concept from the 16th century book of Thomas More from which it received a dual meaning as "no place" and "good place" (Levitas 2010). Utopia has been subject of interest of several social sciences including the future studies. It has been given several meanings of which the "ideal, but unreachable place" is the most well-known (Sargent 2010: 2, Levitas 2010: 3-6). In this meaning utopia has been compared with a master plan based on an assumption that an ideal state of society, city, organization, or any target of planning can be envisioned and achieved (Hoch 2014, Popper 2002, Sargent 2000).

Envisioning the future through Robert Rosen's theory of anticipation draws attention to the function of the system in order to achieve its desired state (Rosen 1985). Anticipation is considered as a novel approach to visioning futures, the present state, and the past. When considering utopian thinking and anticipation in parallel, their fundamental difference relates to the accessibility of the desired future, and how it is linked to the actions in the present state. Anticipation does not support the assumption of a permanent, ideal future state of any social structure unlike utopia in the sense of a master plan. Anticipation refers to functioning always manifested in the system as a cognitive process (Nadin 2015).

Theories reconsidering the purpose of utopia (Levitas 2010, 2013) give an opportunity to explore the connection of utopia and the anticipation in a mutually beneficial way. Theories about the functionality of utopia suggest that utopia does not have to be a perfect outcome or outcome at all (Levitas 2010: 4-6, Sargent 2010: 126-127). In-

stead, it can be a modus operandi in an anticipatory process, utilizing imagination by knowingly disengaging from the present's restrictions to our attitudes, expectations, hierarchies, and capabilities.

In our paper, we suggest that when used consciously and purposefully, the combination of utopian thinking and anticipation adds the elements of creativity and human emotion to the consideration of the public future. As a result of a deliberate detachment from reality and with the use of imagination, it is possible to discover and understand – often undercurrent – values and ideologies that are involved in reflecting on the public futures (e.g., Inayatullah 1998; 2004; Appadurai 2013: 286-289).

We believe that without the exploration of emotions, values and personal expectations related to the future, the process of anticipation will remain incomplete. The public debate on sustainable development is an example of expectations for the future that strongly reflect the underlying societal values. In this context, values are often linked to the responsibility of present decisions for future generations. However, in the context of scientific research on the energy transition, societal values have been approached at most as cultural factors without an element of social vision (e.g., Ruotsalainen et al. 2017).

We also suggest that by exploring the future in a way that combine utopian thinking with anticipation, it is possible to naturally broaden the scope of participation in the reflection of a desired future. A temporary leap from reality by "social dreaming" (Levitas 2013: 12-15, Moylan & Baccolini 2007: 95-99) can inspire creativity and encourage

a variety of participants to open discussion about the emotions and values behind the desired future.

Value tensions in the smart city: design approaches to support participation and ethical reflection when anticipating urban futures
Anouk Geenen, Julieta Matos Castano and Corelia Baibarac-Duignan

Smart city scenarios are often univocal and unilateral urban futures, that do not include wider societal perspectives or situated knowledge (Sadowski & Bendor, 2019). Moreover, these anticipations of urban futures often lack assessment on a societal level, and neglect to incorporate soft impacts such as potential value tensions or ethical issues (Boenink, Swierstra & Stemerding, 2010). In this contribution we present two design approaches that aim to stimulate participation and ethical reflection when anticipating smart city futures. The main goal of both scenario-based approaches is to narrate plausible stories based on the use of smart technologies that provoke public, private and civic stakeholders to anticipate and reflect on smart urban futures and their potential ethical impacts. With these approaches we aim to support the early identification and democratic formulation of ethical issues originating from smart city technologies, in order to encourage the creation of more desirable urban futures. In line with the conference themes, this contribution explores the incorporation of new voices and new approaches when anticipating smart urban futures.

Scenarios are a highly applied approach to anticipate the impact of emerging technologies on our society. They combine knowledge on technological innovation and its impact with imagination, to think creatively about possible futures, and to support informed decisions

and policies. Technomoral scenarios (Boenink et al., 2010) are one of the few examples that actively take soft impacts and ethical challenges into account when discussing the future of emerging technologies. Moreover, technomoral scenarios highlight not only the ethical challenges posed by emerging technology, but also explore the mutual interaction between technology and morality, or the technological mediation of values (Swierstra, 2013; Verbeek, 2005). Postphenomenology exposes how technologies mediate the way we experience, and act in the world (Verbeek, 2005). This hermeneutic role of technology has important ethical consequences, since it implies that technologies can actively contribute to the (moral) decisions human beings make. This political significance of technological artefacts needs to be made explicit and debatable in order to facilitate decision-making processes about our (urban) futures. It is important to be aware of these hermeneutic relations when thinking about the future city and the desired role of technology therein, or in the words of Verbeek (2005): 'The fact that technologies always mediate human actions charges designers with the responsibility to anticipate these mediating roles'.

To anticipate the mediating of technology in our urban environment, we take inspiration from technomoral scenarios, however add a participatory element to it. Highly expert-based methods such as the technomoral scenarios, do not emphasize the involvement of stakeholders, who can bring additional situated knowledge and experience to improve the scenarios. To create more democratically informed and rich scenarios, this paper explores how the rationale of technomoral scenarios can be combined with approaches such as participatory design and experiential futures. These design approaches combine imagination and creativity with stakeholder empowerment. They emphasize that it is a matter of creating the right

tools and settings for stakeholders to be involved in the process, and invite them as experts of their own experience. Adding participatory elements to the development or smart city scenarios enhances both its democratic character as lead to better informed scenarios, thereby making society better prepared for socio-technical developments.

We present two different tools that were developed in the context of the ongoing research project 'Designing for Controversies in Responsible Smart Cities'. This transdisciplinary project consist of a consortium of two Dutch universities and five societal stakeholders, and aims to develop tools to support more responsible smart city development. Smart cities incorporate data-driven policies and urban AI with the promise to optimize city processes and improve city life, although are highly contested for their tech-driven and top-down nature. We take this contestation as a point of departure for our tools. Both approaches aim to explore (1) potential ethical dilemmas that different stakeholders might encounter if the proposed scenario occurs, and (2) the consequences of these dilemmas. Furthermore, both tools are built on scenarios that are set in 2030, to stimulate imagination and speculation, yet remain plausible as they extend on current developments and trends.

The first tool is a set of four orthogonal snapshots that provoke debate amongst stakeholders, building on the work of Wright et al. (2014): these are four different scenarios that relate to the same prompt, but each reflect different potential futures and ethical dilemmas. We formulated these scenarios in a series of co-creation sessions with societal stakeholders which are part of the research consortium. We guided our discussion by introducing a prompt that reflects a recently presented EU strategy, which proposed to make data sharing a civic duty. Together with the consortium partners, we discussed

and identified the key indicators and (PESTLE) drivers that shape this scenario, such as specific technologies, relevant stakeholders or societal trends. Moreover, we focused on which values would be central in such a scenario, and what value tensions, ethical dilemmas or other consequences could potentially arise. Starting from the prompt and first scenario, a pushback scenario, positive scenario and unexpected scenario were formulated. These orthogonal snapshots were evaluated in a workshop with members from the municipal ethical committee.

The second tool is an immersive, interactive web experience entitled 'Future Frictions', that gives participants agency to influence smart city futures. This tool was co-created with a consortium partner and an external partner, in a series of design iterations to ensure an engaging and relatable virtual environment. Through relatable future scenarios and interactions with neighbors and passersby, 'Future Frictions' makes participants become acquainted with multiple perspectives and various forms of societal impacts around urban AI. As a result, the experience allows for ambiguity to exist, thereby stimulating participants to identify and articulate the values and issues that matter to them. We reflect on how both approaches help to anticipate and reflect on the ethical and societal impact of emerging urban technology, and stimulate participatory discussions about the future. Different quadruple helix stakeholders can use these tools to reflect on the ethical implications of technology and plan a common ground to collaboratively shape desirable smart city futures.

14:45-16:15 (London)
<u>Curated Session: Storyworlds and Anticipation</u>
Keri Facer, Johannes Stripple, Alexandra Nikoleris, Anna Lyngfelt, Josefin Wangel and Stuart Candy

This symposium brings together scholars working across Politics, Education, Urban studies, Literature and Innovation to explore the distinctive role of storyworlds in the processes of imagining, navigating, reshaping and ultimately acting to create alternative futures. Where the field of Anticipation Studies has been dominated by attention to 'models' of the future (deriving from traditions in biological sciences) and Futures studies has been concerned with the systematic construction of alternative scenarios, this symposium will explore instead the looser generative idea of the 'storyworld' as a site and practice of anticipation – in other words, the creation of a world in which multiple stories can be told. In particular, it will explore how storyworlds might provide a generative framework for developing democratic, critical and reflective anticipatory capacity amongst young people, politicians and civil society.

We understand a storyworld as a 'world in which multiple stories that can be told' – in other words, the creation of an environment that offers a participative quality that allows multiple narratives to emerge. The illustrative example is perhaps fan-fiction where participants are enabled and encouraged to develop new stories set within a particular 'world'. We might also, however, see it in experimental environments such as the 'Museum of Carbon Ruins' – a platform for Climate Imaginaries that enable participants to generate new accounts of fictional pasts from the standpoint of an imagined future world after fossil fuels. We could also see this in the broad genre of vampire narratives – where a key conceptual idea can be taken up, embroidered, mobilised and applied in multiple settings. The concept of the 'storyworld' could also be applied to conspiracy theories, ranging from the global conspiracy narratives of Qanon to the eschatological predictions of endtimes in millennarian cults. Indeed, the 'storyworld' may be central to how we make sense of the world as humans, as we see in young children's reading practices.

Our aim in this seminar is to interrogate the concept of the storyworld – comparing it to concepts of 'modelling' in Anticipation, 'scenarios' in Futures studies, 'narrative' in Futures Literacy – and to explore its potential for participatory, democratic and critical engagement in thinking about futures. We will do this from multiple perspectives – looking at how children and young people encounter and engage with storyworlds in relation to futures of climate change; interrogating the use of storyworlds in the envisioning and exploration of sustainable (or otherwise) futures in civil society action; connecting to ancient traditions of myth making and oral storytelling.

We will also explore how storyworlds might become sites for action, drawing on the recognition that knowledge needs to become personally meaningful in specific settings if it is to become actionable (Hulme, 2009; Jasanoff, 2010) and examining how and whether storyworlds allow participants to unsettle the everyday and taken for granted, to 'estrange themselves' from contemporary society in ways that open up cracks of possibility in the edifice of the world as given and to develop 'heightened sensitivity to the mutability of the world, and with that, a sense of one's own capacity, however modest, to nudge things in one direction or another' (Candy, 2010: 164).

Contributors

Professor Keri Facer (University of Bristol & University of Gothenburg). This contribution will explore the role of interconnected practices of oral storytelling and mythmaking as a mode of encounter with ambivalence and uncertainty in a shared and inherited storyworld. It will examine the link between such encounters and the development of 'negative capability' – in Keats' 1817 terms, the capacity to engage with 'uncertainties, mysteries, doubts, without any irritable reaching after fact and reason' . The paper will explore whether

such a capability offers a distinctive anticipatory stance towards the future that is particularly important in contemporary conditions.

Professor Anna Lyngfelt (University of Gothenburg) How do children encounter stories and engage with them to develop storyworlds about futures of climate change? This is explored through booktalks about two picturebooks, that approach climate change differently. To be able to achieve a participative quality that allows multiple narratives to emerge, 'shared reading' is used (Gallagher, 2017).

Professor Johannes Stripple, Dr Alexandra Nikoleris (Lund University, Sweden) This contribution will explore the Museum of Carbon Ruins as an exemplar storyworld. Since its inception, the Museum of Carbon Ruins has been 'on tour', meeting different publics in a diverse set of venues — from universities, art halls and museums and to science centers and churches. Building on recent interviews with hosts and curators, we would like to explore the extent to which Carbon Ruins has allowed for a participatory, democratic and critical engagement in thinking about futures.

Dr Josefin Wangel (SLU, Swedish University of Agricultural Sciences) For this session I'm developing an essay, i.e. an attempt, at making sense of how two commonly used anticipatory tools ¬– models and stories – give shape to anticipatory practices, and how this in turn shapes what (and whose!) futures are explored and articulated. This is not to say that one is better than the other, but an ambition at better understanding and articulating the strengths and weaknesses of each approach. On the one hand, understanding models as representations of possible pasts, presents and futures, 'none of which are true but some useful', all models can be said to be stories – and all stories can be said to be models. On the other hand, models are not stories (and vice versa) since they build on two radically different logics and practices of representation. Whereas model-making demands establishing system boundaries and relations, as well as demanding a translation of all ways of knowing into that which fit

the model (or, the modelling software), stories are integrative, flexible, and dynamic. Stories, support the kind of open-world, open-ended imagination articulated by Italo Calvino as 'a kind of electronic machine that takes account of all possible combinations and chooses the ones that are appropriate to a particular purpose, or are simply the most interesting, pleasing or amusing.' In a way this essay can be seen as a continuation of previous works (Wangel 2021; Wangel et al. 2019), but rather than moving 'forward' I suspect that I will spend a lot of time doubling back, composting, and staying with whatever troubles I come across.

14:45-16:15 (London)
Independent Paper Session: Time and Temporalities

Six Equations for Modeling the Dynamics of Expectations in Social Systems
Loet Leydesdorff

An anticipatory system inverts the historical relation between a system and its precursors. Hence: $[x(t)] \leftarrow [[x(t+1)]$. Stongly anticipatory systems construct themselves from and in terms of expectations. As Luhmann (1990:45) formulated: "Social structures do not take the form of expectations about behavior (let alone consist of concrete ways of behaving), but rather take the form of expectations about expectations." For example, the rule of law is expected and reproduced in societies which are based on this principle: it is an order of expectations rooted in history. However, an extra-historical system of expectations is leaving historical footprints behind.

The micro-operation of strong anticipation in social systems can be characterized as double contingency: Ego expects Alter to entertain expectations like herself (Parsons, 1968). Following Dubois' (1998, 2003) use of the logistic equation for modeling anticipation, one can specify double contingency as follows: $x_t = a x_{(t+1)} (1 - x_{(t+1)}); 0 \geq x > 1$ (1)

In words: Ego (x) operates in the present (as x_t) on the basis of an expectation of her own next state (x_{t+1}) and the anticipated next state of Alter ($1 - x_{t+1}$). Note that the expectation of Alter ($1 - x_{t+1}$) is here defined in terms of Ego's own expectations about non-Ego; that is, $(1 - x)$. The expectations constructed in one's mind about oneself and Alter precede possible communication between Ego's and Alter's expectations. Alter is processed in terms of awareness without necessarily implying externalization into a communication (Nonaka & Takeuchi, 1995). The term $(1 - x_{t+1})$ models a selection of Ego's expectations of Alter as non-Ego.

Two further equations can be derived which can be used to operationalize "reflection" and "identity," respectively. As in the case of "double contingency," two hyper-incursive mechanisms can be expected to operate "genotypically"; that is, as evolutionary dynamics without reference to a specific and historical state.

Interactions imply historical instantiations. One can expect each Alter (y) to entertain as another Ego an analogous selection term $(1 - y_{t+1})$. The selection terms can operate upon each other and thus lead to Eq. 2:

$x_t = b (1 - x_{(t+1)})(1 - y_{(t+1)})$ (2)

Eq. 2 does not contain any reference to a previous state of the system itself (x_{t-1}). In this model, only expectations are operating selectively upon each other. This equation models the interactions between

Ego's and Alter's expectations. Eq. 2 can be extended to more complex configurations by adding a third selection environment. One can add this third (or each next) term as either a hyper-incursive or incursive routine, and thus obtain the following two equations:

$$x_t = c\,(1-x_{(t+1)})(1-x_{(t+1)})(1-x_{(t+1)}) \quad (3)$$

$$x_t = d\,(1-x_{(t+1)})(1-x_{(t+1)})(1-x_t) \quad (4)$$

Eq. 3 is a cubic equation which models a "triple contingency" of expectations. The third contingency closes the triad operationally. Triadic closure is the basis of the system's morphogenesis. All higher-order configurations (quadruplets, etc.) can be decomposed into triads. Eq. 3 is thus constitutive of the social system of supra-individual expectations.

Eq. 3 has one real and two complex roots. Since a system cannot continue its operations with the complex solutions, Eq. 3 would evolve increasingly into a single value ("eigenvalue") for each value of the parameter C. The parameter C can thus be considered as a representation of the code of the communication. Horizontal differentiation of this code can then be captured by writing lower-case c_1, c_2, c_3, …, c_n, etc. I will elaborate this in the paper (see Leydesdorff, 2021). Three (or more) contingencies operating selectively upon one another can shape a fractal manifold containing trade-offs between tendencies to self-organizing closure and organizational interruptions).

Eq. 4 differs from Eq. 3 in terms of the time subscript in the rightmost factor. Eq. 4 can be used to model a specific—historicial—organization of meanings as an instantiation in the present. The reference to the present in the third factor makes this model historical, whereas the self-organizing system modeled in Eq. 3 operates hyper-incursively, in terms of interactions among expectations about possible future states. An instantiation, however, requires (provisional) integration and organization at specific moments of time. In Eq. 4, the interaction among expectations is instantiated as a specific configuration at time t = t. In summary, Eqs. 3 and 4 model algorithmically the

trade-off between evolutionary and historical perspectives; for example, in Triple-Helix relations.

5,6 Two more hyper-incursive equations follow as possible members of this family of equations. Analogously to Eq. 1, one can formulate as follows:

$$x_t = ax_t(1-x_{(t+1)}) \quad (5) \quad x_t = ax_{(t+1)}(1-x_t) \quad (6)$$

Eq. 5 evolves into: $x = (a - 1)/a$. It follows that x is a constant for all values of a. I submit, as an interpretation, that this evolution towards a constant value of the system (x) through anticipation can be considered as the self-reference of an expected "identity." In the second contingency, identity is based not on the history of previous states, but on entertaining the expectation of continuity of the "self." The identity in the network "me" can be distinguished from the "I" (Mead, 1934). Like individuals, organizations can be expected to develop a symbolic identity in the second contingency.

Using this set of six equations, I propose to model "interactions," the "organization of meaning," and "self-organization" as three coordination mechanisms among expectations; three further equations were derived to operationalize "double contingency," "identity," and "reflection."

Technological Temporalities – Cultural semiotic reflections on anticipatory research in Technology Assessment
Paulina Dobroc, Andreas Lösch and Christoph Schneider

Envisioning the future in entanglement with new technologies and technological progress is a key phenomenon of modernity. The problem-oriented and anticipatory research field of technology assessment has been dealing with such technological visions. In our re-

search group we have created the anticipation approach of vision assessment to analyze and assess the role of technological visions in innovation and transformation processes and to give advice to policy-makers and society. However, there is the question about the position of vision assessment in relation to the technological visions it scrutinizes. Our presentation reflects on how vision assessment relates to the powerful technological future discourses and in which circumstances it supports, reflects or critiques the techno-visionary mainstream.

Today, even if the reference to the future is understood as a key-phenomenon of modern temporality, it is referred to in the political, cultural but also scientific debates with little critical view on the reference to the future itself as a meaning-giving reference. Rather, the critical questions go in the direction of, for example, questioning the representation of society as a whole in the future visions, that is, reflections on the content of the future reference. But what about the form of the reference itself? Furthermore, we ask, what other meaning-giving references exist and what meaning-giving references are possible?

We see future visions as cultural techniques of invention and innovation. Cultural techniques are media, which presuppose the network and become cultural techniques in the network-building process. They operate in networks as rule drivers. The modern cultural technique approach, following on from the findings of Actor-Network Theory, allows us to explain the role of future visions in networks. Furthermore, the reference to the philosophy of Ernst Cassirer and the semiotics of Charles S. Peirce provide a reflection space on the symbolization process within the technical symbolic order, in which future visions play a crucial role.

Seen through this lens, vision assessment is necessarily a part of a certain network and in different ways subject to its rules. In our presentation, through several research examples and cases, we examine how vision assessment can enable different forms of anticipation and under which conditions its critical capacities are nurtured. As a concept that further thinks the approach of vision assessment, the concept of future visions as cultural techniques discusses possibilities and limits of the vision assessment approach. Referring particularly to Peirce's inference theory, we will discuss the involvement of vision assessment in the culture it reflects, while also outlining why vision assessment can nevertheless approach critical reflection on visions.

Alternative Timelines: Counterfactuals as an Approach to Design Pedagogy
James Auger and Julian Hanna

Counterfactual histories modify the outcome of a historical event and then extrapolate an alternative version of history. In literature, imaginaries based on a counterfactual history can offer thought-provoking insights on contemporary life: It's America in 1962. Slavery is legal once again. The few Jews who still survive hide under assumed names. In San Francisco the I Ching is as common as the Yellow Pages. All because some 20 years earlier the United States lost a war and is now occupied jointly by Nazi Germany and Japan. (Dick, 1992)

The Man in the High Castle describes the consequences of one popular starting point for counterfactual histories, Germany winning World War II. Historians tend to focus on military "decision points" at which events could have taken another path (Bernstein, 2000), or

they imagine the absence of powerful individuals to speculate on how things might have been different. Since history is "often written by the victors, it tends to 'crush the unfulfilled potential of the past', as Walter Benjamin so aptly put it. By giving a voice to the 'losers' of history, the counterfactual approach allows for a reversal of perspectives" (Deluermoz & Singaravélou, 2021).

A counterfactual approach offers much potential as a methodology for practice-based design research and pedagogy – designers typically design for the world as it is rather than as it could be (Dunne & Raby, 2013). Design happens within entrenched systems whose foundations in many cases were laid centuries ago. Systems of economy, infrastructure and popular culture inform and constrain design methods, motivations and approaches to the evaluation of designed artefacts. Technological advances are applied via these rules, facilitating the iterative development of products and providing a neat lineage from the past and, more importantly, into the future (Auger et al, 2017). This version of design is increasingly being revealed as fundamentally flawed – highly successful in placating shareholders, it is not fit for purpose where ethical or environmental issues are concerned.

Counterfactuals provide an almost surreptitious method of combining design theory with practice. Through a rigorous analysis of history, the designer identifies key elements that are problematic when viewed through a contemporary lens. The approach can expose dominant structures of power and the influence these have on design culture and metrics: for example, the influence of legacy systems and how they limit the imagination and reveal the hidden or unexpected historical events that influenced the timeline.

In A New Scottish Enlightenment, Mohammed J. Ali proposes a different outcome to the 1979 Scottish independence referendum (Debatty, 2014). A "yes" vote leads to the creation of a new Scottish government, whose ultimate goal is the delivery of energy independence and a future free from fossil fuels. The project was exhibited shortly before the 2014 referendum. This starting point (a yes or no vote) resonates because it vividly presents a life that could have been. It makes us think about the power of our vote and the potential implications of a "bad choice". The second aspect that gives the project wider relevance is the agenda used to drive extrapolation from its fictional starting point – a simple paradigm shift on energy generation and distribution. By defining energy independence as a national goal, it becomes possible to outline the ways this might happen. Important earlier examples of a counterfactual approach to design include Pohflepp and Chambers (Auger, 2012; Dunne & Raby, 2013).

Here is a rough summary of a counterfactual design methodology:
1. The approach begins with the choice of subject – what is to be designed and the creation of a detailed and diverse timeline of its history. 2. The identification of key moments that have led to the state of things; in particular the elements that could be critiqued from alternative value systems. 3. The creation of a counterfactual timeline based on numerous possibilities – this is the key difference in method between historiography and design. The approach facilitates the creation of new value systems, motivations, rules and constraints that can be applied in practice. 4. The design of things along the new timeline; it can be furnished at key moments with artefacts informed by the alternative rules.

A recent Master's project at the École normale supérieure Paris-Saclay followed this brief. Themes included rethinking approaches to aging based on the elimination of the royalist doctrines of 18th century France; a counterfactual history of agriculture with the tool acting as intermediary between the person working and their environment; and the archive – an examination of the modalities for a deployment of queer, feminist and trans-feminist archive design forms in everyday life.

With its focus on underrepresented groups and unrealised possibilities, this last concept resonates with a broader discourse about decolonising design. What alternative value systems and approaches to design might have emerged if 20th-century design history had not been defined by the works of Morris, Dreyfus, Bel Geddes, Gropius, Rams, Starck, Ives, Dyson, and the rest?

Taking up Benjamin's point about "the unfulfilled potential of the past", the most vital use of counterfactuals in design is to allow different voices to emerge that were drowned out by dominant or "standard" narrative(s). Recognising alternative histories can open up valuable future paths and create space for new possibilities and imaginaries to flourish.

Assessing the degrees of openness and closure of anticipatory interventions in science and technology governance
Sergio Urueña

The past three decades have been particularly fruitful in illuminating the role that futures play in the de facto governance of science, technology, and innovation (STI) (Borup et al., 2006; Brown and Michael,

2003; Jasanoff and Kim, 2015; Konrad and Böhle, 2019; Selin, 2007). In addition, several normative frameworks have highlighted the potential of anticipation as an interventive tool to enrich the normative foundations that underpin the dynamics of STI co-production; see, for example, anticipatory governance (Barben et al., 2008; Nelson et al., 2022), responsible innovation (Owen et al., 2013; Stilgoe et al., 2013), and technology assessment (Grunwald, 2019). Anticipation is enabled in these frameworks through the implementation of exercises that engage with future representations (e.g., foresight practices), and it is seen as a key tool for fostering reflexivity (e.g., by amplifying considered concerns and voices) and emancipating different actors (e.g., by strengthening capabilities such as their future literacy). Anticipation is acknowledged as a constitutive force for both the "de facto" and "interventive" dimensions of STI governance (Konrad et al., 2016; Lösch et al., 2019).

Several case studies currently recognize the multiple limitations and potentials of anticipatory interventions (Gudowsky and Sotoudeh, 2017; Lehoux et al., 2020; e.g., Selin, 2011; Withycombe Keeler et al., 2019). However, there is a lack of elaboration on the potential criteria that might be considered for a critical, reflective evaluation of interventive anticipations. Anticipation can indeed be a valuable tool for promoting responsibility. Nevertheless, it is important to recognize that anticipatory practices should confront a range of socio-material trends and factors that are prevalent in the sociotechnical systems in which they emerge and which they seek to modulate (Urueña et al., 2021). The gradations of openness/closure of possibilities and the disruptive power of these anticipatory interventive practices are constituted precisely during these processes of confronting prevailing socio-material factors and trends. Anticipation can expand the futures to be considered and empower various actors whose voices

have traditionally been displaced, but these opening/closing dynamics are far from unproblematic. What capacities are being formed? Why these and not others? What futures are being (dis)enabled? Which futures are being indirectly reified, and why? Whose futures are these?

This paper elaborates on the need to consider and assess the degree of openness/closure of possibilities envisioned by anticipatory interventive processes in STI contexts. It presents a preliminary, or tentative, instrument to support the assessment of these gradients of openness radicality. In emphasizing the need to pay particular attention to the political dimensions of interventive anticipations and how these confront mainstream worldviews and forms of framing futures, the paper connects more directly to the themes highlighted in the "Politics, Justice, and Ethics of Anticipation" theme.

14:45-16:15 (London)
Independent Paper Session: Sustainability Imaginaries

Towards a Conceptual Framework for Contested Imaginaries of Sustainability
Daniel Welch, Nina Heidenstrøm and Dan Lockton

The paper will present the conceptual foundations of the recently inaugurated international research project 'IMAGINE: Contested Futures of Sustainability' (PI: Nina Heidenstrøm, SIFO, Oslo Met University), as well as briefly introduce the project as a whole. IMAGINE is an interdisciplinary research project across humanities, social sciences, design and arts, bringing together researchers from Norway, the Netherlands and the UK, that investigates the power of cul-

tural imaginaries of sustainability to influence societal change, and guide and legitimize actions taken by different societal actors to establish possible futures. The paper will present the emerging conceptual framework from this interdisciplinary collaboration, drawing on results the project's first Conceptual Workshop. The Conceptual Workshop develops theoretical dialogue between the IMAGINE project's three key theoretical foundations in future-oriented thinking in philosophy, social science (sociology and social anthropology) and design studies.

The paper informs understandings of the performative—and counter-performative—nature of anticipatory thought in processes of contestation between cultural imaginaries of sustainable futures. IMAGINE looks specifically at imaginaries tied to three currently unsustainable areas of consumption, in a Northern European context: food, clothes and mobility. As well as addressing existing imaginaries of sustainable futures within the contexts of food, clothes and mobility and the social practices enjoined by these domains of consumption, the project has three further objectives. (1) To convey imaginaries by making them tangible through visual, tactile and audial spaces to audiences, providing a novel arena for critical reflections on trajectories towards sustainable futures. (2) To confront three types of actors—consumers, policy influencers and businesses—with the conflicts, contradictions and contentions between different imaginaries of sustainability. (3) And to establish an interdisciplinary knowledge hub that will advance the theoretical and methodological approaches within the humanities, social sciences, design and arts towards the scientific study of imaginaries. A major contribution of the project will be to bring into dialogue traditions of future-orientated thought often siloed between disciplinary areas and theoretical vocabularies.

Specifically, IMAGINE's interdisciplinary perspective mixing anthropological ethnography, philosophy, sociology, design studies and art practice will provoke novel ways of seeing and understanding contemporary culture by creating fictional visions of alternative futures to engage audiences and practitioners in reflexive understanding of the processes through which future-oriented cultural imaginaries initiate, mobilise, contest and constrain societal change towards more sustainable futures.

The project's conceptual framework is understood as a work in progress of dialogue between three traditions of anticipatory thought. The paper reports on the first iteration of this dialogue. The first of these—the philosophical—draws on Paul Ricoeur's theory of cultural imagination: in which the "utopian" or "productive" mode enables us to imagine the world, and futures, otherwise (Ricoeur 1976, 1984); whilst the "reproductive mode" of imagination draws on the present and past to produce stable systems of meaning and reproduce hegemonic understandings and social structures. Secondly, social scientific approaches, particularly within sociology, social anthropology and Science and Technology studies, offer a range of theoretical resources for understanding how cultural and "sociotechnical" imaginaries (Jasanoff 2004; Jasanoff and Kim 2015) are institutionally stabilized, and contested, by social actors, practices and discourses. One, primarily sociological strand, draws on theories of practice, to explore how imaginaries are instantiated in, reproduced through, and contested by, specific social practices and the understandings they carry, as well as the modes of orientation to the future embedded within social practices and discourses (Mische 2009). Third, the project draws on design research and practice, specifically approaches of speculative design (Dunne & Raby 2013), design fiction (Bleecker, 2009; Sterling, 2005), discursive design (Tharp &

Tharp, 2018), and transition design (Irwin et al, 2015), as well as more critical interpretations of design's role, to materialise plural imaginaries of futures of everyday practices. Making these 'experiential' (Lockton & Candy, 2018) generates knowledge about what is contested—enabling both identification of, and a form of intervention in, the creation of futures (Lupton, 2018). This approach enables an inter-disciplinary future inquiry through design that produces tangible representations of productive imaginaries, making them more available for reflection and discussion.

Speculative critical design as a means for interrogating imaginaries of sustainable futures

Marie Hebrok and Nenad Pavel

This paper discusses the challenges of developing a master's level course in speculative critical design approaches (SCD) at the Department of Product design at Oslo Metropolitan University (OsloMet), in the context of the research project IMAGINE (2021-2024). Main challenges both in developing the course and including SCD in IMAGINE relate to defining meaningful evaluation criteria for student projects, developing effective methods for public engagement, and the assessment of the value of SCD projects in the context of research and education.

IMAGINE (imagine.oslomet.no) will examine current contested imaginaries of sustainable futures, what they entail, how they are embedded within our culture and everyday lives, how they represent power structures, and how we can meet them with critical anticipation rather than determinism. With the aim of making imaginaries tangible, design students and artists will produce visual, tactile,

and audial works to explore cultural, social, aesthetic, political, technological, and ethical implications of ways of legitimising and acting on ideas about sustainable futures. At present we have conducted a pilot of a six weeks course for master's students.

The inquiry based learning process let students go deep into a topic of choice, which they seemed to enjoy. Furthermore, they reported extensive learning outcomes on how to apply design methods to generate critical reflections and discussions around their chosen topics. However, students were unsure about the criteria for their grades, found it difficult to understand what would make one SCD project more successful than another, and missed more specific learning goals. Similarly, our own reflections revolved around the difficulties of assessing the projects. Students spent most of the time on the exploration of their chosen imaginary, leaving less or, for some, no time at all for facilitating response. These problems parallel with the challenge of assessing value in the field of SCD in general and the need for effective methods to facilitate responses from the public.

Design is a discipline increasingly employed to anticipate, critique and question societal trajectories. Various speculative design approaches have emerged under different labels such as critical design (Dunne, 2008; Dunne & Raby 2001), speculative design (Dunne & Raby, 2013), discursive design (Tharp & Tharp, 2019), adversarial design (DiSalvo, 2015), norm critical design (Ehrnberger et al. 2012), and design fiction (Sterling, 2009; Bleecker, 2022). These approaches use design to increase understanding and critical discussion of complex issues. Moreover, to facilitate new ways of thinking, exploring and anticipating current presents and alternate futures that may prove useful in to address current crises – ecological, economical and social. Therefore, SCD can be fruitful to include in design education

to help acknowledge the wider cultural, social, ethical and aesthetic implications of design beyond industries and markets. The SpeculativeEdu project has shown the diversity of practices of SCD across the world, and the prevalence of educational programs (Helgason et al. 2020). At present it seems that the field is resisting shared methodological and theoretical frameworks in order to preserve its openness and bottom up status (Helgason et al. 2021). In our experience, this leaves critical questions unanswered, such as: 1) What is the relationship between the qualities of the tangible outputs of SCD and the responses to them? 2) How can we facilitate valuable responses of reflection and critical discourse as a significant part of SCD projects? 3) How can these responses be observed and evaluated? And 4) What criteria can be derived from answering the questions above to assess student projects in the field of SCD?

In line with HCI scholars Bardzell, Bardzell and Stolterman (2014) we are missing more academic engagement in developing proper theoretical and methodological tools to bring to life, understand and assess the value of critical design. Unfortunately, their approach for interpreting critical design works mainly focuses on determining whether in fact a project is a work of critical design or not as a first step towards assessing its value – but does not engage in analysing value itself. Currently, the value of SCD is questioned by critics. Mainly for too often becoming mere spectacle without any observable impact (DiSalvo, 2021), for preaching to the choir, for the lack of cultural diversity bordering on ignorance (Thackara, 2013), and for failing to facilitate the response from the audience that is its purpose (Tonkinwise, 2014). There is scarce observation of the actual engagement, explorative and anticipatory thinking and widening of the space of possibility that lies at the core of the SCD ambition. Following Ann Light who points out that «a simple placing of an

object/narrative in public view, without creating an interpretive process round it, may not give rise to any critical or speculative thought (…) it may not construct an interested public around it» (Light, 2021:2). IMAGINE sets out to develop methods for facilitating this engagement, and test these methods in the context of a master's level course in SCD. We are inspired by Candy and Dunagan´s (2017) notion of experiential futures and the examples of its enactment through design studios such as the Mitigation of Shock project by Superflux (Superflux.org, 2019), and build on the methodological work of the Imaginaries Lab (imaginari.es).

As we have laid out in the discussion above, the challenge is threefold. Firstly, SCD lacks proper methodology to facilitate and evaluate engagement. Secondly, the relationship between the qualities of the tangible (the product) and the intangible (the engagement) is unclear. Thirdly, there are no adequate criteria from which to assess the value of SCD projects. Consequently, there is a need for a coherent framework that can be applied to teach SCD in design schools, as well as to assess the value of SCD projects in a meaningful way. This framework should be dynamic in the sense that it should evolve with the field, it should also be open enough to not defeat its purpose of breaking new ground and question established norms, beliefs and conventions.

Speculating sideways: participatory enactment of parallel sustainable fashion worlds
Amy Twigger Holroyd and Matilda Aspinall

The mainstream globalised fashion system, with its culture of linear production, overconsumption and rampant waste, is deeply impli-

cated in the devastation of earth's life-supporting systems. Industry-led sustainability initiatives have been incremental and inadequate; fundamental change is required to develop an approach to fashion that works within the means of the planet. Yet the potential for transformation is limited by a collective inability to contemplate alternatives to the status quo. An international participatory research project, Fashion Fictions, responds to this challenge.

Fashion Fictions brings people together to generate, experience and reflect on engaging fictional visions of alternative fashion cultures and systems. The project's participatory process for collective speculation, which is informed by work in speculative design, design anthropology, experiential futures and collective imagination, has a three-stage structure. At Stage 1, contributors submit concise written outlines of worlds in which invented historical junctures have led to familiar-yet-strange sustainable cultures and systems. At Stage 2, participants create visual and material prototypes to represent these worlds, while in Stage 3's 'everyday dress' projects, practices and events from the fictional fashion systems are performatively enacted.

This paper will focus on two aspects of the Fashion Fictions project that connect with the conference themes. The first is the project's strategy for speculation, which focuses on present-day alternative worlds, rather than real-world futures. This approach is influenced by alternate histories in literature and counterfactual histories in historiography, and has been explored in the design field by Dunne and Raby, among others. Its use in this project can be traced to three influences: Diana Wynne Jones's parallel-world fantasy fiction; fashion's complicated relationship with time, which takes in both trend forecasting and the recycling of past styles; and, most importantly, a desire to disrupt the Promethean assumptions of technological

progress that dominate popular understandings of the future. Like more conventional futures work, the exploration of fictional parallel worlds aims to generate insights about the real world and expose possibilities for action in the present.

The second area of focus is the project's Stage 3, and specifically an activity in which twelve participants enacted the fictional World 91. In this world, people 'present themselves', once a week, to the mushrooms that they hail as spiritual guides. The participants undertook this task for six weeks, sharing updates and reflections via comments, images and other media posted to a WhatsApp group. Through their interactions the participants were able to step in and out of the world, switching between a fictional version of themselves and their real-world persona. The paper will reflect on this approach to participatory speculation, with particular attention paid to the merging of real and fictional worlds; the use of real-world and parallel-world voices; and the use of a collective online space for sharing individual offline performances.

14:45-16:15 (London)
Independent Paper Session: Generational Imaginations

Undisciplining Imaginaries of Ageing Futures: Exploring Academics' Hopes and Fears for Their Ageing Futures
Helen Manchester and Matthew Lariviere

Ageing has become a focal point for major research investments across a range of disciplines. Meanwhile, due to the complexity of issues connected with ageing societies, from pressures on social care to increasing health inequalities and questions of ageism, there are

calls for interdisciplinary working around present and future concerns. One of the 'problems' of interdisciplinary working is that each discipline frames its own imaginary around 'ageing futures'. Often these disciplinary imaginaries are built on 'old' images of the future created by ideas in the present (Pinto et al, 2021).

This paper explores and reflects on a process that set out to open up new conversations about ageing research across disciplines in our HE institution. We worked with a writer to run two speculative fiction workshops. By using creative thinking and speculative design methods, we aimed to create a space for researchers to meet, explore and imagine dystopian and utopian ageing futures. We asked researchers to bring their disciplinary understandings of ageing to the workshops but also to engage with their own fears, anxieties, dreams and desires concerning the kind of later life they would like/not like for themselves, their families and friends.

Our paper explores how intentionally provoking emotional responses (fear, anxiety, delight, wonder) in anticipating ageing futures might move people to imagine, across disciplines, different possible responses, supporting our capacities to develop anticipatory thinking and practice.

Social-Fut-Lab: a participatory foresight exercise about the future of the right to work with high school students
Fernando Cobos Becerra, Rocco Scolozzi, José Antonio Rodríguez Mena, Susana Mayo Albargues and Angels Escrivà

The number of studies on the "future of work" has grown rapidly in recent years, but the possible futures of the right to work are little ex-

plored. This paper presents the experience of a group of teachers and trainers who collaborated in the structuring of a foresight exercise for high school student on the future of the right to work.

Work is recognized as an essential part of the human condition, as a value that provides dignity, an enabler of other human rights for life; at its best, it enables an adequate standard of living (Mundlak, 2007). The future of work has been a topic explored by futurists for many years (Applebaum, 1992; Boyd & Huettinger, 2019; Cazes, 1976; Granter, 2008; Khallash & Kruse, 2012; Williams, 2008). Work implies the generation of income as well as the individual fulfilment and the constitution of one's identity and social inclusion; consequently, it is recognized that work belongs to the sphere of human rights (Sarkin and Koenig, 2011). Although the right to work remains controversial, as it is linked to fundamental questions of political philosophy, it offers interesting prospects for a future-oriented discourse on rights in the educational context and civic education.

On the horizon, the subjects of work remuneration (providers and recipients) and the relationships between them as we define them today could disappear or become unrecognizable (Ruotsalainen et al., 2016). On the other, the theme of rights and, specifically, of right to work is almost absent in educational praxis, "leaving them invisible in the school institution and the teaching-learning processes" (Redón S., 2020). These absences are framed by the hegemony of neoliberal economic ideas (Branco, M., 2019), the invisibilization of care work, between its labor recognition and the private sphere (Comas-d'Argemir, D., 2019) and finally, by the discourse of employability and entrepreneurship as alternatives to the very idea of the right to work (Rodríguez Crespo et al. 2020).

With the aim of promoting futures literacy, some teachers first experimented personally and then guided their high school students along a reflection on the future of the right to work, following an explicit protocol (called "Social-Fut-Lab") inspired by Fut-Labs (Emanuelli et al., 2018). The claim that everyone has their right to work can be a way to promote critical thinking and prospective on issues such as labor democracy, the organization of domestic work or the transition to a sustainable society (Scotto, P., 2020).

Social-Fut-Labs were developed in three main phases, plus a questionnaire administered at the beginning of the lab and repeated at the end. The different answers provided by the students would show the effects of the Social-Fut-Lab. In this, the first phase focuses on the understanding of past and current changes, using a historical reconstruction of the main events related to right-to-work drafts over the last three centuries. The second phase concerns the visualization of possible alternative futures in terms of extensions of the current state (business as usual scenario) and the definition of desirable futures. The third phase returns to the present and uses what has been seen of the past and future, in a simplified backcasting exercise, to develop an individual or collective action plan.

The experimentation was coordinated by an Italian-Spanish team and involved students from two groups of students in a high school in Huelva (southern Spain), a medium-sized city with problems of emigration and seasonal work.

The initial questionnaire has shown, among the 59 students (78% women): 69% declared a family income of less than 1,500 €/month, 80% did not know the articles of the Spanish constitution on the

right to work. 45% reported elements of emotional and psychological distress. A lack of knowledge of certain terminology emerged in the initial brainstorming, although they do recognize some ethical values linked to social classes and with respect to their youth emancipation. Among their most important values emerged their personal autonomy and access to housing. Finally, 73% think they will not find a job related to their studies within a year. The pilot application will continue next school year.

Guided reflection on the right to work provoked initial disorientation and emotional involvement, given the particular social context of Huelva; perhaps because of this it could have great potential to support improved aspirational capacity at the community level.
All this contributes to refining the discourse and shaping the way the Social-Fut-Lab can be applied and further developed. We think that the results will be significant only after some experimentation and evolution of the model itself.

The protocol was found to be easily repeatable and particularly suitable for promoting futures thinking and the development of anticipatory skills in middle school contexts, where foresight approaches are generally absent. It is hoped that the model will be recognized and disseminated by other educational institutions as way to promote the ability of young people to anticipate and democratize their future.

Future oriented model for Science Education
Erica Bol

FEDORA; regenerating the ecosystem of science learning by developing a future-oriented model to enable creative thinking, foresight and active hope as skills needed in formal and informal science education.

The relation between science and society is strongly influenced by the impressive acceleration of scientific and technological (S&T) development. Within this society of acceleration and uncertainty, the young are experiencing a sense of derangement within the amount of disintermediated information coming from society and an alarming sense of loss of future and hope.

In face of these changes, schools and, somehow, universities are losing the pace of change and are failing to equip the young generation with a) thinking skills needed to organize knowledge in a society of acceleration; b) future thinking skills needed to grapple with the society of uncertainty. How to develop these skills represent the two blind spots of research and innovation, that we are exploring through a multi-layer (institutional, conceptual, cultural) research approach, an articulated structures of actions aimed to impact at institutional, individual and societal level, and a multiform set of research methodologies (qualitative and quantitative surveys, design-based research, design-driven methodologies, Delphi Study methodology, and others).

Our research outcomes will contribute to: a) breaking down the current institutional, conceptual and cultural barriers that hinder an effective cooperation between science and society; b) developing a future-oriented, inter/multi/transdisciplinary and diversity-responsive approach to science education; c) broadening the MORRI indica-

tors to embrace the future and diversity dimensions and to foster the promotion of Science Education as dimension of RRI; d) suggesting strategies for proactive and anticipatory policy making to align educational institutions with the society of acceleration and uncertainty; e) forming a new generation able to manage the complexities of a fast-changing and fragile world and value science learning as locus of identity formation as persons, responsible citizens more engaged in science and future STEM professionals.

We will present our current outcomes (year 2 of 3 years project).

FEDORA is a project in cooperation between Teach the Future (NL), University of Bologna (IT), University of Oxford (UK), University of Helsinki (FI), Kaunas University of Technology (LI) and formicablu.

Open the Door Wide to Youth and Intergenerational Fairness! Youth engagement in decision-making to ensure inclusion and intergenerational fairness moving forward
Catarina Tully, Steve Gale and Passy Ogolla

Young people are deeply concerned about the world they will inherit but for them the door to participation in decision-making is often closed, or only slightly ajar. In the best of light, youth are seen as potential beneficiaries of development aid, and not seen as true participants in the decision-making that will shape the nature, targeting, success, and sustainability of aid. Regrettably, the aspirations of today's youth for a better, fairer, and more equitable world are not heard or acted upon, or sometimes even encouraged. International efforts on youth engagement are seen as ineffective and tokenistic by youth in plugging in their voices, perspectives, expertise and needs

in decision making. Actively and intentionally engaging the planet's 2.4 billion youth is critical to effectively supporting our common global development priorities, such as the United Nations' Sustainable Development Goals, while also stemming the rising tide of global youth disillusionment with the status quo. Locked out of programmatic decision-making, today's youth are also unable to influence policies that are fair from an intergenerational standpoint. That is, those policies that allow people of all ages to meet their needs in a way that does not short-change or undercut the ability of future generations to meet their own needs. Call it a "double whammy" in that youth voices are stymied in today's aid decision-making process and, as a consequence, are locked out of decision-making on vital issues like climate change that will have a disproportionate impact on their own future.

This topic is a priority for 2022: The UN secretary General has committed to "Listen to and Engage with youth" as one of his twelve priorities in "Our Common Agenda". Ideas to address the current lack of effective youth engagement mechanisms include a Youth Office, Special Envoy for Future Generations and measuring an index of youth engagement. This provides an opportunity for the development of a meaningful youth engagement mechanism in decision-making and policy processes (for national, regional and global contexts). "Nothing about us, without us!"

The authors will: (1) elaborate on six troubling trends in youth engagements; (2) outline concrete steps and ongoing networking both organizations are taking to engage youth and to advance the practice of foresight; (3) map current endeavors, identify opportunities and propose policy recommendations for promoting foresight and youth engagement in the multilateral system; and, (4) describe a pioneering framework to assess intergenerational fairness as to whether a policy

decision might be considered "fair" to different generations, now and into the future.

THE AMERICAS, NOVEMBER 4

4TH INTERNATIONAL CONFERENCE ON ANTICIPATION THE AMERICAS

NOVEMBER 4, 2022

10:00- 10:15 (Phoenix)
<u>Conference Welcome | The Organizing Committee</u>

10:15-11:00 (Phoenix)
Keynote | *Vanessa Andreotti & Chief Ninawa Inu Huni Kui*
<u>Gesturing Towards Decolonial Futures (GTDF): a decolonial approach to systems/complexity education</u>
GTDF is a transnational, intergenerational, and inter-disciplinary collective of activists, students, educators, volunteers and Indigenous knowledge keepers who work closely together to develop public pedagogies and artistic interventions at the interface of two sets of questions: 1) questions related to confronting historical, systemic and ongoing social and ecological violence, and 2) questions related to the unsustainability of modern-colonial systems and ways of being. The collective experiments with pedagogical and artistic approaches that can support people to deepen their capacity and enhance their stamina to face overlapping concerns related to racism, colonialism, imperialism, climate change, biodiversity loss, economic instability, mental health crises, militarization, social polarization, erosion of rights, intergenerational conflicts, and the intensification of social and ecological violence. These approaches emphasize the impor-

tance of engaging with the inevitable complexities, difficulties, and failures involved in efforts to address social and ecological challenges, and the need to commit to social and organizational change over the long-haul, rather than seek quick, simplistic, or feel-good solutions. This session will offer an overview of the work o the collective focusing on decolonial systems/complexity education.

11:00-12:30 (Phoenix)
Curated Session: (Near-) Futuristic Constitutionalism and Governance: 2050 and Beyond
Mark Rush, Carissima Mathen, Ran Hirschl and Bryan Alexander

In this panel, we will discuss scenarios for how notions of liberal and constitutional democracy must change (in fact, they are already changing) in response to changes in constitutionally exogenous factors such as: • Climate change • Advances in technology • Wealth creation and increasing economic inequality • Population growth and increasing urbanization • Access to education • Increased social alienation from and mistrust in governance institutions
The factors are clearly interrelated. For example, liberal education led to technological advances that precipitated climate change and disrupted education in the wake of COVID. Wealth, education and technology have radically increased the power of private actors vis a vis the power of government. All of these factors are precipitating changes in how democracy functions, forcing nations to rearticulate the scope and definitions of rights and liberties, and, we contend, require a reconsideration of how constitutional government can and will function in a world that will be more populated, more crowded, more unequal, and more digitally interconnected.

Our inspiration for this proposal draws upon our current research: Bryan Alexander's ACADEMIA NEXT explores how technology, demographic change, and wealth disparities will affect the functioning of higher education. Given the close relationship between liberal education and liberal democracy, any disruption of the former will result in disruption of the latter. His forthcoming work, UNIVERSITIES ON FIRE, will be published by the Johns Hopkins University Press.

Ran Hirschl's CITY, STATE contends that the increased power and role of cities in global politics and economics warrants a reconsideration of their constitutional status within their nations and as independent political actors

Carissima Mathen's writing on the challenges governments face in regulating speech and social media demonstrate the complexities of balancing powerful actors' speech rights with the privacy rights of the potential victims of trolling, revenge porn and so forth.

Mark Rush's work on representative government and his contemporary work on the impact of science and technology on the relationship between citizens and government demonstrate the need for scholars to rearticulate or modernize their conceptions of individual rights, collective action, and the referee role government must play among increasingly powerful private actors.

Together our work suggests that scholars must draw upon and from across the spectrum of disciplines to reconceive the role of government. While our work is rooted in the present, it is unquestionably forward-looking. In some ways, science fiction anticipated or addressed the questions we raise.

In futuristic visions of government across galaxies, governments are tiny compared to the populations they oversee. This contrasts to current calls to increase the size of bodies such as the U.S. House of Representatives or the European Parliament.

In futuristic visions, spacecraft and societies are essentially high-tech company towns in which the means of surveillance are pervasive and clearly at the governments' disposal. Yet, this has not been a pervasive issue in science fiction despite contemporary scholarly concerns about digital and terrestrial surveillance.

Hirschl's vision of a globe dotted with densely populated cities compares to a federation that spans an empty galaxy or universe and is dotted with dense population centers called planets. On the one hand, people live in close proximity in city or planetary "centers" that are distant from one another. Yet, they are connected ever more closely by technology.

In our panel we will look to engender discussion not only about how we must reimagine governance under such conditions, but how quickly we must do so because the future that was once the realm of science fiction is undoubtedly upon us. Worldviews about individual rights and liberties and the role (and capacity) of any government to protect those liberties while maintaining the trappings of democratic accountability. The exercise of rights and liberties must be different under crowded, technologically-connected conditions than under much less crowded, connected conditions. Under the former, clashes of rights will proliferate and require a more active, powerful governmental role in conflict management.

Our aspiration for this panel proposal is to engender a truly cross-disciplinary discussion of what is, indeed, the near-future of liberal and constitutional democracy. With the benefit of crowdsourced, cross-disciplinary input, we hope to generate an agenda to acknowledge and address: 1. the tension between liberal constitutionalism's emphasis on individual liberties and the clear need for stronger states (or at least stronger governance) to address the challenges we note; and 2. the looming tension between national constitutions, national sovereignty etc. and the need for coordinated collective action at the global level to address the issues we identify.

11:00-12:30 (Phoenix)
Independent Paper Session: Images of the Future

Decolonizing the image
Howard Silverman, Ameenah Carroll, Inbar Sharon and Madeline Silberger-Franek

Fred Polak's "image of the future" has been highly influential in the futures community, but his assumptions and findings are easily critiqued from decolonial positions. Given these contradictions and complexities, an examination of the literature on Polakian images can serve as a useful frame for exploring futures thinking past and future. In this presentation, we adopt a retrospective-prospective stance in critically and appreciatively reconsidering the image.

Writing in the 1950s, Polak saw himself as living through "a literal breach in time." He hypothesized that cultures rise and fall based on the vitality of their images, and he surveyed the rise and fall of images "that have sifted down through history into the receptacle we

term Western civilization." His particular focus was on "the meaning of time and its flow in history," such that "a Society is at once pulled forward by its own magnetic images of an idealized future and pushed from behind by its realized past."

Given the breadth, allusions, and ambiguities in Polak's writings, they have been and can be developed in divergent ways. Kenneth Boulding shifted focus from the social collective to individual participants and their anticipatory inferences, writing: "the meaning of a message is the change which it produces in the image." Oliver Markley and Willis Harman shifted focus from "the meaning of time" to "images of man" and described four levels of social change in an iceberg-like diagram. Wendell Bell emphasized the scientific study of people's presently held expectations, and Jim Dator developed a "generic" framework of such expectations. Polak's English-language translator Elise Boulding crystalized his analysis of historical patterns into two axes of essence/influence and optimism/pessimism, which Peter Hayward later reimagined as a facilitated exercise, the eponymous Polak Game. These imagistic research themes have infused the futures literature, and this influence persists in recent attention to the wider literature on social and sociotechnical imaginaries.

Nonetheless, Polak's principal assumptions betray the types of colonizations of space and time described by writers such as Linda Tuhiwai Smith and Walter Mignolo. For one, Polak based his breach-in-time declaration on the European-centered sequence: antiquity, Middle Ages, modern times. Also, as Polak's survey was constrained to images "sifted down" into Western civilization, it explicitly ignored non-Western cultures and their contributions. By the 1970s, this type of shortcoming was not lost on Elise Boulding, who commented:

"the next history of the image of the future will have to record the images of all civilizational traditions."

These shortcomings do not undermine Polak's central hypothesis that cultures rise or fall based on the vitality of their images, but they do require that we carefully reconsider the assumptions and findings of imagistic research. What might be learned from a Polak-style macrohistorical survey of images from across the world's cultural traditions? How has the "meaning of time" been composed? In the 2020s, we are in a better position to grapple with such questions than Polak was in the 1950s. With regard to meanings in and of time, we might draw upon the writings of Vine Deloria, Jr., C. K. Raju, Lesley Rameka, Rasheedah Phillips, and many others. Nonetheless, entangled as we (many of us) are in modern presuppositions, the challenges remain daunting. As Vanessa de Oliveira Andreotti emphasized, "Every time we try to think outside the box, we're probably reproducing the box in a different way."

Seeking to not reproduce the box, we return to the imagistic research themes described above. We focus in particular on the Polak Game as an example of the self-reflexive practices advocated by Andreotti and colleagues. We review variations on the game that have been published to-date and propose additional ones. This type of gameplay can be used to bring temporal understandings and assumptions into dialogue with temporal investigations that reflect indigenous, Afrofuturist, feminist, and non-Western positions. Such a dialogue might then point to opportunities for generative interweaving, for braiding.

Our talk will not offer a systematic review of imagistic writings, nor a systematic critique of them. Rather, with this reconsideration, from our own positions, and as called for by Anticipation Conference organizers, we aim to better understand possibilities for decolonizing anticipation. This presentation is based on work initiated with students Ameenah Carroll, Inbar Sharon, and Madeline Silberger-Franek in the 2021 Strategy+Foresight course in the Collaborative Design MFA / Design Systems MA programs at Pacific Northwest College of Art, Willamette University.

Deep Listening: Communication Infrastructure for Collaborative Anticipatory Governance in Climate Adaptation

Tomás Guarna, Eric Gordon, Yihyun Lim and James Paradis

This paper introduces Deep Listening, a novel research agenda for the study of the communication infrastructure within the planning and implementing of climate adaptation procedures, which can support anticipatory governance (Guston, 2014). It argues for the urgency to develop a systemic approach in understanding how frontline communities (those, often Indigenous groups, that experience the effects of climate change first) interact with mediating institutions. Deep Listening is presented in five components: 1) knowledge sharing (mutually agreed upon protocols for data production and use); 2) holding space (co-creating spaces where institutional actors and communities can exchange, learn from each other and discuss); 3) the production and sharing of climate imaginaries (where local or Indigenous knowledge and community values are respected); 4) sensemaking with a diversity of perspectives and scientific data; and 5) evaluation and monitoring support to assure accountability and to assess quality of information. Based on a literature review of adaptation studies, the case is made that the deep listening approach can

enhance the sense of procedural justice and mitigate maladaptive outcomes.

Monument Public Address System AR
Meredith Drum

Monument Public Address System AR is an interactive augmented reality (AR) documentary revolving around an expanding collection of audio interviews about the past, present, and future of confederate and colonial monuments across the United States. The interviewees include activists, scholars, students, planners, community organizers, and other artists. Some have discussed feelings of exclusion when they see confederate and colonial imagery. Others have evaluated the symbolic violence of the monuments in relation to ongoing racist systems. And others have described potential liberatory sculptural works as replacements.

The author-artist's goal in creating this project is to engender thoughtful individual and collective experiences and to support critical and ongoing engagement with public memory and the political, social, and cultural processes responsible for public spaces. As Ana Lucia Araujo, historian and professor at Howard University, writes, "All monuments emerge and disappear because of political battles that take place in the public arena. Likewise, public memory is always political" (Lucia Araujo, 2020).

Anticipating Apocalypse: Exploring Areas of Convergence Between the Cold War Generation & the Climate Change Generation. What does Survival Mean?
Laura Oconnor and Lena Dedyukina

What impact does anticipating apocalypse have on the psyche of a child? Throughout the 1950s and into the 1960s, children in the United States and Canada were performing "duck and cover" drills under their school desks. Existential anxiety was the norm – after all, the nuclear war with Russia was impending. Fast forward to 2021, three-quarters of children and young people believe that "the future is frightening" as a result of climate change, with 45% reporting that their eco-anxiety emerges on a daily basis (Hickman, et. al., 2021). War and climate change are, of course, not the same. But this is not the point of comparison within this work – we are looking to examine the areas of convergence between the collective and unending existential anxieties faced by both generations as children & young people living in (what many would consider to be) pre-apocalyptic times. Within this theme, we seek to explore the broader question of survival and its meaning across social divides. More specifically, we are asking the questions "what does it mean to be in a collective 'survival mode' in the fact of an apocalypse & what does "survival" mean across race, class, and gender?" What role does formal (mis)education play in propagating unhealthy anticipatory narratives in the face of apocalypse? Finally, how have top-down political narratives influenced collective apocalyptic anticipation?

The Anticipation Conference asks, "what is the role of emotion– delight, serendipity, surprise, anxiety, dread and wonder– in anticipatory thinking and practice?" Our research question centres around the role of emotion and psyche in anticipation, particularly existential anxiety, for young people and children. We seek to explore the feedback loop between collective anxieties and collective understanding(s) of the future. Moreover, the conference also asks, "what is the role of educational institutions in fostering capacities for anticipation and for critique of anticipatory work?" We seek to ex-

plore the role of early childhood messaging through educational institutions in perception of apocalypse, development of anxiety, and how that builds upon pre-existing institutions of marginalisation. On this note, our idea also seeks to explore the plurality of anticipation mentioned in the conference themes – survival looks different throughout the scale(s) of privilege. On a broader note, the question of apocalyptic thinking and (lack of) futures is a growing conversation on both a social and academic level. This is a body of work to which we seek to contribute through this New Ideas session.

We seek feedback on the viability of this idea being narrowed into a research paper with a more target question of exploration. We also seek feedback on additional sub-themes that could be explored within our wider-identified area of "generational apocalyptic anxiety studies," particular through a global lens, outside of North America. We would also appreciate feedback on the viability of an intergenerational dialogue project of those from the Cold War-era & modern-day "Gen Z" facing regular and pressing existential anxieties.

1:00-12:30 (Phoenix)
Curated Session: Speculative Storytelling as Transformative Practice: Reimagining Narratives of Displacement
Barbara Adams, Hala Malak, Jane Pirone, Lauren Parater, Cian Mcalone and Shanice Costa

This ongoing research project is actively engaged with the Innovation Service at the UN Refugee Agency (UNHCR) to explore storytelling and speculative fabulation as world-building practices. Building on a collaboration beginning over a year ago, our work engages art, storytelling, design, and the social sciences to address alternative

approaches to humanitarian response, asking difficult questions about aid work and the futures it shapes. We have been developing generative methods, frameworks, artifacts, and collective narratives with UNHCR's Innovation Service that reimagines their work with displaced people.

11:00-12:30 (Phoenix)
Curated Session: Emotion and Futures Literacy: how anticipatory capacities support communitarian resilience
Monica Mendez, Barbara Ferrer and Aline Roldan

Latin American strategic foresight practitioners present a curated session on '4. Critical Anticipatory Capacities' addressing What is the role of emotion in anticipatory thinking and practice? by exploring how workers of NGO's and the communities they serve can benefit from experiential practices of futures/foresight.

The session's goal is to provide the conference participants the opportunity for insight about the role of emotions, the body, and experience in imaginative capacities. The session will include the presentation of latin american case studies in the first part. The second part will be a dynamic and participatory experience that invites embodied exploration of the role of body-emotion and to discover its relationship with anticipatory capacities. Sharing practices that allow people to trigger imagination and resilience.

The goal will be to sensibilize foresight/futures practitioners to address audiences as facilitators, social workers, non-profit organizations, and communities. What is the space emotions and their embodiment have in foresight practice and how can this understanding

enhance our work with communities? How are the emotions and experiences of community members influencing their capacity to imagine different futures? Imagination and hope can be catalyzers of community empowerment, helping people to think about themselves as holders of a right to a better possible future. However, how to trigger imagination in communities or groups who are under traumatic conditions imposed by social issues - like homelessness or domestic violence? How can we open the imagination when apathy prevails?

The session will be divided in the following steps:

1. Presentation of key findings from research and examples from different case studies. It will involve the theoretical exploration and acknowledgement of emotions when 'using' the future, and how they influence and are influenced by anticipatory systems and anticipatory assumptions. One of the case studies presented will be about the Homeless Workers Movement (MTST), a housing grassroots movement in Sao Paulo, Brazil, and how they create the conditions for opening up the collective imagination through their organising practices. At the end of this step, participants should be able to understand why foresight can be helpful in community development and the importance of making people visible to themselves to allow the flourishing of hope and imagination.

2. Practices to open up the imagination! Participants will be introduced to practical ideas and exercises that can be applied in their work with communities. At the end of this step, after participants have experienced the good practice, they will have an appetite to learn more about community-based foresight practices.

3. Closing open plenary for participants to share their experience of the session and ideas for theory, practice, and next steps.

11:00-12:30 (Phoenix)
Techniques Session: Rehabilitation Futures Critical Worldbuilding Workshop
Laura Cechanowicz, Marientina Gotsis, Elizabeth Hogenson and Julie Lutz

"Our history begins in the year 2028. The asteroid scientists have warned us about for centuries makes impact creating a new epidemic. This asteroid carried mysterious energy and pathogens that affected every life form. The world adjusts to widespread injuries in people, nature, and infrastructure. Cities near the crash moved quickly toward a more Utopian society incorporating universal design. Cities farther from the crash believed the pathogenic health issues did not apply to them, so they were slow to integrate infrastructural and societal changes. Visitors can contribute letters and art from this future to our present so we can prepare for what is coming."

The Rehabilitation Futures Critical Worldbuilding workshop is a 90-minute workshop optimally designed for 20-40 participants. During this workshop, participants are invited to step into a speculative future in which an asteroid impact causes everyone on earth to develop a disability at some unknown time within their lifetime. This premise empowers us to rethink disability and rehabilitation as core, socially shared, and lifelong experiences.

This workshop utilizes Laura Cechanowicz's critical worldbuilding methodology, this form of worldbuilding is grounded in practices developed with a community of co-researchers at the University of Southern California's (USC) Worldbuilding Media Lab, led by Alex McDowell at the School of Cinematic Arts; as well as in collaboration with Marientina Gotsis, director of the USC Creative Media & Be-

havioral Health Center and co-director of the USC SensoriMotor Assessment and Rehabilitation Training in Virtual Reality Center (SMART-VR Center). Although it originated in the context of Hollywood production design, worldbuilding has since expanded to comprise a broadly collaborative process for designing holistic worlds. This process draws from research across multiple disciplines to produce deeply reflective fictional scenarios, resulting in various solutions or products. Worldbuilding utilizes a generative process in which prototypes and design outcomes emerge from intensively collaborative workshops with user groups. The outcomes of these workshops range from the familiar to the futuristic, emphasizing direct engagement with the needs of individuals and communities.

Laura Cechanowicz's extrapolations of worldbuilding into critical worldbuilding expand these practices by utilizing critical play, focusing on social justice and the ethics of credit in collaborative design, and active engagement with embodiment and identity. These workshops use storytelling tools in shared fictional worlds to help participants concretely and playfully challenge and inspire concepts of who they are, who they can become, and how they can shape their world. In this regard, the workshops are proactively focused on helping participants shape their health and wellness.

To begin the experience, participants 'meet' a cohort of interviewed thinkers via digital cards in Miro, from whom they can garner insights about foresight and rehabilitation from diverse individuals, ranging from patient advocates to practitioners of future ideation in academia and industry. Throughout the critical worldbuilding experience, participants have access to design research insights from these interviewees on digital cards as provocations for their own worldbuilding processes. We also view all participants as experts,

and so, if desired, they can leave their own thoughts, ideas, stories, and experiences behind to share with future workshop participants.

11:00-12:30 (Phoenix)
Techniques Workshop: Exploring the relationship between narrative structures and future imaginaries
Adam Cowart

The ubiquity of conventional narrative structures in futures imaginaries is a critical constraint to envisioning and enacting preferred futures. This workshop seeks to make explicit narrative sensemaking structures and explore alternative structures to create spaces for emergence. Story is one of humanity's oldest technologies which allows us to influence the self, the other and the environment. Story is also our gateway to the future, the means by which we transport ourselves speculatively to other times and places. Futurists have developed a sophisticated set of tools to craft scenarios - high level narrative representations of the future. Design Futures has made strides in instantiating artifacts, experiential encounters, and design fictions, in order to consider implications of possible futures with relatively high fidelity. There is a tension between anticipation as a discipline that cultivates openness and emergence, and storytelling which often seeks to exert control and narrative foreclosure.

In this workshop, participants will work collaboratively to reimagine the shape of future narratives. Participants will leave the workshop with a new appreciation for the relationship between structure and content in constructing stories about the future, and a practical futures storytelling method to add to their toolkit.

13:00-14:30 (Phoenix)

Curated Session: Anticipatory governance. Relations between temporality, the 'use of the future', collective sense-making and decision making

Gonzalo Iparraguirre, Lydia Garrido, Cecilia Palomo, Mónica Méndez Caballero and Juan Carlos Mora Montero

This session seeks to connect temporality studies with future studies and recent developments on anticipation and the 'use of the future' (Miller, 2018; Poli 2019). Contributions from sociology and anthropology of time enriched with a futures literacy framework to address the 'use of the future' based on anticipatory systems and complexity, deepens the understanding of the uses of temporality and its relation on anticipatory capacities and competencies. This session is framed in the UNESCO Chair on Sociocultural Anticipation and Resilience at the South American Institute for Resilience and Sustainability Studies, that contributes to the development and diffusion of Anticipation and Futures Literacy (FL) in Latin America and the Caribbean (LAC) working as a 'hub' for conducting cutting-edge action-research, training trainers, and engaging with civil society to support the development of anticipatory capacities, from inter and transdisciplinary approach. This session is an opportunity to broaden the understanding of how people, groups, institutions, systems and cultures involved in governance ecosystems use the ideas they have about the future to act in the present.

13:00-14:30 (Phoenix)

Independent Paper Session: Critical Anticipatory Capacities

Equality and Sustainable Development. The use of the future to achieve gender equality.
Cecilia Palomo

Gender equality as one of the Sustainable Development Goals, needs a platform strong enough to overcome the present crisis of inequality and violence against women and girls worldwide because predators' presence is everywhere:
-At home: According to the United Nations Office on Drugs and Crime (UNODC), 137 women around the world are murdered daily by a family member. -In relationships: Some 15 million adolescent girls (aged 15-19) around the world have been forced into sexual relations by their partners, ex-partners, boyfriends, romantic partners, or husbands. According to data collected in 30 countries, only 1% of them have sought professional help. -In "traditional" communities: 200 million women and girls between 15 and 19 years of age have undergone female genital mutilation. In most of these countries, the majority of girls were mutilated before the age of five. -In human trafficking and exploitation networks: Women and girls account for 72% of the victims. More than 4 out of 5 women are trafficked for the purpose of sexual exploitation. -In the street: In a multi-country study conducted in the Middle East and North Africa, 40-60% of women reported experiencing sexual harassment on the street (mainly sexual comments, harassment/following, or obscene stares). -In universities: A study conducted at 27 universities in the United States in 2015 revealed that 23% of female college students had been victims of sexual assault or sexual misconduct. -At work: A national study conducted in Australia shows that almost 2 out of 5 women (39%) who have participated in the labor market during the last 5 years have been victims of sexual harassment in the workplace. In 79% of the cases, the perpetrators were men. -On the Internet and

networks: One in ten women in the European Union report having experienced cyberstalking since the age of 15, including having received unwanted, sexually explicit, and offensive e-mails or SMS messages, or inappropriate and offensive attempts on social networks. -In public life and politics: In a study conducted by the Inter-Parliamentary Union in 39 countries in 5 regions, 82% of women parliamentarians surveyed reported having experienced some form of psychological violence (comments, gestures, and images of a sexist or sexually degrading nature used against them, threats or harassment at work) during their term of office. Almost half (44%) claimed to have received threats of death, rape, assault, or kidnapping against them or their families.

This representative sample shows how important is to start building new ways to approach gender equality as a capacity to detect, question, and eradicate stereotypes and prejudices in the private and public sphere, this is where future studies and especially futures literacy has a powerful role. How can communities be empowered to create and act on their own futures against gender-based violence? What impedes and enables engagement with a 50/50 future agenda? What's the political role of governments to promote progress towards a more just and equal future? Which worldviews, principles, or practices are involved in the unethical treatment of women and girls around the world, and how they could be eradicated? These are some of the questions where futures literacy as a capacity for personal and collective transformation has a lot to contribute.

In order to start questioning the way women and girls have been unfairly treated throughout history, a basic theoretical foresight on the use of the future provides us with a required anticipatory capacity to think about the future, while looking for solutions in the present.

This conception allows people, society, and governments to stop repeating more of the same when it comes to achieving substantive equality.

The Future Literacy Framework enables the correlation between ontological, epistemological, axiological, and practical dimensions about anticipatory systems and processes while cutting across different disciplines. This transdisciplinary knowledge base provides the possibility of co-creation on collective intelligence processes, something crucial when we talk about finding solutions to violent practices against women and girls involving society in all spheres and levels, because nobody can change something that is not considered to be wrong.

This approach allows reflecting on repetitive patterns that have not been effective in achieving equality, giving rise to reflection on new possible futures, building other narratives, and expanding possibilities in the present from a vision of the empowerment of women and girls towards a sustainable change in the world.

Plause: A Design Probe for Collective Futuring of Work
Sanika Sahasrabuddhe
Sohail Inayatullah argues that a creative minority (Inayatullah, 2008) often shapes the most broadly and commonly heard narratives of the future. Several frameworks in Futures studies provide a foundation to make abstract futures more tangible, giving design research an opportunity to facilitate, create and stage scenarios of the future that are preferable for those most impacted by a rapidly changing future. One such framework is the Experiential Futures Ladder that aims to provide material for 'participatory world-building' (Candy & Dunagan, 2016) and 'bridge the gap between the abstract possible futures' (Candy & Dunagan, 2016) and lived experiences of the present. This

research explores and applies the role of qualitative design research methods in making futuring accessible, experiential, collective and democratic. In this research inquiry, the rapid changes in the nature of work experienced by several workers during the COVID-19 pandemic was scene 'moment of change' to facilitate conversations about an ideal future of work through 7 qualitative, contextual inquiries with workers who had faced changes in their work as a starting point to craft a design research method to that connected personal futuring with visions and hopes of an ideal future they wanted to experience.

The outcome of this inquiry is a design method called "Plause". The game has four key elements: values, trends, change and encounter. It urges players to reflect on the values that drive them to work, imagine trends and change that may emerge in the future and stage hypothetical encounters that can inspire shaping of equitable policies to mitigate unforeseen change.The design and evolution of this design method or conversational game started by asking 'How can design tools enable precarious workers to sense change, consider its impact and prepare for it? Plause is designed to be a conversation mechanic or tool to stage scenarios and understand how players hold and change their values in the face of change, and through that, learn about what matters to them. It is meant to be a tool that facilitates futuring as a form of participation to be represented in the future.

In further steps, an important evolution for this design method would be experimenting and trying in scenarios of organizational change or changes in governance in private companies or civic settings, where including the voice of the represented while overcoming a present-bias to shape the future of work or any other scenario that involves the collective, is important.

Developing Pragmatic Imagination through Science Education

Steven Zuiker, Bregje Van Geffen and Michelle Jordan

This paper explores the role of imagination in science education. Einstein argued "Imagination is more important than knowledge. [...] Imagination embraces the entire world, stimulating progress, giving birth to evolution. It is, strictly speaking, a real factor in scientific research" (Einstein & Shaw, 1931/2012). Rather than an alternative to reason, we consider imagination as a necessary complement (Pendleton-Julian & Brown, 2018), particularly in relation to socio-scientific challenges shaped by complexity and emergence like climate change. The intertwined drivers and complex dynamic structures of global human activity increasingly influence earth systems, generating emergent phenomena at multiple scales, often with unintended (and unanticipated) consequences. As global citizens, youth are future leaders of families, communities, and institutions who will fundamentally shape collective climate efforts such as transitions to post-carbon energy systems. Yet, contemporary science education typically provides youth with substantive opportunities to understand earth systems and human activities only in terms of past and present efforts towards sustainability, resilience, and regeneration. We contend that an equally important opportunity in science education is to understand human activity as being guided not only by reasoning about the past and present but also by imagining possible futures. Societies face changing relationships with the future; optimism and ambition towards the future seem diminished, if not lost (e.g., New America Foundation, 2011). That is, people often struggle to construct plausible, let alone desirable, futures (Bai et al., 2016). Imagining desirable futures challenges individuals to examine what actually exists in terms of what potentially might and, in so doing, to amplify possibilities for action in the present. By coupling reason and

imagination, science education invites youth to problematize energy transitions prospectively in the context of still-evolving material and social interdependencies rather than retrospectively in terms of linear cause-and-effect relationships (Pendleton-Julian & Brown, 2018). Against this backdrop, our paper reports the design-based research study. We share the design of a pragmatic imagination workshop then present complementary analyses of the social processes and collaborative products through which participating youth developed pragmatic imagination in an informal science education program about the role of photovoltaic innovations for accelerating energy transitions.

Uses of time and chrono-politics. Agendas, governance and future in Latin America.

Gonzalo Iparraguirre

Social instability and economic inequality in Latin America, clearly manifested in political agendas, can be interpreted from understanding the uses of time and temporality imposed by chrono-politics. The official uses of time, such as time zones, the regulation of work schedules, schooling, vacations, retirement, are all state devices that condition the social uses of time and the right to time, that is, the temporalities of the citizens affected by such regulations. By analyzing the link between governance imaginaries and their regulatory dynamics of the uses of time in terms of cultural rhythmics, it is possible to characterize social groups beyond the geopolitical limits of cities, countries or organizations and to detect a common problem: the presence of the past. In this context, this paper proposes to reflect on modes of anticipatory governance that consider designing and implementing public policies on the social use of time considering

the value of the presence of the future in any decision-making process.

13:00-14:30 (Phoenix)
Curated Session: La construcción de inter y transdisciplina para una Gobernanza

Anticipatoria del Agua
Juan Carlos Mora Montero, Néstor Mazzeo and Lydia Garrido

En América Latina la gobernanza del agua presenta importantes cambios asociados a los grandes desafíos de la sostenibilidad, así como el impacto de múltiples crisis en los diferentes usos de la misma como el abastecimiento de agua para consumo humano, el riego, la generación de energía, el tratamiento de aguas residuales, el turismo acuático, entre otros. En este contexto, los sistemas de gobernanza evolucionan paulatinamente desde modelos fragmentados y jerárquicos hacia formatos más integrados y participativos. En este proceso, el ámbito académico-técnico transita lentamente construcciones interdisciplinarias gracias a los cambios del sistema de gobernanza y a través de diversos instrumentos de política científica, cambios condicionados para la relevancia del tema y la dinámica de crisis. Los abordajes transdisciplinarios y la interacción entre sistemas de conocimiento y saberes son muy incipientes o simplemente ausentes, dificultando seriamente la construcción de capacidades anticipatorias para la adaptación, resiliencia y transformación. Las capacidades anticipatorias traducidas en prácticas sistemáticas son muy reducidas y generalmente entendidas dentro de un paradigma lineal, mecánico y reduccionista. Esto dificulta la creación de conocimientos desde distintos lugares del saber (transdisciplina) ya

que tiende a fraccionar la 'realidad', lo que dificulta también articulaciones diversas (entre ellas la co-creación de conocimiento) con impacto también en las problemáticas de coordinación, ya que los paradigmas reduccionistas de manera 'natural' (por la ontología de las relaciones de modelado epistémico) reproducen 'fragmentación'. La sesión se propone reflexionar e intercambiar conocimientos sobre los desafíos mencionados tomando como punto de partida casos de América Latina (proyecto Governagua: Brasil, Argentina y Uruguay) y el caso de Costa Rica, pero no se restringe a este espacio territorial, por el contrario, es abierto a todos los ejemplos que transiten cambios en los sistemas de gobernanza similares. Entendemos que transdisciplina y capacidades anticipatorias extensivas sociales están entrelazadas, en ese sentido, son parte del problema y por lo tanto de la solución. El objetivo central del encuentro es comprender las dificultades que se identifican para avanzar en procesos de co-diseño y co-creación de conocimientos que permitan propiciar cambios y transformaciones de la realidad desde la anticipación como capacidad y competencia que se vincula con un uso alfabetizado del futuro. En otras palabras, cómo se puede generar conocimientos que se conecten con el nivel aplicado para facilitar procesos que fortalezcan capacidades y competencias para la sostenibilidad ecosistémica, distinguiendo y articulando las mejores posibilidades para evitar, mitigar, adaptar o transformar perturbaciones o shocks, conocidos como desconocidos, desde la pro-acción (incluso cuando las condiciones imponen reacción).

13:00-14:30 (Phoenix)

Curated Session: Imagining Canada's Future's Ideas Lab: Canada and the Circular Economy

Thérèse De Groote, Ursula Gobel, Jury Gualandris, Geoff McCarney, Emmanuel Raufflet and Bala Nikku

Given the unique contexts of foresight and futures practices, Anticipation 2022 provides an important opportunity to share and hear from researchers and policy makers in leading research funding strategies with innovative and evidence-informed foresight. This year's focus on justice, new spaces, new voices and new approaches is conducive to interdisciplinary engagement, content and dialogue. SSHRC has a long history of futures thinking in research funding and public policy, going back to strategic themes and priority areas in the 1990s through to today's Imagining Canada's Future initiative. The proposed panel presents a unique Canadian perspective informed by our involvement in collaborations that bridge research, policy and practice to address global and future challenges.

Global challenges, such as those identified through SSHRC's Imagining Canada's Future initiative, are best addressed through proactive, interdisciplinary collaborations. The Imagining Canada's Future (ICF) Ideas Lab* is an exciting, new two-year pilot program designed to encourage innovative research partnerships and projects. By breaking down methodological barriers and empowering participants to explore new approaches to research, the ICF Ideas Lab seeks to aid knowledge sharing and provide foundations for future interdisciplinary projects addressing an emergent global challenge.

In 2021 SSHRC launched and ICF Ideas Lab funding opportunity on "Canada and the Circular Economy" under its global challenge of "Living within the Earth's Carrying Capacity". The topic was identified in 2019 as a result of a knowledge synthesis grants competition in 2017 to address the future of Canada/UK Trade relationships.

Increasingly, Canadians are concerned about the environmental impacts of existing systems of production and consumption. The circular economy offers a sustainable alternative to the current, linear model of production-consumption-waste. Circularity focuses on getting as much value as possible from resources, while eliminating waste and greenhouse gas emissions at all stages of production. The circular economy also addresses deeper issues around consumption, human behaviour and our relationship with the natural world.

Ideas Labs create new research collaborations that transcend institutional and disciplinary silos and encourage different ways of thinking and are therefore well suited to addressing these challenges. This panel will examine the recent roles of how foresight informs research, knowledge synthesis and mobilization to address a global challenge, results of which may enable collective action and inform policy and decision-making across sectors. It seeks to demonstrate how a proactive futures-oriented research agenda addressing emerging and future challenges responds to this year's themes of "How can futuring and anticipation be a shared public good?", "What is the role of educational institutions in fostering capacities for anticipation and for critique of anticipatory work?" as well as "How do community and organizational infrastructures promote futures thinking and anticipatory capacity building?"

13:00-14:30 (Phoenix)
Techniques Workshop: Investing in Futures: A Worldbuilding Game
Sarah Rothberg and Marina Zurkow

Investing in Futures is a playful world-building framework, developed and used by artist/educators Sarah Rothberg and Marina Zurkow since 2016. The framework relies on techniques including constraint-based design, experiential learning, and backcasting to inspire systems-oriented imaginings of desirable (yet often absurd) worlds, asking participants to work backwards to provide new visions for our present. IIF has been utilized in over 50 workshops in contexts ranging from conferences, colleges, and think-tanks. Recently, IIF has been supported by Rice University's Center for Environmental Studies and Princeton University's High Meadows Environmental Institute, developing the project for new contexts and with thematic content including Waste, Currency, and Ecospheric Cosmologies.

13:00-14:30 (Phoenix)
New Ideas Session

Anticipating and mitigating harms of AI research
Madhulika Srikumar

AI is an omni-use, potentially transformative technology, and as machine learning becomes increasingly advanced, the scale of its impacts increases correspondingly. The AI/ML (machine learning) community is facing difficult questions about how to publish research responsibly, to maximize the benefits while mitigating risks of malicious use, unintended consequences, accidents, and other harms. One of the main hurdles is the need for coordination - there is a broad spectrum of views on the issue, yet responsible publication norms will only be effective if they are adopted widely across the community.

In the past year, experimental developments have shown the AI research community beginning to come to terms with the potential negative consequences of their research. In 2020, the NeurIPS machine learning conference required all papers to carry a "broader impact" statement examining the ethical impacts of the research. In another first, Nature Machine Intelligence began to ask submissions to carry an ethical statement when the research implicates identification of individuals and related sensitive data. These approaches, while commendable, are far from broadly-accepted with open questions around optimal implementation. This uncertainty only makes the need for the community to come together to codify best practices on anticipating downstream consequences, more urgent.

Integrating critical reflection into the research process needed to proactively mitigate the harms of AI will require a coordinated community effort, including experimentation with ethics review processes, research on the impacts of such processes, and venues where diverse voices within the AI/ML community can share insights and foster norms.The pace of AI research and its potential for misuse means we cannot wait long for a much broader commitment to conduct ethical review across venues.

However, the AI research community is not the first applied sciences field to consider the impact of research on society - lessons on anticipation from other dual-use fields can deeply inform AI researchers. Receiving feedback on building capacity to anticipate, existing tools that can encourage better reflexivity in technology design and research, and general strategies to get better at anticipation will be very valuable. Especially feedback around how to facilitate anticipation at scale among young researchers will be interesting to hear more about and is deeply in line with the themes of the conference.

Another point of interest is critically thinking about anticipating the impact of AI on marginalized communities.

Night Walks: memory, dread, and sense-making through networked environmental memory
Aaron Oldenburg

This is a work-in-progress multipart videogame titled Night Walks. It is a series of interconnected software objects that are intended to explore expressive, environmental entities (AI "minds" that exist on the level of the landscape). On a private server, the players' actions are recorded, and Night Walks, in its various client instances, calls up this memory data and responds to it.

Night Walk 1 is a virtual reality landscape, where the player is on a balcony surrounded by and isolated from silhouetted neighbors. The environment records certain actions the player performs, currently the act of grabbing animated forms out of the landscape with their hands and placing them. This data is sent to the private server, to be interpreted by Night Walk 2, 3 and 4.

Themes are not explicit, but the design choices come from feelings related to anticipation of future collapse and instability, the overwhelming power of nature, and grief from memories of imagined alternate futures. Readings related to post-human worlds inform the work as well. The data on the cloud serves as a form of environmental memory. The game reacts in abstract and unpredictable ways to the players' behavior.

This project is a place to process and reflect on these feelings. However, indirectly, art like this can be a part of action. Panu Pihkala's article "Climate Anxiety" (2019) argues that the process of feeling one's grief and related emotions leads to empowerment.

Night Walk 2 applies the data from the server to the reconfiguring of vignettes in a non-interactive 2D space. These are composed of images traced from my own photography. The act of tracing, rather than cutting out the images, anonymizes and disassociates them. This iteration is non-interactive, a form of electronic dreaming influenced by the gameplay of others. In an installation environment, the player is invited to move between these different software mediums and contexts, returning to the lived world in between.

In Night Walk 3, the sound of rain activates a non-visual landscape. The player wanders through 3D spatialized audio of a city-turned-forest. Audio events are triggered by network data: ambiguous sounds, memories that assume the scripted and complex behavior of wildlife entering and exiting the player's world.

Night Walk 4 is the least realized, and might not be discussed.

Night Walk 5 is a self-playing, text-based game. The word scroll on the screen follows an artificially-intelligent "player" in a forest environment. Irrational movement and choices are inspired by Robert J. Koester's search and rescue manual, Lost Person Behavior. These behaviors will trigger new data to be uploaded to the server which other software objects in the series will use.

Anticipating Sustainable Value Creation: The Generative Promise of Social Accounting

Elizabeth Castillo

Anticipation—the use of a predictive model of a system or its environment that promotes state changes consistent with its predictions (Rosen, 1985)—is a growing topic of scholarly interest. The concept has been applied to diverse disciplines such as philosophy, physics, biology, cognitive science, psychology, and engineering, (Poli, 2010), yet it has not been widely used in the field of accounting. This paper explores the implications of this oversight and how the emerging field of social accounting offers an anticipatory model to promote sustainable, inclusive prosperity.

Criticisms of conventional financial accounting include that it destroys generative potential in communities and organizations by failing to recognize intangible assets, resource flows over time, and recirculation across multiple scales (individual, organizational, network, community, and global). These gaps promote inequality and injustice by omitting environmental and social considerations as well as stakeholders such as animals, nature, and future generations (Dillard & Vinnari, 2017). In sum, financial accounting as an anticipatory model casts out the elements that make life meaningful and enable human flourishing.

In contrast, social accounting recognizes these elements along with human values and the interdependence of these variables in its model building. Social accounting's relational orientation facilitates endogenous resource creation by recognizing both tangible and intangible assets (e.g., social, moral, and natural capital) as proxies for in-

dividual, organizational, and community capabilities. Strategic infrastructure design choices catalyze and channel transformation of latent potential (e.g., spatial proximity) into realized actuality, e.g., the development of social capital, trust, and cooperation (Castillo, 2016). This endogenous resource creation makes growth and development possible by increasing materials (e.g., biomass, physical structure), network capacity, and information (Jorgensen & Fath 2004).

Socio-economic-technical progress become possible through continuous expansion and reconfiguration of resources in ways that counteract entropy (the tendency toward decay and increasing disorder) and producing negative entropy (decreased disorder) through self-organization, recombination, selection, and processing across different scales. The transfer of energy across scales over time enables production of increasingly higher qualities of energy, with quality being the ability to produce greater outputs relative to inputs (Odum 1971). This increased generative capacity promotes open-endedness, the ability to produce novelty continuously through variation, innovation, and emergence (Banzhaf et al., 2016). Social accounting's broader lens gives system designers, infrastructure architects, and futures thinkers new capacity to construct more functional anticipations and to perceive the expected information, overcoming current perceptual limits of financial accounting.

Forecasting climate change: equitable and inclusive policy solutions to a global challenge
Adriana Bankston

The Journal of Science Policy & Governance (JSPG) is an internationally recognized, open-access, peer-reviewed publication dedicated to elevating students, post-docs, policy fellows and young scholars in science, technology and innovation policy and governance debate worldwide. In September 2021, JSPG, the Center for Science and the Imagination at Arizona State University and the UK Science and Innovation Network organized a workshop on re-imagining positive climate futures, featuring authors who had previously published in JSPG's climate special issue on climate change solutions, and who created their own narratives based on published articles. Building upon this event, this New Ideas Session will discuss the latest ideas on the topic in relation to climate change solutions and solicit feedback on how forecasting could be applied to designing climate futures in a number of future scenarios around an equitable energy transition, climate-resilient agriculture, equitable policy design to accelerate just climate action, and global climate resilience. The presenter will describe a few such ideas from the special issue around a couple of scenarios, which relate to the topic of the conference given the topics of an equitable energy transition, climate-resilient agriculture, equitable policy design to accelerate just climate action, and global climate resilience. Broader societal implications of this work will also be presented, in terms of policy changes that can be applied to local communities, keeping in mind impacts on vulnerable communities and a diversity, equity and inclusion on these issues. The feedback sought will be focused on how futuring and anticipation in relation to climate change challenges can broadly benefit society and develop into a shared public good, but also how to ensure that we are including all voices and perspectives in this analysis and empower local communities to act on these topics. This information will be useful as we prepare for COP27 and seek to address future climate change challenges at different scales and make necessary policy changes as imagined by the next generation.

Futures of Circularity in Mexico City
Abril Chimal

The world annually generates 2,010 million tons of urban solid waste, per person and each day there is a per capita average of 0.74 kilograms. According to the World Bank1 global waste will grow by 70 Percent by 2050. Companies such as Starbucks2, Coca Cola3, Tetra Pack, and many industries (such as the fashion industry) have plans to become net zero waste companies between 2035 -2050. However, waste accumulation will continue increasing, without taking into account the waste generated during the COVID-19 pandemic in which the percentage has considerably increased.

The waste of the world's largest megacities is a massive sustainability challenge, and produces 12% of the world's waste alone4. The city that generates the second most waste worldwide is Mexico City.

Mexico City is the 5th most populated city in the world with 21 millones 581,000. Many live in a trendy district called Cuauhtémoc, which has a large number of cultural and recreational areas appealing for foreign tourists; but is also one of the districts that generates more garbage in the city. In this district, approximately 13 million tons of waste is generated daily.
Mostly since pre-hispanic era, Tepiteños have been the outcasts of the city and they have struggled to cling to and preserve their roots and customs. This neighborhood has survived by taking what is discarded and destroyed and has restored value to these discarded things. Before the terms "upcycle" and circular economy were created, they have embodied a culture where waste is transformed into value, which has allowed the neighborhood to survive until today.

The area's rich history of artistic expressions, combined with its imaginative ability to reuse materials and its geographic size, makes the neighborhood an ideal candidate to explore the futures of the circular economy as a cultural practice that indeed already exists, but which prefigures a global future in which the idea and definition of waste is transformed or even obsolete; and to understand what behaviours and knowledge which have been discarded by modernity and industrialization can be scavenged as a resource for all of humanity and to tackle the waste problems we face.

This research seeks to address the problem of waste in its root cultural dimension, by looking at cultural intangibles: meanings, narratives, behaviors, languages, images in which we can learn from the discarded cultural resources of Tepito. how discarded knowledge and behaviors can be "upcycled"? How can what has been discarded by modernity be reclaimed in the present? The project seeks to recover pre-industrial, pre-colonial and pre-modern images, knowledges and voices as a resource to present and future generations. In upcycling cultural resources it seeks to find narratives to design more vibrant societies that are plural in their possibilities: "thinking about design from the political ontology also allows us to determine its relationship with the decolonial project of moving towards 'a world where many worlds fit'" (Escobar, 2016, p. 72)

Post normal science in backcasting processes: Anticipation in Climate Change
Roque Pedace and Maria Elina Estebanez

Post Normal Science (PNC) and the extended peer communities concept that belongs in it are being considered in Climate Change social

and political studies as a tool for anticipation management.High stakes, uncertainty in facts, urgency and and conflicts with regards to values are the conditions for PNC, the four of them present in Climate Change. Scenario building for Climate Change management is now a space for public participation and is considered a shared public good not left to experts but put forward in participatory processes similarly to other Commons.. Eg futures are being debated openly in the Nationally Determined Contributions established in the Paris Agreement. Coproduction of climate policy by decision makers and experts is extended to include new peers coming from all walks such as social movements: youth as in Fridays for Future, trade unions as in the Just transition initiatives already included in negotiations.Gender and food constituencies are also nurturing extended peer climate communities. The concept of sociotechnical imaginaries ,i.e. future oriented visions of connected social and technical order is used to identify anticipation in the narratives and actions of these communities.

Consumer sovereignty both in present and future or even multicriteria analysis are no longer the ultima ratio for policy prescription in backcasting (hybrid of planning and prospective studies) processes happening all over the world and being supported by climate scientists as well. Ethics in futures considerations is increasingly relevant in IPCC reports. Strong sustainability as opposed to perfect substitution of capital forms in intergenerational equity approaches is parallel to increase in participation and reckoning of values from different constituencies. Dystopian climate futures are no longer accepted due to prevailing cynical realism in negotiations and dirty irrealism in culture, eg as in science fiction, but contested with thorough alternatives, eg early climate action versus overshooting and future compensation by negative emissions. Scientific controversies and uncer-

tainties can be dealt with in the open: eg .How much and how fast is Nature to be restored?

14:45-16:15 (Phoenix)
<u>Curated Session: Engaging New Voices in Anticipatory Conversations</u>
Jasmine Jones and Allan Martell

Who participates in Futuring? In their paper "Who Gets to Future?" Tran O'Leary and Zewde illustrate ways that, in a participatory design setting, community members from groups underrepresented and marginalized in traditional and "professionalized" design feel unable to exercise true agency in the design process (O'Leary et al, 2019). In that particular case study, the underlying tensions of structural racism made it difficult for Black community members to make alternative proposals and expect results that aligned to their values. However, the authors point out: "Once the community separated from the rigid structure of the formal design process, only then could they propose design changes that reflected their lived experiences." Similarly, our work asks, "What are ways that we can foreground lived experiences to invite people from historically marginalized groups into technology-oriented design conversations and critiques?" "How can we foster an expectation of agency for newly included groups?"

Engaging underrepresented youth voices in futuring This session is a proposal and a demonstration. Including new voices in anticipatory conversations requires paying attention to the tensions and challenges of including marginalized perspectives. This session features an interactive workshop on designing for future memory as an

experiential demonstration of our approach to foregrounding lived experiences and promoting agency. As an introduction, the session curators will briefly discuss two projects that engage historically marginalized groups in agential, anticipatory work. Jasmine Jones will discuss her work with the Tech Ethics Roundtable, an initiative at Berea College (Kentucky, USA) to promote meaningful conversations among diverse students across campus and with the broader community about the impact of AI and other emerging technologies in their lives. The goal is to grow the number of people from traditionally marginalized groups who are able to cogently discuss technologies and advocate for positive impact in their communities. Allan Martell (Indiana University, USA) will discuss his dissertation work engaging youth in El Salvador in creating an interactive museum exhibit that memorialized the 1980s civil war. Allan adapted a participatory museum design approach to explore how this process can support descendants of survivors of violence in making sense of a traumatic past. While the subject of memorial exhibitions are social memories of violence, the act of remembering is future-oriented. In remembering, communities reflect on how the present resembles and differs from the violent past, and what to do with that difference, hence setting the groundwork for imagining a different future.

Session Activity: Reflect on the past to anticipate the future After the introductory presentation, session participants will be invited to participate in a paper prototyping activity to memorialize an aspect of their past in the future. (Participants can choose any subject important to them.) We will walk through a participatory design and reflection process similar to the design of an exhibition, where participants will be asked to envision a personal memorial accessed by their family members 50-75 years in the future. As part of this process, we will encourage participants to think about the ways that

memories might be shared in the future and consider interactive or responsive features of their memorial that might be common in the future.

This activity will be followed by reflective discussion. First, we will ask participants about the values at work in their design choices, from the content of the memorial to the interactive features they envision in the future (Friedman, 2013.) We will highlight ways that values align and differ among the diverse people in attendance. Next, we will ask participants to consider the social and cultural impacts of the memorial design and the necessary archives, sensing, or infrastructure needed to make this a reality. Participants will be encouraged to think about the immediate impact of creating a memorial as well as the long-term impact of having and maintaining a memorial.

The reflective discussion connects two layers of memory at play: 1) the individual frame, the level at which all memories are experienced; and 2) the public frame, the level at which collective meanings are negotiated, circulated, and contested. Reflecting on their own value systems at play in their design helps participants understand what are the stakes for each of them in their design choices, hence how the way they remember and the things they design are connected. The reflection about the social and cultural impact will then be a way for them to negotiate what their designs mean for them and people like them (represented by family), and what it would mean for others. The curators will facilitate these activities and discussions, demonstrating by example the practical and discursive techniques of inviting diverse experiences and perspectives into futuring conversations.

14:45-16:15 (Phoenix)
Independent Paper Session: Public Futures

Anticipating a More Equitable, Usable Conversation Design
Elizabeth Rodwell

Despite a dramatic increase in user experience (UX) roles held by those with social science training, UX professionals apply ethnography as a tool for contextually assessing the practices of targeted user categories ("personas"), and generally lack time for self-study. Meanwhile, academic evaluations of UX methods tend to be siloed within applied anthropology communities or favor a quantitative/lab-driven approach if presented in human-computer interaction (HCI) forums (Robinson et al, 2018). While HCI has a long history of academic dedication to the concept of usability (e.g., Baecker, 1989; Kasik 1982; Gould & Lewis 1985; Norman 1983; Shneiderman 1983), it lacks substantive discussion of UX as a social practice concerned with anticipating and reacting to the needs of others. It commonly fails to address the ways that UX as a business strategy contributes to the digital divide. In this paper, I will explore the ways that anticipation affects the decision-making of usability experts focused on conversational voice assistants (CVAs, like Alexa and Google Home) and conversation design. My analysis is based on ongoing ethnographic research and interviews with conversational UX professionals in the U.S. and Japan, focused on usability as a practice of daily negotiation. I argue that anticipation is one of the main discursive strategies of usability work but is complicated by a lack of system transparency and discoverability for voice assistants. While UX work, at its best, tries to avoid thinking for others by involving testers at all stages of the design process, it frequently designs towards a dominant user

model and constructs a form of conversational exchange that almost nobody finds usable (yet).

Frameworks for enhancing participation in scenario-based long-term urban planning and policy development projects using experiential futures
Johanna Hoffman

Engaging with uncertainty is an increasingly difficult problem in urban planning and policy development. One approach that professionals have frequently adopted to navigate growing scales, scopes and speeds of change is scenario planning. While valuable in identifying avenues with which to accommodate increasingly unpredictable conditions, scenario planning has real limitations, particularly in the realm of participatory engagement. A growing body of literature cites not just the need for more effective engagement tactics in scenario-based planning and policy work, but the growing importance of engaging emotional and sensory responses to potential future conditions. Given these shifting attitudes, the potential presented by the growing field of experiential futures merits more attention in the urban planning and development disciplines. This research investigates frameworks for enhancing participation in scenario-based urban planning and policy development projects using experiential futures tools, through the assessment of three case studies. Comparison of these projects serves to articulate experiential futures' potential utility in creating more participatory engagement in scenario-based urban development efforts.

Open Future Design: methods for co-anticipating the future

Joseph Corneli, Raymond Puzio, Paola Ricaurte, Charles Danoff, Charlotte Pierce, Vitor Bruno, Analua Dutka Chirichetti and Hermano Cintra

Groups of people sometimes discover unexpected ways to think about the future together. Ariyaratne (1977) tells the story of a rural group who were finally able to complete an important construction project. After 15 years of deadlock spent waiting for outside investment, they were called to a community meeting where they figured out that they could do the job with their own labor. As dialogue and inquiry gave participants new ways to articulate and develop their thinking together, the nature of the problem they faced became easier to understand and resolve. Here, we propose to use design patterns to structure anticipatory peer learning as a way to relate to possible future scenarios.

Life is intrinsically anticipatory (Poli, 2012; Poli, 2020) and prefigurative schemas shape how we learn (Spiro et al., 1996). However, as a society, we are not guaranteed to be able to produce a viable outcome out of disparate individuals' capacities to think about the future. Christopher Alexander and his collaborators in the 1960s and 1970s (Alexander et al., 1977) developed a pattern-based approach to architectural design that was meant to enable stakeholder participation. Patterns were seen to promote a natural or "life-like" quality found in traditional architecture, versus the artificial one that appertains to central planning (Alexander, 1965). The economist Elinor Ostrom related Alexander's pattern language to Arthur Koestler's notion of 'holons' (1973): stable components "in an organismic or social hierarchy, which displays rule-governed behavior" (Ostrom, 2009, p. 11). This analogy leads to the question: can patterns help us think about how institutions anticipate the future?

Corneli et al. (2015) added a "Next Step" facet to the traditional template used to communicate design patterns (Meszaros & Doble, 1997), with the implication that each pattern is imperfectly realized. We will argue that such anticipatory patterns can be used to promote the organic, vital quality of resilience—that is, "not to be well-adapted, but to adapt well" (Downing (2007); quoted in Tschakert & Dietrich (2010)).

To begin our exploration of how design patterns relate to futures studies, we refer to Schwartz (1996, Appendix, pp. 241-248), viz., his "Steps to Developing Scenarios." The process follows an outline with a striking similarity to a design pattern template. Both Alexander and Schwartz advocate the identification of driving forces in a context. However, unlike Alexander, Schwartz does not intend to resolve conflicts between the forces within a harmonizing design. However, Alexander also talks about 'generative patterns,' i.e., pattern languages considered as "a kit of parts … together with rules for combining them" (Alexander, 1968). Considering the future of the built environment, Alexander (1999) again takes inspiration from "generative schemes that exist in traditional cultures." The pattern Open Future Design serves a pattern language-in-development that begins to apply these ideas to co-anticipating the future The pattern method can be used for collaborative anticipation that embraces diversity. Such usage was already hinted at by Moran (1971), who wrote that "From the point of view of methodology, it is not so important how good each pattern is, but only that each one is transparent and open to criticism and can be improved over time." Alongside the two candidate examples above, with Next Steps and ellipses suggesting further patterns, another approach to anticipatory patterns replaces the "Solution" segment with "Possibility" (cf. https://pluriverse.world/).

As we consider the needs and interests of broad cohorts of stake-holders we can position patterns in counterpoint to Kostakis et al. (2015), who argued for a development model based on "thinking global and producing local." At the center of their vision is a global pool of designs, which are put into production in local Fab Lab facilities. By contrast, patterns for anticipatory peer learning contribute to decentering the design process itself. Patterns are primarily tools for thinking locally about particular contexts, relationships, conflicts and circumstances. Only secondarily and potentially does this lead to a shared global resource. Pattern methods primarily strengthen local forms of resilience, and can help identify healthy futures. Nevertheless, a language, and indeed a literacy, of anticipatory patterns could help local institutions understand the obstacles they encounter, and overcome them.

Generative patterns for Open Future Design recall Deleuze's remark that "the system must not only be in perpetual heterogeneity, it must also be a heterogenesis" (Deleuze, 2010). Following a script mal-adapted to local circumstances (as in the first part of Ariyaratne's story) is a dubious way to anticipate the future. We need methods for open and collaborative anticipation, towards the development of emergent strategies: plural and multiple.

14:45-16:15 (Phoenix)
Curated Session: Recovering the Human in Energized Futures
Clark Miller, Joey Eschrich, Justine Norton-Kertson, Brianna Castagnozzi, Elizabeth Monoian and Robert Ferry

The energy future is the human future. Throughout history, human societies and their energy systems have been co-organized in tightly

coupled arrangements: energy husbanded to serve human survival and thriving; societies and political economies organized around the production and consumption of energy (e.g., gathering of food and wood, growing and harvesting of grains, husbandry of draft animals, extraction of fuels, generation of electricity). Yet, modern tools for anticipating, modeling, and designing energy futures exclude consideration of human futures, with all of their social and cultural complexities and entanglements, their historical trajectories, and their politics and divergent ways of knowing. In a recent survey of the research literature on projected solar futures, for example, ASU researchers found only estimates of the size of solar deployments, with no attempt to anticipate or explore how future deployments of solar energy might be laced into the social, economic, ecological, or political arrangements out of which future societies might be built. Perhaps the most egregious example of this lack is encapsulated in the US National Academies study America's Energy Future (2009), which offers in its 800 pages no insight whatsoever into the future of America. Yet, despite their abject failure to engage with the human, energy futures nonetheless tell us much about both the sheer scope and scale of humanity's energy needs and the vast systems created— and necessary in the future—to satisfy those needs. Against this gap, two other forms of imaginative work can be contrasted. Among writers and artists, a diverse and growing international community of creatives has formed around the concept of Solarpunk, a neo-utopian exercise in envisioning "what the future might look like if humanity solved major modern challenges like climate change, and created more sustainable and balanced societies" (Solarpunkmagazine.com). The stories and imagery of the Solarpunk movement attempt to call into being, in the first instance, narratives of potential human futures powered by alternative, less destructive forms of energy than our current fossil fuel systems, organized in less destructive and more humane ways. By their very nature, So-

larpunk writes and paints pictures of energy grounded in the peculiarities of particular places and the lives of particular people—and of the kinds of futures energized in those places. Solarpunk stories share this grounding in place and people with community-based solar initiatives, yet they are often visionary, fictional, written about the distant future, and thus at best loosely connected to people living in concrete places today. Community-based solar initiatives, instead, are rooted in the concerns of groups of people who ask what can be done, here, now, today, with the limited sets of capabilities, resources, and imagination available, to set in motion a different course for the future. In that practicality is the power to make change real, to create alternative futures for energy systems and the energy-people hybrids who will inhabit them. And yet that very practicality is often deeply constrained by funders, solar system designers, government leaders, local electric utilities, and community members who all operate within deep-seated paradigms that draw clear boundaries around "what is possible," thus limiting the full exercise of imagination at the heart of community-based initiatives. Our goal in this curated session at Anticipation 2022 is to create a space for diverse participants to explore the possibilities for bringing together these three sets of capabilities to, on the one hand, enable richer, more diverse, and more fully considered visions of human futures powered by solar energy that can, at the same time, provide robust and valuable guidance to the design of future solar projects at all scales, from the community to the planet. The three organizations submitting this proposal are all committed to innovating and institutionalizing novel, profound, and more methodologies for exploring and engaging visions of solar-powered human futures. ASU's Center for Energy and Society and Center for Science and the Imagination have collaborated, over the past three years, to explore strategies for integrating energy engineering, research, and imagination in novel futures methodologies, captured in the books Cities of Light (2021)

and The Weight of Light (2019). For the past decade, the Land Art Generator has hosted design competitions that explore the use of renewable energy as public art, in collaboration with a diverse array of iconic global cities, generating fascinating pictures of potential alternative energy and human futures, e.g., Land Art in the 21st Century (2021), Powering Places (2016), and Regenerative Infrastructures (2013). Solarpunk Magazine is a new publishing venue for fiction and non-fiction writing about solar futures that has just published Issue #1, as well as hosting an exciting podcast, Solarpunk Futures.

Now is a critical moment in the energy transition, as the pathways set in place in the next few years will inevitably gather momentum and shape extensive financial investments over the next few decades. It is crucial to take this moment, therefore, to leverage all of our creative talents in the search for futures that are worth inhabiting for all people everywhere.

14:45-16:15 (Phoenix)
Curated Session: Technology and Climate Futures: Anticipating Carbon Capture and Storage
Ritwick Ghosh, Stéphanie Arcusa, Rajiv Ghimire, Janel Jett, Henry Seeger and Yoon Ah Shin

The role of technological innovations in addressing climate change is highly contested. One of the most divisive topics is the development and use of novel technologies for capturing, storing, or using carbon in the atmosphere. Such novel technologies show potential to curb atmospheric carbon accumulation and halt or even reverse the rise of global temperatures.

However, many of these technologies are presently untested at-scale, and the full range of risks and efficacies are poorly understood. Some argue that the focus on such 'technological fixes' dilutes the public urgency necessary to radically transform our energy systems and build new infrastructures (Carton, 2019). Others worry technologies deployed by large businesses—and without support from local communities will disproportionately harm those already marginalized (Batres et al., 2021). The premise of this session is that anticipating new climate technologies in the present requires not only scientific and engineering perspectives, but also engagements with interdisciplinary fields and broader communities.

The session will offer a platform for an open and inclusive dialogue around carbon capture and storage technologies. We will explore questions of timelines, scales, uncertainties, values, principles, and costs. These questions are relevant to understanding what structural and practice-based changes are necessary in governing technology and climate futures. The purpose of this session is not to come to a conclusive answer regarding CCS, but to disrupt some of the gridlock surrounding these questions.

14:45-16:15 (Phoenix)
Techniques Workshop: From Algorithms of oppression into AfroRithms of Liberation with Afrofuturism: Claiming Space in Future Worlds in the Pluriverse, real to imagined into the reel
Lonny Avi Brooks, Ahmed Best and Jade Fabello

How can new media, VR/AR, immersive experience design and games be deployed to activate better futures? We propose a techniques workshop using an imagination forecasting game we call

AfroRithms from the Future, a collaborative, design thinking, story-telling game that centers Black and BIPOC perspectives. 90 minutes is optimal and up to 45 participants is ideal. Technical requirements include providing our card decks, a wifi and computer access with a larger projection screen if possible with the internal game application we use with the game to amplify the experience. In groups of 4-5 players, we will collectively select two future tensions out of six tension cards to form a new world. You are travelers of the multiverse exploring possible futures and creating exciting new artifacts to send back out to all other parallel worlds. The game is simple. Have a conversation about the future and activate your radical imagination! The game ends when you as a collective have decided on the best artifact to share with the rest of the multiverse.

Our Black, Indigenous and People of Color (BIPOC) communities require tools to imagine and create engaging futures. Picture never seeing yourself in visions of the future and infrequently even as Black superheroes. Less than two percent of professional futurists are BIPOC. Globally, futures practices rarely consider BIPOC communities unless they are tied to corporate-oriented consumerism. Future visions of healthcare traditionally have rarely addressed race and gender, instead erasing core identities along with sacred ancestral community knowledge.

Afro-Rithms From The Future, a game centering BIPOC imagination, generates artifacts from the future--amplifying community futures to reveal solution spaces for BIPOC issues. Afro-Rithms From The Future as a forecasting game suggests that by changing the traditional white, patriarchal normative gaze of racism and lens through which we usually view the world, we aim to change the societal "game" to expand alternative perceptions of the world through Black and

(BIPOC) perspectives where Black and BIPOC futures are central and matter. The term Afro-Rithms is intentional to acknowledge the leading editing role that algorithms have attained especially on our social media platforms. We want to acknowledge the ubiquity of algorithms in our lives and ensure that Black Diasporic and Africana perspectives shape and create new algorithms to expand the aperture of cultural perspectives within our digital society. Afro-Rithms From The Future shifts our digital lens that usually reinforces, perpetuates dominant inequities to enable us to expand our range of possible and more equitable, liberating multiverses. Ruha Benjamin in Race After Technology: Abolitionist Tools For the New Jim Code refers to the persistent bias in algorithms as the "new Jim Code, the employment of new technologies that reflect and reproduce existing inequities but that are promoted and perceived as more objective or progressive than the discriminatory systems of a previous era". Afro-Rithms is designed to counter the new Jim code with algorithms of liberation.

In playing the game, we propose using it as a springboard to explore the question: How do we claim Black, Indigeous space in Virtual Reality (VR), in the metaverse? While Neal Stephenson's novel Snowcrash established the dystopian concept of the metaverse in 1992, one year later in 1993, C. Tsehloane Keto argued that the only way forward is a global pluriverse that respects our innovation and a non-hegemonic approach that embraces our humanity (Reynaldo Anderson, Black Angel of History exhibition, 2022). By focusing our attention on the power of the avatar, the graphical representation of a user's character persona in VR and its interaction within intentional communities created in VR, our aspiration is to embody the avatar with affordances or powers for liberation that in turn bring, and extend them back into the analog world. Claiming space in virtual set-

tings and VR has historically already encountered one of its most racist moments against a Black actor developing one of the most ubiquitous Avatar personas of all time: Jar Jar Binks. The actor Ahmed Best playing Jar Jar Binks in Star Wars we can assert was one of the first virtual iconically Black alien avatars that provided the CGI (computer generated imagery) imprint for all other virtual characters on screen to follow. Literally, the DNA of a Black actor and their intergalactic persona provided the technological pathway for precursors for virtual character development especially in film and arguably in VR.

This workshop connects to several of the conference themes as it aspires to decolonize futures by amplifying individual and collective agency in imagining the future to center traditionally marginalized voices and offer alternative visions of the future. How can we democratize community and organizational infrastructures to promote futures thinking and anticipatory capacity building? We envision games like this one to catalyze and engage communities in creating annual exercises in reflecting a network of imagination that can translate into legislative agendas and address societal challenges. We know that play in particular is a critical element of harnessing and augmenting the role of emotion in terms of feeling the future and having an immersive embodied and experiential journey to travel to the future and bring that future into the present. Our hope is that participants leave the workshop with an increased capacity to imagine the future and realize their own initiative to act as signals of the future as well.

TEMPE, ARIZONA, NOVEMBER 16

**4TH INTERNATIONAL CONFERENCE ON ANTICIPATION
TEMPE, ARIZONA**

NOVEMBER 16, 2022

09:00- 09:15
Conference Welcome | The Organizing Committee

09:15-10:00
Keynote | *Heila Lotz-Sisitka*
Expansive learning and possibility knowledge(s) for regenerative futures at the intersections of complex past(s)-present-future(s)

The possibility of regenerative futures is deeply intertwined with the potential of healing the Earth and her people. In many spaces around the world people are actively and creatively engaged in co-creating diverse regenerative cultures everywhere. At the heart of these movements and our abilities as humans to participate in the co-creation of regenerative futures (with the more-than-human world) lies possibility knowledge(s). Possibility knowledge(s) sur-faces many philosophical and methodological debates, most notably those associated with the limits of positivism and empiricist ontolo-gies, an over-reliance on naturalism in the sciences, and one-dimen-sional rationalism in the social sciences, as well as recognition of a need to remediate a colonial history of abyssal knowledge. In this

presentation I will explore the concept of possibility knowledge(s) in the education and learning sciences, arguing that possibility knowledge(s) offer important interstitial or liminal spaces for transformations and transgression towards regenerative cultures. Interstital or liminal spaces for possibility knowledge(s) are 'in-between' and transitional, and potentially transformative and/or transgressive. Possibility knowledge involves destabilizing categorical knowledge, and a turning of categorical knowledge into possibility knowledge, which opens a platform for expansive learning, or learning 'what is not yet there' (cf. Engeström), including how to co-create regenerative cultures and futures under increasingly complex crisis conditions. To concretise the deliberation on possibility knowledge(s), I will share some examples of how communities in southern Africa are co-producing possibility knowledge(s) for decolonial, regenerative futures via expansive learning processes, and the significance of possibility knowledge(s) in education and learning processes oriented in such contexts.

10:30-12:00
Independent Paper Session: Creative Anticipations

Using the ECOtarot to understand complex emotions surrounding climate change: A pilot project
Adriene Jenik

The project team consists of Adriene Jenik, MFA; Stacia Dreyer, PhD; and Erica Berejnoi, PhD candidate. Jenik conceived and developed the ECOtarot cards and the readings.
This paper shares the results of a pilot study investigating the experiences and meaning making of individuals who have taken part in an

ECOtarot reading. The ECOtarot is a public performance art practice of reading people's climate futures. Drawing from the public's general familiarity with tarot cards, ECOtarot cards are used to read one's climate future, using specialized cards, based on climate science that highlight climate change and sustainability issues. This project research explores the complex emotions elicited during this art practice. Past research has described potential benefits of climate change oriented visual art to the viewer (Roosen, Klöckner, & Swim, 2018), but a focus on performance art is lacking from the literature. This study aims to expands the literature.

Unlike traditional tarot readings, the ECOtarot reading discusses an individual's climate future as part of an immersive performance art piece. The cards of the ECOtarot deck update standard archetypes and interpretations from the original 78 card deck to reflect contemporary actors, values and symbols from our climate drama. The ECOtarot deck used to perform readings is printed on handmade, plant-based paper (agave and recycled cotton and linen), and hand-painted with natural pigments. Climate future readings are structured in "spreads" which align with the number of cards offered for interpretation.

Participants over the age of 18 were recruited to take part in the survey following a reading. Everyone who had a reading and met the age limitation were eligible to be part of the survey (n=25). Data collection occurred in three waves, after the project received approval from ASU's IRB. Wave 1 included our initial data and was collected via online surveys over a 2-day period at the EarthX event (April 26-27, 2019). The EarthX event is an "international, nonprofit environmental forum whose purpose is to educate and inspire people to action towards a more sustainable future" (EarthX, 2019). It is market-

ed as the world's largest environmental experience and there were over 175,000 visitors at the 2019 event (EarthX, 2019). Wave 2 data was collected 2 weeks after Wave 1; Wave 3 data was collected 12 weeks after Wave 1.

Through this project, we were able to better understand the emotions experienced during the ECOtarot reading through self-reported measures after the reading. All respondents indicated that they experienced at least one emotion during the reading. Many people reported feeling inspired, satisfied, and/or confident during the reading. Our pilot data supports the anecdotal evidence Jenik has collected over the years with over 1200 readings. People leave the reading with renewed focus and resolve about their journey in the midst of a changing climate; pointing to an important role for art and cultural practices in environmental education.

Anticipating Wellness: Collaborative Mythmaking and Engaged Rituals For The City
Trudy Watt and Coe Douglas

The research question this session addresses is: how might we bring the world-making power of highly ritualized and symbolically rich events such as the carnival to bear on matters of collective well-being in an era of existential risk? Our project explores the idea that a better world is possible - we only require the entry point to allow a sudden transition to another way of being. Our work is situated in the context of scholarship from the transition movement, feminist and care-oriented critical theory, design futures, existential risk theory, applied compassion, medical humanities and the built environment as a social determinant of health.

As we spiral through the anthropocene, caught in the long tail of a pandemic, how we live is more important than ever before. With the ecological crisis threatening planetary inhabitability and the reality of living through this time at the center of a parallel health epidemic worldwide, well-being is at the epicenter of a project to expand what we mean by "well" so that it includes not only individual wellness, but collective wellness, more-than-human wellness and also living with purpose and intentionality. Convergent existential crises at the scale we now face demand a mythologically-scaled, highly trusting and collaborative effort.

To this end, our research on transdisciplinary routes to collective well-being orbit the key mediums of speculative fiction and carnival. The carnival is the embodied and experiential medium of choice for working collaboratively towards living well in this age of crisis because, as David Graeber and David Wengrow put it in their just-published The Dawn of Everything: A New History of Humanity, carnivals allow "people to imagine that other arrangements are feasible, even for society as a whole, since it [is] always possible to fantasize about the carnival bursting its seams and becoming the new reality."

Living well is at the core of our project. More specifically, how we can age well, together, and within the built environment. We propose a re-visioning that shifts the question to ask: what kind of world are we aging into? To age well means nothing if the world is on fire. Therefore, any living well initiative must expand the container to include everything. As everything is aging, young and old, human and other kin, the planet, our buildings, our ways of seeing the world. We believe we can provoke change through disruption, speculative futuring, play, and the turning upside-down of our most basic, but pacifying assumptions.

Our inquiry involves examining movements that seek to flip reality in the wake of large-scale festivals in Milwaukee, the city of festivals. These carnival-like events and their accompanying ad campaigns that leverage idyllic visions of Milwaukee-past have the potential to birth new realities, shift paradigms of thought, plant seeds and spark new ideas about potential futures that are necessarily different from the ones we have come to accept as inevitable.

Any transformational anticipatory project requires a coalition of sticky collaborators - rhizomatic, able to ebb and flow, fluid, malleable to the conditions at hand—designers, architects, poets, dancers, composers, healers, helpers, performers of all kinds, futurists, pataphysicians, mystics and visionaries, people of all ages (because we all have skin in this game) and anyone who has a vision for a healthier future—and who is willing to stay with the trouble—in our cities and communities, and as a vast array of kin in the late capitalist anthropocene.

Trust is required to step boldly out of the comforts of our late modern lives that have lulled us into "it-could-be-worse" and that mid-80s Thatcher ingrained mantra that "there is no alternative (TINA)." Well, we believe there is. But we'll need people to take the leap with us down the spiraling rabbit hole into wonder and enchantment. When we enchant, we enliven and infuse everything with an urgent sentience that makes new potential collaborations possible. We'll need more than simply materialist solutions to make this work. The acts of worlding we observe and create are rooted in collective events, fractures and ruptures, while looking for the glitches that let in the light of future possibility.

The key inquiry of this session is: how can we build compassionate transdisciplinary teams that manifest new realities around purposeful living in Milwaukee, using story and carnivalesque event to re-mythologize this place, not only among its inhabitants but in the national imagination? Some aspects of this challenge that our work addresses are:

Current obstacles to living with intention, purpose and vitality across the lifespan, especially for older adults and under-resourced communities.

Indifference around well-being and mutual care in Milwaukee and surrounding areas.

Lack of clear strategies for a more proactive model of collective wellness.

The difficulty of in-between or transdisciplinary work within a system that values siloed ways of working.

Challenges around engaging community collaborators, whose expertise is essential but often under- or not compensated at all.

Prevailing values in systems of power that tend to marginalize care-oriented and humanistic work as "too soft."

Felting Futures / Futures Felt: A Living Arts-Based Inquiry by a Critical Futurist turned A/R/Temporalist
Roumiana Gotseva

This paper presents my first-person arts-based Action Research on anticipation and change in the conditions of change for decolonizing futures-to-come. Feminist politics and 'minor' politics are always entwined with questions of time, futurity, becoming, and the generation of the new where a more nuanced temporal literacy could help better theorize the many ways we think about time and the future because different ways of anticipating simultaneously enable and

disable, elucidate and occlude, and that creates differences that matter: some ways are more colonizing, more in the service of perpetuating what is, while others open horizons for diverse lines of flight (Deleuze & Guattari, 1991/1994).

My project is grounded in a critical posthumanist (Braidotti, 2013) and feminist new materialist understanding of the entangled space-timemattering of the world and my emergence within it, how our desires can be co-opted (though never permanently) by current regimes of control, and how to think the interstices and spacetimes of possibility for open, decolonial futures by attending to the multiple temporalities, affects and materialities in a present thick-as-felt. It is a critical and affirmative feminist post-activist minor inquiry which aims to swerve away from current dualisms by embodying the rhizomatic movement of grasses, water lilies and wasabi plants with underground and underwater root systems that grow in vectors without origins or destinations.

Unlike the arborescent structures of 'royal science', rhizomes are nomadic, creative and subversive – like weeds. As an ethico-onto-epistemology, it necessarily draws on post-qualitative and experimental methodologies of inquiry (e.g., Lather & St. Pierre, 2013; St. Pierre, 2011, 2013; Richardson & St. Pierre, 2005) – and plays with different conceptions of time - challenging the dogmatic, common sense, representational, "everybody knows" (Hein, 2017) image of thought. In my work, professionally and academically, I'm interested in disrupting commonsensical assumptions of how things ought to be because such commonsensical assumptions have mostly proliferated interrelated ecological and social 'accidents waiting for a place to happen', as evidenced by the current Russia/Ukraine crisis. Experimentation, open-ended processes that allow something genuinely new - some-

thing fugitive - to come into being (as opposed to neoliberal capitalist 'nextness') means for me breaking with the dominant linearity of past/present/future and freeing desires, intensities, and flows to improvise the unforeseen.

And what is the craft of the nomad? Felting. Felting is a textile practice produced and used by many non-Western (e.g., Central Asian) cultures for rugs, clothing, yurts, and decorative arts. As the story goes, my ancestors were a mix of the nomadic equestrian Bulgar warrior tribes that flourished in the Pontic–Caspian steppe and the Volga region during the 7th century AD, one stream subsequently merging with previously settled Thracian and Slavic tribes to establish the First Bulgarian Empire in 681. The etymology of the ethnonym Bulgar is believed to derive from the Proto-Turkic root *bulga- ("to stir", "to mix"), which with the suffix -r implies a noun meaning "to become mixed". Other scholars have added that bulğa might also imply "stir", "disturb", "confuse" and some interpret bulgar as the verb form "mixing". Thus while a "mixed race" theory is one possibility, scholars consolidate around the interpretation that "to incite", "to rebel", or "to produce a state of disorder", i.e. the "disturbers" was a more likely etymology for migrating nomads.

'Autofeltnography' is my arts-based practice of reflective, reflexive, diffractive and generative felting/writing. As a Bulgarian, I take my practice of autofeltnography to hold this double meaning of "bulgar": both 'mixed' (impure) in an Anzalduan and Lugonesian sense of 'mestiza' or 'curdled' subjectivity – as well as 'disruptive' in a post-activist sense of problematizing the status quo and unsettling foreclosures for the openness of new horizons. "To unsettle something is to open it up to possibility" (Springgay & Truman, 2019). It's a kind of 'carnal knowing' of travelling nomads – we are rooted in

our 'felts' but we flow. Movement is the signature mark of the no-mad – yet she isn't homeless. She is 'unhomed' (Bhabha, 2002) and creates a home in the interstices between art, research and temporality – a reformulation of a/r/tography. This is not only a practice of the in-between for intentionally styling an active subjectivity-in-process but also a bridge toward constructing 'minor' affective solidarities, alliances and futures in the folds of old assemblages for worlds-to-come.

When my hands are busy, my mind relaxes and thinks differently. As a relational practice and method, autofeltnography engages the mutuality between the human and more-than-human world, organic and inorganic matter, and the elements: water, earth, fire and air. Becoming-animal, becoming-grass, becoming-rain, becoming-felt. The 'auto' here is not the self-study of a unified and transparent self but often a meeting with the otherness within the assemblage. Engaging with an artful practice of intimacy as an ethics of care is a way of de-centering the human and paying attention to time. In felting, where agency is markedly distributed, the fibers can be felt as very much alive in our intra-action (Barad, 2007). Human mastery is emphatically not at the center: the felting/writing assemblage has a life and time of its own, out of joint.

Finally, autofeltnography is my way of reframing my professional practice through embodied inquiry for anticipating abundant futures as an 'a/r/temporalist' rather than a futurist. "Artistic interventions can offer different experiences of futurity, attuning bodies to develop techniques to think about the limits of our temporality and to think beyond them to a different future." (Springgay & Truman, 2019). I use "a/r/temporality" as a neologism to depict this 'queering' of time by artistic intervention and as a challenge to chronopolitics.

A/r/temporality does not synchronize with the dominant understandings of progress time and hence performs 'futures' and 'historicity' otherwise.

10:30-12:00
<u>Curated Session: How do our beliefs about work affect the future of work?</u>
J M Applegate, Manfred Laubichler, Sander Van Der Leuw and Xin Wei Sha

Why do individuals work? Should society impose hardships that promote work? How do we determine whether work is socially valuable? Should work be tied to acquiring the resources necessary for living? These questions have had various answers over the course of human history. Given our modern, global capitalistic system, we anticipate that the advent of technological automation, both robotic and computational, as well as the need for a transition to carbon neutrality, will produce a crisis of work demand.

This impending crisis can be described by two aspects. First, given the coupling of our economic production and allocation systems, in which most individuals must participate in the production process in order to earn wages to purchase the goods and services produced, will there be enough work demanded such that all individuals will be able to acquire the requirements for thriving? Second, will the work required be met by existing skills and aptitudes? The recent pandemic has emphasized the urgency of this matter as some individuals were restricted from work, others were required to continue work despite hazards, a fiscal social response was enacted to miti-

gate the consequences of these conditions, and issues regarding work satisfaction and equality were exacerbated.

How should we meet this impending crisis? Anticipation operates out of the dimensionality of our present state, determined by technological capabilities, social-ecological limitations and a landscape of belief and narrative. Not only do we need to anticipate the possible futures resulting from this present state, but we also need to activate our imagination to expand the dimensionality of possible futures. Specifically in the context of work, our current beliefs about work and resource allocation constrain what we think is possible. The emergence of a future is a co-evolutionary process, a future design feedback loop, whereby our beliefs determine the economic technology we choose, and that chosen technology in turn shapes our beliefs.

In order to both meaningfully anticipate as well as design the future of work, we must understand the reality of work in its complexity, as well the underlying social beliefs and narratives that determine the persistence and formation of those structures. In this curated session we will tackle the issue of anticipating and imagining the future of work from several different perspectives.

10:30-12:00
Techniques Workshop: Strategies of Preparedness
Greta Hauer

'Strategies of preparedness' is a research project that examines alternative methods of risk assessment to imagine uncertain futures. It considers historical and contemporary responses to uncertainty while exploring possibilities to act out futures. With a focus on antic-

ipatory actions such as the design of scenario exercises, physical models and embodied simulation experiences the work considers experimental alternatives to calculative practices. The logic of algorithms has shifted the notion of the disaster as an event that is rendered through insurance technology and terminology to consider possible financial losses rather than the threat to individuals. The objective of my work is to reconsider experts and to propose alternative strategies that perceive preparedness through the design of experimental experiences. The work draws on the technologies and logic of military and defence planning, Architectural models and the design of exercise techniques as suggested by non-governmental actors.

This workshop explores methods of preparedness to perceive future catastrophes by acting out responses and risk scenarios through performative simulations. This workshop invites participants to explore a catastrophe scenario in form of active field exercises that are based on the logic of wargames and military training. Anticipatory Actions - also known as measurements of pre-emption, precaution, and preparedness (Anderson, 2012) - are methods that ideally reduce the impact of disasters by performing futures through bodily experiences. Widely used by RAND Corporation, military simulations have been developed in civil defence planning to test out a particular strategy and train responses of individuals to uncertain events. Often performed by small teams of 10 members and played out over several days or weeks these simulation exercises are used to further control possible risks and generate new forms of knowledge. Hermann Kahn, futurist of RAND who extended the possibilities of models and simulations as a foresight method, referred to the mode of capturing future uncertainty as "thinking the unthinkable" (Kahn,1962). In the 70ies Pierre Wack, oil consecutive for Shell, build upon Kahn's methods and further developed simulation techniques into narrative

scenarios that would act as a business strategy. (Matejova; Briggs, 2019). Today risk assessments have shifted towards a practice of designing new risks by deriving from the past while ignoring the possibility to imagine unknown scenarios. Future uncertainties are defined by so-called experts, participating in classical formats such as the round table discussion or developed by algorithms and computer simulations. Can we pre-enact future uncertainties through more just, participatory, and experimental methodologies? Drawing on the design of military field exercises as a possibility to physically act out and rehearse disasters and catastrophic events I will use the setting of Tempe, Arizona to experiment with the possibility to pre-enact a fictional scenario. Further extending the concept of Anticipatory actions the workshops will ask participants to respond to fictional catastrophe scenarios by strategizing and enacting their individual answers of preparedness. The catastrophe will be pre-defined and presented at the beginning of the workshop. Either as a collective or as individuals and with the option to strategize against each other or alternatively to develop collective responses, participants are asked to design methods to prepare, prevent and rehearse through real-life actions. While the workshop will be based on a pre-written script, responses and outcomes are unknown. I understand the workshop as an experimental medium to extend our idea of enacting future uncertainties, but also to generate a debate about forms of risk scenarios while opening up the possibility to trigger the imagination of events that have not yet happened. Not only the conceptual framework of the conference but the geographical and environmental conditions of Tempe, Arizona, and the nearby desert – a space often used for field exercises – offer an ideal base and starting point for these explorations.

10:30-12:00

How does Latin America envision the future? An study on "Latin American Futurism"
Martin Perez Comisso

In the search for new forms of future-making and the rise of regional and local futurisms (like Afrofuturism, African futurism, Gulf, indigenous, and Sino futurism, among others). The absence of Latin America in the future-making is the gap that this project attempts to fill. The region has had institutions dedicated to foresight and strategy for half a century. (Medina, Cabrera and Castaño, 2014). It has a rich space for speculation for creators and policymakers and to engage local communities and knowledge, particularly around environmental and political governance. Nevertheless, those ways of futuring seem to be out of the discussion when discussion about new forms of future-thinking and future literacies may offer in the diversity of possible futures. (Aquino, Muller, Swartz, 2021) As the Mexican scholar, Guillermina Baena has denounced, "Latin America is the gray zone of futures studies." In this paper, I argue that the ways of future-making of Latin America are also multiple and diverse as the region. I describe, based on the analysis of interviews with professional future-makers from the area (such as foresight practitioners, speculative designers, science fiction writers, and strategic policymakers), that Latin American Futurism deals with structural constraints about future capabilities that have been neglected in the anticipatory literature until now. (Sagasti, 2004; Poli, 2015) In addition, those several of those professional works independently of networks or communities of practices that may enable a more prominent recognition in the global scene. Finally, Latin American Futures are grounded on different images of technologies: like social technolo-

gies (Dagnino, 2010; Thomas, Fressoli & Becerra, 2011) that resist traditional understandings of socio-technical systems that have been used in contemporary foresight. This project stands from the Studies of Science and Technology (also known as STS); to connect the intellectual traditions about critical knowledge-making of Future Studies and the local expressions and trajectories of future-making in Latin America. This piece contributes to linking the histories and methods from Latin American Futurism with the global conversations about alternative futures, the need to resist unique futures, as well to acknowledge the multiple forms in which Latin American professionals and their collaborators have approached the incoming temporalities from the peripheral position that Latin America tends to have on the discussions about technological progress and development. In that way, the existence of Latin American Futurism is offered as an umbrella term to explore the past and current practices of the future, describing the most salient elements, and showing some examples from creators and foresight practitioners that are looking what the region can provide to the rest of the world.

Imaginaries of Artificial Intelligence: Industry Stakeholders' Communicative Construction of AI in China, Germany and the US

Yishu Mao, Vanessa Richter and Christian Katzenbach

Artificial intelligence (AI) is considered a key technology in contemporary societies. Political and economic stakeholders in many countries have mobilized considerable resources to its development, particularly in leading economies like China, Germany and the US. At the same time, the technology has been the object of extensive public debates. Although some of these debates have been criticized for using the concept of AI vaguely and inconsistently, for over-hyping its promise, and for oscillating between naive hopes and dystopian

fears, these debates are nevertheless important. They are a crucial part in societies' negotiations of the future they envision for themselves, and the shape and place that the technology should take therein. In this paper, we conduct a cross-national analysis on how industry stakeholders shape the public debates about AI and the implications for its further development in the three countries.

Analyses from Science and Technology Studies (STS), Social Studies of Science (SSS), Social Construction of Technology (SCOT), reflexive technology assessment and other interdisciplinary fields have demonstrated that technologies are socially (co)constructed. They show that technological development and institutionalization are not driven by an inherent, instrumental logic of a given technology, but shaped by political, economic, cultural, legal and other social forces. In consequence, technological fields such as AI feature high levels of contingency and "interpretative flexibility" (Pinch & Bijker, 1984; Meyer & Schulz-Schaeffer, 2006) with different possible trajectories. In retrospect, technology always "might have been otherwise" (Bijker & Law, 1992:. 3). Jasanoff and Kim (2009) have introduced the concept of sociotechnical imaginaries (SI) to define "collectively held, institutionally stabilized, and publicly performed visions of desirable futures [or of fears of either not realizing those futures or causing unintended harm in the pursuit of technological advances], animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology" (Jasanoff & Kim, 2016: 4). Coined to comparatively capture both the high relevance of shared narratives and imaginations for collectives and the role and contingency of technology in building and ordering different societies, SI is a highly productive concept for studying the institutionalization of AI in contemporary societies.

Recent research has identified a strong dominance of industry representatives in media reporting about AI (Brennen et al 2018, Zeng et al 2020), and, at the same time, remarkably different imaginaries in the national Al strategies in these countries reflecting their cultural, political, and economic differences (Bareis and Katzenbach 2021). It still remains unclear, though, in which ways major industry stakeholders effectively interact with national agendas and public imaginaries of AI technologies by pushing their own favorable imaginaries and future visions into the public sphere. We investigate this through a comparative discourse analysis of corporate stakeholder communications, reports, industry analysis, and social media presence from major AI companies in the three countries. In the analysis, we particularly seek to understand the similarities and differences in their visions for AI's future, and how a globalized market negotiates political tensions and cultural differences in the context of such emerging technologies with potential impact beyond national borders. For example, while industry stakeholders have been promoting the narrative of "tech for good" across China, Germany and the US, what are their visions of the good society, how AI can meet public needs, and who are the relevant publics? How do they anticipate the "bad" and prepare to mitigate the risks associated with AI? How do industry stakeholders across the three countries interpret "sustainable AI" and steer their policy efforts to achieve that? What can the similarities and differences in these most powerful stakeholders' imaginaries tell us about the opportunities and pitfalls for the global governance of AI?

Science and technology related future-making through discourse and practices have been studied by scholars using diverse and yet closely related concepts, "socio-technical imaginaries" and "anticipation" being the two. While these two lines of research share the focus

on future representation and their performativity, this paper hopes to better the understanding of tech industry's influence on the making of public goods associated with AI, the cultural variations of this phenomenon, as well as academia's role in intervening and ensuring the future of socially beneficial AI.

The (Narrative) Reshaping of Periphery: Sicily's 1 Euro House Projects as Spaces of Possibility

Dirk Hoyer and Alessandro Nani

Depopulation, demographic imbalances, structural underdevelopment and a decaying sense of community are problems that many peripheric regions in Europe are confronted with. Sicily started to address this problem with the pioneering "1 Euro house" project which is based on a very simple premise: buy a house in one of the Sicilian villages for 1 Euro and become part of the local community. Frontloaded by extensive international media coverage many Sicilian municipalities started to put property on wholesale.

The Sicilian "Casa a 1 Euro" phenomena is an ongoing process that merits analysis on several levels. From an audience study point of view the question of media sense making and effects are enhanced to the maximum level of audience participation: the foreigners who decide to move to Sicily literally change their lives. The newly developing communities in the 1 Euro villages can be analyzed according to new forms of identity creation in a (post-) Covid 19 era with enhanced smart-working options and a growing sense of mobility. What kind of new life narratives and micronarratives in Jerome Bruner's definition and what kind of narrative identities in the Ricoeurian sense are created in these new communities?

Through in-depth interviews with mayors and foreigners residing in Sicily we have examined how media stories can possibly create life stories and what shortcomings and unexpected spill-over effects narratives can have in reshaping realities in the periphery. The Sicilian 1 Euro house projects can thus be studied as cases for applied storytelling with the potential to create new "possible futures" in the understanding of Bertrand de Jouvenel. At the core of our examination is the question: Is the Sicilian 1 Euro house project an example of effective storytelling that has the potential to become a template of narrative reshaping of other peripheric regions?

Through a narratological perspective and the understanding that storytelling is fundamentally intertwined with the political process (see: Sachs 2012, VanDeCarr 2015, Ricci 2016, Fernandes 2017, Seageant 2020) our project is aimed at exploring the interstices between political storytelling and practical community formation as a way of opening up spaces for new public futures. The Sicilian "1 Euro house" projects with all its inconsistencies, frictions and open-ended processes have the potential to create empowered communities and therefore also spaces of possibility.

10:30-12:00
Curated Session: Responsible Futures
Ted Fuller, Fabrice Roubelat, Deon Cloete, Bruce Tonn, Lydia Garrido, René Rohrbeck and April Ward

How might we reveal ways in which practices of responsibility for the future are enacted?
The proposers and panelists for this curated session are currently participating in a project called "Responsible Futures". These are

drawn from a special interest group of around 30 people that has formed to share in a study of responsibility in the processes of foresight and anticipation. The purpose of this is to understand and develop meaning and to shape practices as a result. Practices refer not only to specific futures-oriented thinking (e.g. foresight projects) but to future-creating activities, such as enterprise, activist movements and governance. The concepts of "responsible foresight" (Tonn, 2018, Van der Duin, 2019) and of "responsible futures" (Arnaldi, Eidinow, Siebers, Wangel, 2020) has emerged in futures literature. The focus of the initial programme is motivating contributions that (i) articulate a conceptual basis for the study of responsibility in the processes of foresight and anticipation and/or (ii) identify forward-looking examples of future-making in practice which address global challenges (such as the Sustainable Development Goals) to use as living laboratories in which practices of responsibility can be revealed. Anticipatory systems (AS) have an ethical dimension. In his treatise, Robert Rosen remarks that "The character of a predictive model assumes almost an ethical character even in a purely abstract context. We might even say that the models embodied in an anticipatory system are what comprise its individuality; what distinguish it uniquely from other systems" (Rosen, 2012, p 370). Relationality appears to be an important principle of Rosen's AS and of matters of responsibility. The responsible stance of the futures field addresses many facets of responsibility, Including the issues of values, ethics, morals and of sustainability. The issue is to understand that anticipation is an act of responsibility and has an ethical character. Our discussion in this curated session may surface ethical characteristics inherent in types and forms of Futures Studies and in everyday futures thinking and futures-making. The group has been developing connected conversations since June 2021, and continued these. An edited book and other spin offs are expected. As can been seen from the short outlines of the panellist's interests, the session addresses several of the con-

ference themes, but most specifically in relation to Politics, Justice and Ethics of Anticipation.

Panel contributions

Ted Fuller, University of Lincoln: Facilitator brief introduction: Developing a theoretical and methodological framework for responsible futures; Is it possible to establish Principles for Responsible Futures and deriving from which categories of problematique?

Deon Cloete, The South African Institute of International Affairs: Identity and relatedness in emergence and becoming. How can the reimagining of identity in systems of anticipation inform the notion of responsible futures and the ways that responsibility manifests in futures practice? Building better anticipatory systems alone is not enough for creating responsible futures. Systems of anticipation require trans-contextual relatedness with systems of meaning and identity.

Bruce Tonn, Three cubed, USA. Extent and boundaries of responsibility: How might responsibility for future generations become a cultural and institutional norm? Ethical challenges arise when one can foresee that actions to further one's own short-term interests conflict with the current generation's commitment to satisfy their Perpetual Obligations to future generations. How might these ethical conflicts be addressed through polity and incentives?

Lydia Garrido, Cátedra UNESCO en Anticipación Sociocultural y Resiliencia. Biases, tensions and responsibility in governance: How should responsible anticipatory governance be developed? How does an engagement with, and study of, bioethical challenges in legislative matters intertwine with the Responsible Anticipation approach in the field of decision making in relation to the work on the Futures and Bioethics Commissions in the Uruguayan Parliament?

Prof René Rohrbeck, EDHEC Chair for Foresight, Innovation and Transformation (with Patrick Van der Duin, Netherlands). Freedom, agency and responsibility In business: What elements does 'responsible corporate foresight' entail? What does 'responsible foresight mean in practice? Some highlights are offered on how companies are trying to become societally responsible and, in particular, how they engage in responsible futures by practicing 'responsible corporate foresight'

April K Ward, University of Lincoln UK, France, (with Jessica Bland, University of Cambridge UK). Boundaries and inclusion: How should the futures and foresight field be responsibly considering new, shifting, and emerging boundaries both in the design of processes and desired outcomes? How could these considerations impact knowledge dissemination and creation, as well as decision making?

10:30-12:00

Curated Session: A program to cultivate anticipatory capabilities in West African health leadership teams for primary healthcare transformation

Jumana Qamruddin, Liza Mitgang and Tanja Hichert

The devastation ushered in by COVID-19 reverberates across all levels of development and underscores the reality that when health systems are underprepared for exogenous shocks, our shared economic, social and ecological fabric stands to tear. Such upheaval reflects the current "health" of the world where interdependent outcomes and interconnected risks can lead to cascading, system-wide consequences across human populations, ecosystems and economies.

Accelerating the achievement of better, more equitable health outcomes will require fundamental shifts in thinking and action to

move us to sustainable transformation at a greater scale. However, the tendency to act as fast as possible in the context of almost continuous urgency risks solving for near-term issues that are symptoms of much deeper root cause problems

The pandemic is a call to action for the global health community to rebuild dynamic, people-centered, and equity-enhancing health systems that can effectively and sustainably meet changing population needs. So, how do we practically move from reimagining equitable, people-centered systems to realizing them at greater scale? What new approaches can we employ to mitigate the risk of leaving the most vulnerable populations in a cycle of deprivation and recovery rather than adaptivity and resilience? Who should drive the design of systems that enable people, communities and the planet to thrive today and into the future?

Central to this effort, we must complement technical public health expertise with capabilities to more effectively work in the context of high complexity and constant change. In this context, the related mindsets and skills that underpin futures and systems thinking need to be made more accessible – for want of a better word, democratized – and mainstreamed in the global health community (and beyond) to fundamentally shift how complex problems are approached and addressed at scale today and tomorrow.

The program is designed to help transform primary health care systems by cultivating anticipatory capabilities through an applied futures and systems thinking framework. These primary health care systems, and the contexts in which they operate, serve some of the poorest and most vulnerable populations in the world.

The cutting-edge, multi-month program was intentionally designed to complement senior health system leadership teams' technical expertise. The program emphasizes the integration of skills and mindsets in futures and systems thinking, human-centered design, and anticipatory, collective action. Conceptualized at the height of the pandemic, the program offers a highly interactive virtual learning experience including immersive workshops, asynchronous learning and team coaching to help ensure the shift from learning to integration. Over 50 learners – 6 state health leadership teams across Nigeria – are part of the learning journey. Collectively, these teams are tackling different dimensions of an overarching health systems challenge statement based on their contexts and priorities.

The Program has a set of learning outcomes that highlight the embedded futures thinking approach within an applied systems thinking framework:

Envision the primary health care system in 2035 for your country

Explain current health patterns, systems and models in your country as well as emerging trends and the implications of these for the country's health system

Describe how applied systems thinking and design will move health service delivery to a more person-centric, equitable and adaptive system

Articulate the technical, mindset and leadership skills of 'future of health' leaders and teams

Gain insight into your own reactions to change and identify strategies for managing your response to ambiguity as you lead an adaptive team

The novelty of this program lies in making these skills accessible and relevant to health leadership teams as they work on multidimension-

al health system challenges that they have prioritized. Our pedagogical approach centers the "non-expert" and helps to make concepts around working in complexity and uncertainty more widely accessible by lowering the barrier to entry. This tailored program is designed to enable participating teams to translate learnings and "lightbulb moments" (i.e. mindset shifts) into action through immediate application of skills to their selected challenges. Importantly, this program aims to catalyze a power shift in how--and by whom--primary healthcare systems are reimagined and designed at scale -- from multi-lateral institutions to mechanisms for realizing African imaginaries.

The session will be presented by a multidisciplinary team comprised of public health and human-centered design specialists from the World Bank Group, experts on futures thinking and leadership coaching from the African continent, plus insights from participants in the inaugural cohort. The session will facilitate an interactive, cross-disciplinary dialogue that introduces the innovative approach taken in designing and delivering the program. Together we will have a critical discussion on the program's triple-loop learning model and the lessons we can harness for equitably building anticipatory capabilities in people and institutions.

13:00-14:30
Independent Paper Session: Anticipatory Governance

Towards an Anticipatory Government System
Roberto Poli

While the idea of Anticipatory Governance (AG) has an intricate genealogy and it has been used in widely different contexts, I shall focus only on the transformation of executive power to better address the acceleration and complexity of political and social problems. Systems of governance have been shaped before the discovery of complexity and policy strategies continue to be based on expectations of linearity. As many complexity thinkers have noted linearity distorts our notion of cause and effect. Under the influence of linearity, we tend to expect that each problem will have a unique solution and that proportional changes in the causes will produce proportional changes in the results. Linearity tries to indicate and define the 'what to expect' starting from today's factual analysis and carrying it forward linearly, that is, treating events in a consequential way, as if reality were a Ford assembly line. Input + Input + Input = output. Linearity is a kind of security blanket, supported by an engineering approach to reality, which seeks to appease our anxiety to know the future, providing an illusion of rationality and control. In this context, we believe that it is possible to break down the whole without destroying its coherence or losing information. That is why we divide governments into 'vertical' hierarchies that perfectly align legal mandates, bureaucratic boundaries, and selection and training of staff, all while expecting the end result to be fully integrated actions, that harmoniously fit into a functioning whole. Two consequences are specifically relevant: the first is that the understanding of 'anticipatory' in the expression 'anticipatory governance' should not be confined to the restricted territory of forecasting. According to the terminology introduced by Poli (2019), what comes into play is not only the plan of forecasting based on quantitative data, but also that of foresight, and specifically of strategic foresight. The second aspect to keep in mind is how to build a non-bureaucratic organizational structure. In other words, while it is becoming increasingly clear that decentralization and the dismantling of hierarchies are inescapable

processes if we are to increase the ability of organizations to adapt and respond quickly to surprises, challenges and new developments, the ways in which these objectives can be achieved are not obvious. While the diagnosis is shared, there is no real consensus on the therapies to be adopted. A response to the increasingly obvious dysfunction of the traditional or linear systems of functioning of institutions is that of the anticipatory governance, understood as the framework that serves to develop institutional systems adapted to the complexity of the context in which they operate. A government capable of perceiving changes before they occur is said to be anticipatory, allowing to alleviate risks and take advantage of opportunities that may arise. But how can we move from an essentially reactive bureaucratic organization to an anticipatory one? I shall discuss the main components of an AG system and focus on some of the most demanding issues. Specifically, I will show that an anticipatory government starts from the idea that futures are generated and consumed, that not all situations can be faced with instruments of risk, and that the management of genuinely complex situations requires particular sensitivity, different from the traditional viewpoint of watertight compartments. In fact, anticipatory governance embodies an active and thinking state. This is a government that thinks of and designs the common good, rather than merely managing the state machinery in a mechanistic way; a government that works for a 'desirable' future, without assuming a paternalistic role.

Anticipatory Governance. Delving into the quality of 'anticipatory' as a practical onto-epistemic capacity for 'using the future'.
Lydia Garrido

This paper seeks to contribute to the notion and practical meaning of 'anticipatory governance' by problematizing the concept, scope and

its practical application supported by developments on anticipatory systems and processes (Rosen, 1985), complexity and collective intelligence knowledge creation, with focus on the 'use of the future' in decision-making. Defining the notion of Anticipatory Governance (AG) and its applied scope is a challenge that is at the center of attention. Although contributions have been made from different areas of knowledge in the last five decades, it is in the last three or four years that efforts has been made to generate consensus and effective directives for widespread practice in governments. Integrating the future in decision-making today shows substantive differences to the simplification of the sum of governance (in the various nuances as it may be understood), plus foresight frameworks and tools applied to prevention and planning. Instead, there is a specific focus on the skills and competencies to deal with complexity and uncertainty while integrating the future into the present. Progress has been made from interdisciplinary approaches and relational complexity frameworks to delve into theoretical and practical aspects of the 'use of the future' and anticipation (Miller, 2011, 2018; Tuomi, 2018, Poli, 2019). Supported on this basis, a heuristic conceptual framework (MaCHT in Spanish, Garrido, 2021) for anticipatory capacities is being developed, which is being tested in research (contributing to 'giving meaning' to what is observed), for the creation and strengthening of anticipatory capacities and competencies in decision-making fields and learning spaces.

Exploring "Just Labor Transitions": lessons from Chilean Experience
Nicolas Didier

The context of the fourth industrial revolution is stressing national economies and decision-making processes in diverse ways. For com-

panies, the main challenges are the inclusion of disruptive technologies in the production process and how to adapt their procedures and operation to remain competitive (Valencia et al., 2019). For governments, the challenges are diverse and include understanding and promoting the digital economy to sustain international competitiveness. In contrast, they must sustain the conditions in the workforce to engage in new economic activities and manage employment problems coming from technological disruptions (Didier, 2021). At an individual level, workers must deal with high uncertainty on their educational decisions and how to catch up with the new trends of the labor market. All those challenges signal a pathway by which workers experience a transition from traditional occupations to more technology-related jobs, with its consequences for their family welfare and the whole social security system. The world economic forum has proposed a strategy to cope with the mentioned challenges, calling for a "reskilling revolution" (Cann, 2020; World Economic Forum, 2019). Reskilling revolution aims to decrease the gaps between the current individual and system capabilities and the requirements of the emerging economic activities created by technological adoption. This approach connects the industries and national competitiveness with the future of work and industries' performance. Still, the reskilling revolution is mainly based on private initiative and tends to neglect which kind of roles the government and individuals can play in the fourth industrial revolution. What can the government do to support workers' labor transitions during technological change? That seems to be the key question for public affairs scholars and practitioners. However, analyzing policy pathways and alternatives requires more specificness in analyzing employment-education-productivity than general assertations applicable for industrialized countries. For example, developed countries have experienced an extensive process of deindustrialization guided by offshoring to emergent economies (Autor et al., 2008; Goos et al., 2014). However, in the

case of Latin-American countries, the deindustrialization process came from the failed import substitution policies and the lack of competitiveness in manufacturing industries. Those differences create some conflicts on the imaginaries regarding what implies the "futures of work," the "skills and jobs of the future," and finally, what alternatives the governments must support workers' futures. This paper focuses on a specific condition for policy development: how the educational systems and labor realm will interact and coordinate in the scenarios brought by the technological change. I will use the case of Chilean educational system expansion to discuss and problematize how the labor realm understands and recognize credentials as coordination devices. This analysis will be fueled by the comparison of employability and wage-premium of formal education credentials compared to unformalized credentials from the training system. This paper contributes to the debate on the future of work in three ways. First, the paper problematizes the de-formalization of educational credentials (multiple providers, non-formal education institutions) and how that could inform new labor and educational policies to enhance the coordination of the educational and labor market. The second attempted contribution is to discuss to which extent the trends and policy solutions developed in industrialized nations could be translated to the context of less developed countries. The third contribution is to explore policy alternatives and futures regarding workforce capabilities and how the government can support labor transitions in the context of the fourth industrial revolution.

13:00-14:30

<u>Techniques Workshop: User Feedback: Telling Humorous Stories About Technology and Design</u>

Tim Miller

Arguably, design reviews help designers anticipate the future of design-in-the-making. Design reviews are typically known to take place at important points in the design process in commercial design settings, in which the quality and progress of design is discussed. However, critical design and speculative design (Dunne and Raby 2013) can also be seen as types of anticipatory design review, in which often humorous (Malpass 2013) design proposals are used to provoke debate related to the possibilities of new or emerging technologies. In science and technology studies (STS), design is also often "reviewed" in relation to often-unforeseen effects, thus informing our understanding of the social world (Akrich 1992; van Oost 2003). But how might the humorous qualities of critical-speculative design and the descriptive capacities of STS be united? How might we better engage people in discussing our anticipatory design reviews and reports? This techniques workshop explores how scholarly reviews of design might be humorously enlivened to engage people in anticipatory discussions related to design and technology.

13:00-14:30
Curated Session: Deliberative Visioning and Backcasting as Tools for Inclusive, Just and Sustainable Future Pathways
Aleksi Neuvonen, Atte Ojanen and Nour Attalla

In our session, we will focus on utilisation of deliberation in building a just future, particularly in the context of a transition to carbon-neutral societies. Crucial to successfully designing socially fair and economically viable transition plans is involving future visions of the most vulnerable parts of the society throughout the policymaking process.

In recent years approaches to deliberative democracy - through the use of mini publics, citizen panels, and citizen assemblies - have been applied to formulation of climate policies in several European countries, such as Ireland, France and the UK.

Emerging literature suggests that deliberation is best suited for complex, long-term value issues, such as climate change, that can otherwise be costly for politicians to act on (OECD 2020). Yet, climate deliberation has so far been inadequately future-oriented while also failing to make citizens emotionally engaged with the issue. Furthermore, lack of future-orientedness is especially problematic from the viewpoint of intergenerational justice, as it results in short-termist interpretations of just transition that favour adaptation over mitigation.

The Horizon Europe-funded TANDEM project (Transdisciplinary And Deliberative equity appraisal of transition policies in Energy and Mobility), in which Demos Helsinki is a consortium partner, will be utilised as a case study of these ideas. The project aims at designing an anticipation and deliberation methodology for just transition pathways by involving potentially affected citizens across five countries in Europe. It focuses on transition policies in energy and mobility affecting urban and rural populations.

The project will employ a future-oriented model of deliberation called deliberative visioning that employs art-based methods, allowing citizens to better imagine desirable climate futures and contextualise the transition from the perspective of future generations (Pernaa 2017). Introducing art-based deliberative visioning makes the pathways to fair transition more concrete and 'emotinable' to partici-

pants, and helps with polarisation by crafting a shared, motivational and positive narrative of the future between citizens. Visioning is in its nature an inclusive and participatory process that motivates collective action for long-term goals (Baxter & Fraser, 1994, 4–5).

Deliberative visioning aims to tackle the problems that have plagued some previous participatory experiments: exclusivity, top-down agenda-setting, and insufficient knowledge. It also works on issues of justice, empowering groups that are commonly marginalised to voice their concerns, while still maintaining diversity within the deliberation.

Deliberative visioning does not merely mean a facilitated process of inclusive deliberation over desired futures (Weisbord & Janoff 1995), but also backcasting pathways to achieving this common goal. Backcasting scenario approaches are useful in creating long-term sustainable pathways towards ambitious societal goals, as they involve the creation of a desirable future image including specific parameters, such as greenhouse gas emissions, inequality, etc.
This long-term approach will allow us to firmly place the focus of our collective planning and action on a sustainable future. Not only will this approach aid long-term thinking, but as it promotes the idea that our actions today shape our future tomorrow, it also includes a sense of agency and empowerment in constructing a just future, as it is our actions that are responsible for what the future looks like, and nothing is predetermined.

Anticipating public perceptions in sustainability transitions
Marisa Manheim

Disconnects between decision-makers' and community residents' viewpoints about sustainability transitions can be a critical barrier to implementation. This disconnect is particularly notable in public resistance to municipal plans for direct potable reuse of wastewater (DPR). To build support, some utilities offer DPR water tastings. Applying frameworks from knowledge co-production, embodied cognition and socio-technical transitions, this paper conceptualizes tastings as material co-production, defined as the use of material methods to engage individuals in deliberations that promote social learning across knowledge systems. Material co-production represents an innovation in water governance of potential use in the management of other difficult sustainability transitions.

Logics of Eco-Social Regeneration
Morgan Shaw

The contemporary environmental crises of the Anthropocene involve an array of ongoing processes that are compromising the ability of eco-social systems around the world to support flourishing life in the future. However, amid these processes of harm, many communities are experimenting with ways of cultivating new or renewed life for the humans and nonhumans inhabiting damaged places, basing the actions they take in anticipatory collective understandings of more desirable futures that might be brought about through their work. This paper will refer to these anticipatory constructs as future imaginaries of regeneration.

Future imaginaries are one of three analytical levels of human anticipation proposed by Groves (2017). More grounded in day-to-day experience than abstract anticipatory assumptions, future imaginaries are simultaneously less clearly articulated than representational future images. This makes future imaginaries somewhat challenging

phenomena to research although their content is rich, as they integrate discourses, practices, and materialities to make anticipatory collective action possible.

The literature surrounding future imaginaries is still emerging in many respects, especially in how it deals with future imaginaries of eco-social rather than sociotechnical change. The approach described in this paper explores how to make future imaginaries a more coherent and effective analytical tool, especially for thinking about more-than-human futures in the Anthropocene. It teases out the diversity of future imaginaries of regeneration by eliciting their varied logics, which formalize how anticipatory conceptions of regeneration are translated into programs of action in the present.

A goal of this research is to strengthen the ability of anticipation to inform and contribute to regenerative sustainability, an emerging paradigm that envisions a shift from sustainability understood as preserving what we still have left, to sustainability as rebuilding our capacity to uphold what we value (Reed 2007).

In order to effectively and ethically support efforts to foster regeneration, research on anticipation needs to consider several important issues. It would benefit from both broader and more precise ways of conceiving of how future imaginaries of regeneration operate, who may be able or expected to participate in bringing regeneration about, what kind of contributions different human and non-human partners could make to this shared effort, and what might be at stake for these partners because of their involvement.

This paper explores the diverse logics of future imaginaries of regeneration across a variety of contexts. It does this by examining how these future imaginaries are embodied in projects of eco-social intervention, deliberate human efforts to improve the environmental conditions of specific places through coordinated action.

Logics of future imaginaries of regeneration were identified through diffractive reading of 94 feature-length news articles published in English-language newspapers and magazines from 2000-2021. Each article was chosen because it describes one or more projects aiming to improve some aspect of a degraded eco-social situation.

Diffractive reading is a way of working with qualitative research material that is intended to coax a particular phenomenon into displaying its varied (and even potentially self-contradictory) aspects. The metaphor of diffraction, which is taken from optical physics, refers to an experimental technique for eliciting complex patterns of identity and difference that are more nuanced than oppositional binaries in characterizing a phenomenon. By taking a diffractive approach to reading diverse projects of eco-social intervention through a selected set of pre-existing theoretical concepts, this research aimed to elicit as many meaningful differences as possible in how regeneration "works" in each of them.

The findings suggest that future imaginaries of regeneration exhibit a variety of logics of regeneration as a process. Each future imaginary holds together diverse practices informed by specific anticipatory assumptions about environmental change. Thus, the term regeneration can stand for many different aspirations potentially achievable by very different means, each with its own ethical impli-

cations and dilemmas. Rather than representing specific desirable future states, future imaginaries of regeneration create a shared space for weaving together practices and relations that it is hoped will rebuild context-specific but as-yet-undetermined possibilities for flourishing life in the future.

13:00-14:30

Techniques Workshop: Flights in Futures: Building Stories of Tomorrow

Lisa Kay Solomon and Jeffrey Rogers

During the spring quarter of 2022, we piloted a new course at the Stanford d.school intended to help students explore the intersection of futures-thinking, narrative, and leadership and to develop their agency and critical capacity as both creators and consumers of "stories of tomorrow." Designing an introductory, open-enrollment futures course that would engage students from a wide range of academic disciplines and backgrounds at the university level presented a fascinating but fruitful challenge. Through this workshop, we hope to refine learning designs from the course and socialize some of the interactions with more futures practitioners, researchers, and educators.

Our working hypothesis has been that deconstructing and reconstructing "images of the future" provides an easily accessible but rich point of entry to the study of anticipation. We believe that the futural imagination is essentially combinatorial in nature and that the critical, creative, and constructive capacities of the futural imagination can be developed through intentional exposure to – and reflection upon – more images of the future that are varied, nuanced,

illuminating, expansive. The course was designed to introduce learners to an expansive set of techniques for deconstructing and generating images of the future and to provide them with a space within which to learn from futures. In essence, we designed experiences for learners to reflect on, experiment with, and build out their innate prospection capabilities.

The Flights in Futures workshop will showcase some of the interactions developed for the course – one to facilitate deconstruction of images of the future and another to facilitate construction of new narrative prototypes through the recombination and recontextualization of existing images of the future – and provide the instructors with the opportunity to gain feedback from a broader community of practitioners before making the the materials available to other educators.

As in the Stanford class, we will take Anticipation workshop participants on a "futures flight" to explore possible future worlds through a set of accessible, collaborative methods. These interactions employ a novel card deck containing a range of images of the future (drawn from popular culture, history, current events, advertising, etc.) and a collection of combinatorial worldbuilding prompts to be used in the deconstruction of these images and then recombinant construction of the same images into new narratives/memes. After a round of debrief and feedback, we'll share the final capstone projects from the class (which were organized into a "Worlds' Fair of Futures") to expand the reflection, discussion, and critique. We'll close with a consideration of the larger project of teaching anticipatory practices in an educational environment.

Participants will leave the workshop familiar with a new set of inter-actions (to published online January 2023) that can be used in explor-ing anticipation and futures with a broad/diverse group of learners.

13:00-14:30
Curated Session: Flyover Fictions: Extreme Life
Ash Eliza Smith, Stephanie Sherman, Yasaman Sheri and Joshua Herr

Flyover Fictions: Extreme Life is a curated session exploring art-sci-ence collaborative research in rural justice. This panel rethinks the role of the rural in anticipation, alongside challenging how specula-tive design and storytelling can play a role in the scientific research and engineering that is shaping rural infrastructure.

Future design often fails to include the rural populations that live and work there. The rural can be characterized as a place with a low density of human populations, but populations of other species and materials are often robust. Systems like solar, wind, and food are of-ten situated in rural areas, as are the material hubs of the ever-in-creasing cloud and data infrastructures that fuel and feed the urban. In Flyover country, new infrastructures and technologies yield strange designs and human-nonhuman relations. The plains of Ne-braska, long known for farming fields, are now research sites for en-ergy systems, livestock farming, plant cultivation, ecosystem health, and environmental resiliency.

Flyover is a platform for rethinking rural systems design and envi-ronmental futures— from the Nebraska plains to the deserts of Ari-zona to outer space. It is based within the Story, Worlds, Speculative Design Lab at the Carson Center for Emerging Media Arts at the

University of Nebraska Lincoln. Flyover Fictions brings together Nebraska scientists with global design practitioners. The results are stories, creative tools, and conjectural anecdotes that anticipate other realities beyond the day-to-day work of scientific realism.

Our proposal for Anticipation 2022 focuses on strategies of artist-designer-scientist collaborations, focusing on one case study of Extreme Life/Extremophiles as an opportunity for rural research and rural justice at the fringes of life as we know it. How can we build literacies and methodologies across disciplines to communicate possibilities and preferable anticipations? Indeed, innovation is a vital aspect of this matrix, but so is the ability to communicate and tell stories across emerging media platforms such as VR/AR, immersive experience design, and games.

This session explores the role that speculation, speculative design, and storytelling can play in opening up existing scientific worlds to a spectrum of secondary effects, possibilities, inquiries, and spatial dynamics. In sum, design and art can bring an anticipatory dimension to science that pushes the discipline to extreme places and positions, testing its edges and borders and anticipating future scenarios. Bringing art and design to scientific processes also builds upon the often missed opportunity for the creative worlds of speculative design and the actual science where a thousand hyper-real and surreal ideas are buried. The job of scientists is explicitly to explore the existing, empirical world, but through this process, scientists encounter clues of a bigger picture – trajectories, impulses, possibilities. Scientific breakthroughs and our understanding of the world will also require new communications and stories.

This session invites one pairing from Flyover Fictions: computational biologist Joshua Herr with designer-artist Yasaman Sheri. Their project called Desert Skin & Microbial Glyphs is created through building a collaborative archive of extremophile microbes and organisms; while the investigation includes various types of research, the outcome takes the form of typographic glyphs with the ability for anyone to download and use in any written document digital or physical. Through the creation of these icons and by making them available for anyone to use programmatically on various online interfaces, new criteria of the microbial world are observed and anticipated, providing the online public with vocabulary and language that lead to education and communication surrounding the world of microscopic.

The project questions the human relationship with language around life forms and how humans gaze at 'nature.' The glyphs are a biosemiotic language for invisible organisms and ask us to consider the history of use in living things as decorative objects.

The term 'extremophile' is questioned as it is seen as a human-centered view of life forms. An extremophile is any organism that is adapted to survive in extreme environments not hospitable to humans. Extremophile microorganisms have been inspiring, intriguing, and appealing for use as technological and scientific imagining around data preservation, life outside earth, and sensing. Microbial Glyphs uses extremophiles as a first typeface within the family of Microbial fonts to draw attention to the discourse around our relationship to life forms and invites dialogue by embedding the downloadable typographic symbols directly into our digitally mediated interfaces and language.

13:00-14:30
Independent Paper Session: Applying Anticipation

Healthcare Quality measurement and Politics of Anticipation
Pooja Chitre, Kathleen Pine and Melissa Mazmanian

Factors like erosion of public trust in healthcare professionals and organizations, increasing policy focus on value-based reimbursement have forced hospitals to establish new practices of accountability and visibly embrace new forms of performance measurement. In service of measuring, verifying, narrating, and "performing" performance, the healthcare industry in the United States has developed a massive enterprise premised on the capacities of information technologies to measure and determine quality of health care practice. Automated performance measurement algorithms and expanded capabilities for data storage, retrieval, and analytics have become critical tools in demonstrating attention to cost, performance, and effectiveness. This has also resulted in explosion in the number of quality measurements that healthcare organizations collect for internal use and report externally. This paper argues that the quantitative assessment scores and organizational performance are made commensurable through metrics and performance ranking systems, and further, that the managing healthcare practice via these quantified systems restructures the way that healthcare organizations and individuals therein reflect and learn. Further, the shift to quality measurement is shifting the temporal orientation of healthcare organizing as organizations increasingly focus on anticipation of future quality measures so as not to be left "behind" their peers.

We use a practice theoretic lens to identify how healthcare quality measurement affects organizational practice at the micro level. In order to do so, this paper takes inspiration from critical accounting practice—specifically, literature that, drawing on Foucault's work on power-knowledge systems, to describe how numeric performance measurements discipline organizations and workers, and influence how organizations anticipate the future and change their behavior (Hoskin & Macve, 1986; Espeland & Stevens, 2008; Espeland & Sauder, 2016). We also draw on sociological literature on valuation to describe how quality is made commensurable, and auditable, through particular numeric practices that reduce a phenomenon (the "goodness" of healthcare work) into a small set of scores –e.g., numbers or letters that indicate an organization's performance (Lamont, 2012). Drawing on critical accounting literature that examines the reformulation of examinations in other domains (e.g., education), we analyze how numeric and graded symbols of quality are constructed and explore the impact of these symbols on the governance and management of health care work. Specifically, we use multi-sited ethnography of quality measurement of obstetrical services across multiple organizations in the U.S. to answer the following research questions: How is "quality" enacted in organizations through quantitative performance measurements? How do numeric performance measurements discipline organizations and workers, and influence how organizations plan for and change their behavior? And, given that "quality" is a moving target, what is the role of anticipation of future demands for quality audit in organizations' enactment of quality measurement?

Data collection spanned three years of observation and interviews with field sites carrying out multiple facets of quality measurement for maternity (mother/baby) services. This included three hospitals

in a larger hospital system on the west coast and a statewide quality improvement (QI) organization housing a data center (which serves the entire west coast) for maternal care quality. Data collection also took place with participants who are key developers or users of maternity care quality measurements, such as professional standard-bearing organizations and consumer activists.

Drawing on this large corpus of data, we present and critically analyze multiple cases of quality measurement. These include the rate of central-line associated bloodstream infections (infections that occur because of a hospital procedure), the number of cesarean sections performed on women with no risk factors, and the percentage of infants born due to physician choice prior to 39 weeks of completed gestation. Through our analysis of these cases, we propose that 'quality' is a, if not the, key metric for healthcare services, and its determination rests on a number of commensuration processes where quality is made commensurate with performance and thus accountability. The quantitative measurement and rankings practices become objects of anticipation and reframe the temporal orientation of the self in terms of the many i.e. organizations find it necessary to enter into a mode of anticipation and "keeping up" with standards. Standards may change the underlying assuming that the construct can be measured quantitatively cannot i.e this understanding of quality is taken for granted as an obdurate reality. The accounting practice of applying quality metrics similarly restructures healthcare organizations as a population of 'calculable hospitals' and (increasingly) 'calculable physicians/nurse practitioners'. The entire system of being built and managed for measurement.
The paper proposes that shifting material form these commensuration practices creates a state of "anticipatory ambiguity" as the field sites constantly look towards the future to predict upcoming quality

metrics in order to not fall behind. This has several implications for healthcare organizations, clinicians, and other stakeholders including shifts in allocation of organizational resources and changing professional expertise in the organization. For instance, physicians have long enjoyed a wide degree of autonomy in the U.S. This scope of autonomy rapidly narrowing as physicians are increasingly accountable for adhering to specified work processes rather than producing acceptable outcomes. We argue that this state of anticipatory ambiguity is shifting focus from certain enactments of quality care towards managing and preparing for surveillance—potentially undermining the reason the indicators were there in the first place. This raises important questions about the consequences of quantitative regimes of performance management for healthcare and beyond, as a wide variety of sectors seek to use data-driven performance measurements to audit and manage care and see such regimes as fundamental to the future of work.

FIT for the future? Assessing the anticipatory capabilities of organizations
René Rohrbeck, Ignat Kulkov and Patrick van der Duin

For-profit organizations are still predominantly organized to execute known business models. Operating lean and effective in markets with a high level of competition then becomes an advantage, thereby further increasing the focus on itself and on the present. This may lead to rationally bounded leaders running organizations that have become too inert to survive major changes in their environment. In recent years, a succession of disruptions (e.g, new technologies, changing geo-political relations, Covid-19) has exposed the vulnerability of firms failing to anticipate and failing to plan and in consequence have developed no alternative response strategies. In stable

environments firms without anticipatory capacities might remain successful for a long time but they are little prepared for uncertainty and volatility. In times of uncertainty, firms need forward-looking skill, methods and tools that many lack. Those companies with sufficient skills and tools might find that they are too patchy to be effective or lack the connection to decision making to ensure an effective organizational response. There is, however, an increasing number of documented cases, where firms innovate their business models, introduce new strategies, and pivot in the light of disruptive change. For instance, Merrill Lynch created a new dominant business model for the financial service industry showing that anticipation and strategic foresight has added value. However, the anticipatory abilities of strategic leaders at the helm of an organization, seem not to be enough to ensure satisfactory strategic outcomes when faced with uncertainty. Organizational characteristics as well as planning and decision-making routines may play a vital role. This paper introduces the Future FITness model which investigates and measures the extent to which organizations are prepared for the future. It conceptualizes organizational anticipation capabilities, also known as strategic foresight or corporate foresight capabilities. Longitudinal evidence suggests that such anticipatory capabilities can be a predictor of superior firm performance in the future. The Future FITness model measures the need for anticipatory capabilities based on the organization's strategic posture, market rivalry, market dynamism, and the market uncertainty. The Future FITness model compares the need and the maturity of the organization's anticipatory capabilities and assigns a Future FITness level. In the session we will also present our planned global study on Future FITness which will kick-off in 2023.

Envisioning Ethics – How to foster ethical reflections on futures to design responsible technologies.
Nele Firscher and Wenzel Mehnert

The anticipations of future events guide current actions and decisions. This becomes important when studying the development of new and emerging technologies, such as applications in the fields of robotics or machine and deep learning. The anticipations of how those technologies might change the world for the better form the vision of the development team and guide the development of the respective technology. In other words, the anticipative visions contain a - mostly implicit - ethical script for a future world, which is created within a specific value framework. Anticipation, thus, is not a neutral act but instead highly normative in the sense that it implicitly holds what it means to build a "better" world. It raises ethical questions like: Better for whom? Better under which premises? Better in which sense?

This creates a challenge, as emerging technologies come with the promise of having a high disruptive potential and their implications for societies and the planet are often unclear. As current developments show, negative and often unintended consequences include discrimination of already underpriveleged groups and raising inequalities. One cause, this paper proposes, is that the visions and the (implicit) ethical guidelines, which guide developers during the development process, are seldomly critically reflected nor are the developers biases challenged from outside perspectives during the development process of emerging technologies. One reason for that is the current paradigm of technology development, which is driven rather by feasibility and the curiosity to develop than by socio-ecological desirability. Thus, the reflection of a wider socio-ecological

perspective or the explicit discussion of the inherent ethical values of the guiding vision often come to short; if done at all.

The question this paper addresses is how visions can be explicitly reframed to enable responsible technology development. In a combination of theory and practice, we examine approaches to a) make the guiding anticipations within a development team, such as implicit visions of imagined use cases, explicit and tangible for a joint reflection, and b) to include such a critical reflection on premises, worldviews and ethical implications iteratively at important milestones within the development process. This also entails c) going beyond the anticipations of the development team only and to create further interactions with potential (non-)users by including multiple stakeholder perspectives into the discussion.

The paper will, on a theoretical level, examine the interplay of anticipations, especially visions, their guiding power in the context of technology development, critical reflections and (participatory) opportunities for creating responsible visions. To do so, we draw especially on the work done in the field of Critical Futures Studies and participatory as well as integrated Technology Assessment, as well as on work in the realm of Responsible Research and Innovation and Value Sensitive Design. On a practical level, the paper elaborates on methodological approaches that enable such reflections and reframings. Here, we focus especially on speculative and creative methods that support imagining desirable futures, drawing on participatory future studies, Experiential Futures and practices of writing speculative fiction, such as worldbuilding or storytelling. Furthermore, we present a case study from our own work, done in the Berlin Ethics Lab at the Technical University in Berlin, on developing and re-

searching these methods for ethical reflection within actual technology development processes.

We approach the paper from the angle of Futures Studies, and our methodological focus offers fruitful combinations of Critical Futures Studies and Experiential Futures with the aim of ethical reflection and using the anticipatory power for guiding actions and decisions for creating technologies for desirable futures. With that focus, our paper is positioned at the interface of three conference themes: It connects to questions on the ethics of anticipation (theme 2), and especially on the question of how to make the worldviews, principles and practices that shape anticipations explicit in order to develop ethical anticipations in the context of technology development. As the paper explores ways of integrating the critical reflection of guiding anticipations into the technology development process, we also connect to theme 4, critical anticipatory capacities. Our paper supports this discussion by highlighting both: methodological options for a critical reflection of visions and examples of integrating critical reflection into a technological development process. Furthermore, to engage with critical reflections, we propose to integrate multiple perspectives, connecting to theme 1, public futures. We discuss opportunities to create spaces for shared anticipation beyond the development team, empowering diverse stakeholders to challenge the guiding assumptions and to co-create technologies with regard to desirable futures.

By giving an insight into our work at the Berlin Ethics Lab, into the methods we developed and into a case study we conducted, we want to contribute to the discussions on how to open up the space for ethical reflection of anticipations with the aim to responsibly design emerging technologies.

15:00-16:30

Anticipation for future generations: Foresight and future generations in law-making
Amos Taylor, Mikkel Stein Knudsen, Toni Ahlqvist and Juha Kaskinen

More and more initiatives, from top-down UN processes to bottom-up activism, seek to emphasize the rights of future generations within today's political and judicial systems. The topic of rights of future generations is key subject of emerging literature on intergenerational fairness and increasingly addressed within political and moral philosophy. Thus, it is also an apt topic for the interdisciplinary field of Anticipation Studies.

This paper derives from the Finnish government-funded FORGE-project (described below) for which the central research question is: How can legislative processes in Finland be improved to better represent the rights of future generations? The project thus strikes right at the core of the emerging discussion, albeit with the national context of Finland as focal point. The paper here addresses the future-oriented components of the project in general and theoretical terms, as it seeks to square the perspective of future generations with traditional foresight and Anticipation Studies approaches. Building on the unique research data collected for FORGE, the paper discusses key tensions and complexities identified within this intersection of emerging rights-based approaches to the future and other traditional anticipation approaches underlining uncertainty and emergence.

In particular, the paper discusses the tensions between the concepts of "future generations" and "long-term". This distinction, with important implications for preferences in real-world policymaking, has not been widely discussed within the academic anticipation literature previously. The paper further discusses the two concepts' connections to value-based (political) and expert-based (technocratic) governance styles in the context of a Nordic welfare state (Finland) and its democratic governance system. This leads to a fourfold configuration of anticipation styles, which we theorise from the perspectives of anticipatory governance and anticipation theory, and especially anticipation theory's key dialectic between continuous emergence and more stable long-term structures here termed as "relative permanences". The theoretical discussion provides a valuable and timely contribution, as the above dialectic is perceived as inherent anticipatory logic, when seeking to speak for future generations in an uncertain and volatile world. The configuration and the theoretical discussion are concretised with relevant data gathered during the FORGE project.

The FORGE research data underpinning this paper includes a triangulation of various data sources: i. A systematic review of relevant peer-reviewed academic literature, ii. A review of key grey literature such as reports by international organisations, iii. Interviews with key Finnish stakeholders, and iv. A survey of 150+ international foresight experts fielded February-March 2022. The unique survey of international foresight and anticipation experts provide the main data source for this paper, although other collected research data is also applied.

Process Tracing the Future: Decision-maker conceptualizations of urban just transition pathways to sustainable and resilient positive

futures
Liliana Caughman

Our urban environments must urgently transition from extractive, vulnerable, and unjust to sustainable, resilient, and equitable. The task is complex and requires systemic transformations across social, environmental, and technical infrastructures. But the question remains: How do just transitions to positive urban futures occur? Decision-makers are responsible for defining and implementing the policies, plans, and projects that lead to transformations towards sustainable and resilient futures. However, we know little about their conceptualizations of just transition pathways. This research aims to uncover the mechanisms that facilitate sustainability and resilience just transitions, as conceptualized by collaborative groups of urban policymakers, community members, and researchers. To discover how decision-makers think just transitions happen, this research uses a modified process tracing methodology to uncover proposed causal relationships between actions and outcomes on pathways to positive futures.

This project analyzes data from a scenarios workshop held in Phoenix, Arizona, as part of the Urban Resilience to Extremes Sustainability Research Network (UREx SRN). Workshop participants created projected timelines dictating the pathways to proposed futures that were resilient, sustainable, and equitable. A comprehensive process tracing analysis of timelines allows for comparison of proposed transition pathways, indicating how decision-makers characterize key causal mechanisms and illuminating their theories of change. The transition pathways are evaluated to understand whether they are just and equitable, innovative or conventional, logical or assumptive. Finally, the work concludes with a reflection on

the usefulness of process tracing as a tool for visioning and planning just transitions.

Eigenforms of time - a conceptual design exercise
Piotr Michura

Memory and anticipation should not be approached as separate faculties but as components intertwined within the cognitive process establishing coherence for individual perceptions in the present.

The paper discusses three alternative models of time. Two models are based on Hans U. Gumbrecht's chronotopes (socially constructed temporalities): (1) the "historicist chronotope" and (2) the "broad present chronotope". The third (3) is based on second-order cybernetics and systems thinking - mostly referring to Heinz von Foerster and Niklas Luhmann's work.
How does each of them affect designing?

1. The historicist chronotope is rooted in interpreting and self-reflexive subject, bodiless and detached from the object of observation. A subject is located in the present, which is a short moment of switch between past and future and is endowed with an agency to choose from future opportunities. Past events gradually diminish. A historicist narration represents the past while embracing different perspectives – multi-perspectivism is neutralized and an observer position is hidden. The historicist narration provides confidence in the necessity of events (contingency is neutralized). Time is considered an independent agent of change – everything changes in time.

2. The broad present chronotope implies an embodied subject, whose way of operation rests on the direct sensual experience of reality. While in the historicist chronotope time is the dimension where negotiation of subject/object relationships takes place, for the broad present chronotope the main locale is space. It recognizes materiality and a body as a basis of cognition. Representations are replaced by direct encounters with the world "here and now". It gives rise to the notion of "production of presence." This concept questions the attitude that tends to see every cultural phenomenon only as a carrier of meaning. Instead, the "experience of presence" is an intense feeling of the immediacy of sensual contact with the objects. The production of presence is a non-representational and non-meaning-producing event.

3. The chronotope implied in systems theory and constructivist worldview has been based on radical temporality. It consists of discrete presents, moment to moment events of no duration. However, the present offers views towards the future and past – a memory of the past and anticipation of the future – both guided by meaning constructed in/for the present as a difference between past and future. An observer looks for patterns within recurrent processes of activity and feedback. Identification of the patterns is needed to build a coherent view of assumed reality in present. Von Foerster proposed the concept of objects as tokens of eigenbehaviors – invariances in observation and sensing of the environment by an observer over a prolonged timespan – leading to eigenforms. The notion of time is a social system's construction, which allows a self-description and differentiation from the environment - an oscillation between self-reference and hetero reference allows temporality to emerge.

Designing and Socially Constructed Temporalities

As the historicist chronotope supports the inevitable necessity of changes, it is an ideal context for design understood as a problem-solving activity. Designing involves explicit predictions about preferred future states based on some regularities identified in the past. The design process is, according to this view, a goal-oriented activity aiming at "completeness and perfection" (Landgraf).

Designing in the context of broad present chronotope would be oriented towards simultaneous conception and presentation similar to improvised performance. If it contributes to the production of presence, its meaning-making and representational capabilities would not be the main and only ways it relates to the world. Starting from the contingent beginning a design can follow its emerging program, which further will govern its construction and completion. This is a conditional process as opposed to a goal-oriented one. Contingency is opposed to completeness. The design constructs its reality, concepts, also signs.

The system theoretical perspective allows defining design as a functional system of society (cf. Luhmann), in which re-production is based on communications and meaning. Design, like other systems, is an operationally closed system, i.e. it reacts internally to "irritations" coming from outside – but no operations enter or exit the system. Internal operations are triggered but not determined by outside events. The system observes (cognizes) its environment according to its own terms (which filter what is relevant to its functioning) following a self-induced program. It is blind to other aspects. So, in the context of designing, the question: "Which pasts for which future presents are of importance for the observer?" (Luhmann) refers to the inherent relativity of design communication processes (decisions) based on the internal notion of time. Also, the very notion of com-

munication involves retrospection – further communications define the meaning of preceding ones. An (im)possibility to synchronize the individual systems' timeframes becomes the crucial factor.

Design Melancholy- or Implausibility of Designing
Similar to all functional systems of society, the design system creates opportunities for richer connectivity and increasing complexity of society. But the second-order observer (observing the system/environment distinction of the first order) can see aspects of designing leading to potentially unexpected consequences and disillusionment.

Systems theory paradoxically shows that no designed scenarios of a future can be fulfilled – actual future states cannot be predicted as the very act of modeling changes the future conditions. As Elena Esposito contends that the models are right but anticipate the future states as if there were no models which have been pursued. The increasing complexity of society, in which design takes part, does not necessarily lead to better adaptation to the environment. The disintegration of a notion of a person as a conglomerate of operationally closed systems allows speculating on design prospects when "a user" is not a central focus of designing. A person is constructed as a set of expectations observed by the social system to simplify the complexity of its environment. The notion of an object is questioned – the distinctions become a central focus instead (eigenforms). The myth of control is undermined as it is impossible to control and directly influence trajectories of operationally closed systems. Finally, the paradox of decision making – "Only those questions which are in principle undecidable, we can decide" (van Foerster) – may lead to the conclusion that design decision process is either a simple accounting or leads to infinite deferral. In both cases, the designing system does not live up to its promises.

15:00-16:30
<u>**New Ideas Session I**</u>

New Design Mythologies Manifesto

Ben Schoenekase and Ruchita Arvind Mandhre

Cross (2006), claims that design should be considered as a third culture of education. As a culture, design has a history, knowledge, and process that make its own mythology. However, documented mythologies of design culture mostly come from resources of the West. We propose to combine our knowledge of design mythologies of the East and West to address the biases that plague design logic as a form of perpetual dualism through: Aesthetic Craft vs. Functional Success. We exist in a world of perpetual change, where designers try to address unpredictable challenges of the future based on a limited, biased understanding of the past. This inherently is one of the biggest challenges for designers of the future. To break away from this loop we are calling for a novel, design-thinking manifesto that addresses adaptability, not as a modernist critique of solutions, but as a recontextualizing of mythologies for future designers. The current ideas of change draw from memory and nostalgic ideas of the future that make the concept of change inaccessible. In reality, the unpredictability of change is what shatters this utopic comfort.

We propose play, as a form of design thinking, where craft is a mode of inclusivity without the hesitations of graded evaluation. Light's (2021) work on collaborative speculation uses the concept of play as a combination of speculation and materiality to develop interactive prompts for designers and stakeholders to co-create the future. Light (2021) highlights the positives of using play as a method to make the

co-design process more democratic by stepping away from the designer-centric approach of speculative design to sharing agency with all stakeholders. Asenbaum & Hanusch (2021), take the concept of democracy further by suggesting the use of design spaces for democratic innovation. They propose a shift of focus from solutions to unexpected outcomes that may be the result of play as a design method. Asenbaum & Hanusch (2021) criticize a participatory design process through which the New Mythologies Manifesto will expound upon within the profession and academy.

Change is design. Thus, there is a need to evaluate ethics and realities on a new standard of excellence that does not deny change, but embraces deference. Again through play, designers are freed from the burden of mythological constraints that bound the present to the past without allowing the future to develop. The potential of play's flexibility is a powerful tool in decolonizing anticipation. Through new media innovations, designers are able to leverage varied ideas of change that recontextualize cities, artworks, and histories (Foucault, 1976)

Today, the designer is burdened with the canonical mythologies of their geographical heritage without an ability to embrace uncomfortable scenarios. Mercer & McDonagh (2021), suggest the use of transformational experiential learning as a pedagogy of discomfort for design education. They use a social experience as a common context to help students with different backgrounds engage in difficult conversations that force them to address their inherent biases, and challenge the notion of a 'correct' solution. This could be a way of making the design process more inclusive, however, more research on this is required.

Our manifesto speculates on futures with an ever present notion of change. Using design fiction as a tool, we compile a manifesto through oral histories, unmitigated images, and revised practices for design. Abloh (2019) and Fuller (2008) speak toward the importance of discursive thought as a means to supplement additional learning practices. From art, aesthetics, robotics, history, fashion, etc. both authors highlight the importance of learning practices of the "land" and the "sea" (Fuller, 2008).

With the arrival of the manifesto, we are looking for critiques of the applicability to design thinking, design education, and the biases of design authorship (Foucault, 1969). The impossibility of "correct" speculation is at the heart of our discourse that attempts to break from the tropes of actual vs. fictional. Design is a platform for sociological change that cannot be clipped of its potential to inspire, imagine, and innovate.

Through the use of the manifesto, we are attempting to dismantle the paradigms around design education. Concrete ideals inherent in design histories that forge future practices. Design Education must embrace an amalgamation of the known and unknown without discernment for what is the "truth." The designer, as with the student, must challenge their foundational assumptions around what is aesthetically perceptible and what can be unlearned empirically. Play, as with Science Fiction (Pinto et. al, 2021), unlocks the capacity of infinite alternatives without begrudgingly addressing the world within which it is generated. This begins a pursuit of restructuring the agency of the "studio," "practice," and the "discipline" into a form of new mythology.

Redesigning Corporate Culture – Remote work as a long-term transition of workplaces towards more sustainable corporate culture
Talvikki Kollmann

The way we work is consistently moving towards digital spheres, enabling ever-more flexible working arrangements. The quick adaptation to remote work practices during the COVID-19 pandemic has shown that remote work might be here to stay, shedding light on the necessary changes that need to take place for future work environments to be just and inclusive and for these to sustain irreplaceable environmental resources.

This PhD research focuses on the long-term sustainability implications of remote work to understand the changing role of the workplace and to steer inclusive and sustainable corporate culture. The aim is to explore current remote work practices, to understand the changing role of the workplace and to develop engaging methods that assist stakeholders in envisioning and creating shared images of the future of work. By challenging existing corporate norms and ways of working, this project significantly contributes to the conceptual premises of sustainability within contemporary corporate culture. Moreover, situating this research in the field of design, this research contributes to areas of design research that are concerned with sustainability transitions, both theoretically and methodologically. And lastly, this research brings forward the discussion around the increasingly crucial role of designers as mediators and enablers of transitions processes.

The Science Fiction Feedback Loop and the Evolution of the Metaverse Imaginary

Rizwan Virk

This paper will present on-going research to understand the role of science fiction in influencing the social construction of real world technoscience, not just as a one-off but as an on-going process of co-production. The primary example/case study that this paper will propose studying this multi-looped process is through the Metaverse, an all-encompassing term for a versions of an interconnected virtual worlds that contain digital venues, and digital objects and are explored via avatars, or 3d representations.

While there has been literature on technosocial imaginaries and vanguards, and the significance of science fiction's influence on inventors and on specific technologies, much of the existing literature has stuck to examples of one-way influences. Several concepts that are particularly relevant are the Science Fiction Feedback Loop and the role of the adjacent possible, as well as its intersection with Applied Science Fiction, a set of techniques for forecasting and using science fiction as a form of scenario planning and a type of anticipation. This paper will show that these concepts, along with STS concepts such as the stabilization of an artifact, the social construction of technology, even the evolving role of identity across multiple domains as cyborgs, when applied to the metaverse, resulted in successive waves of inspiration and development, as shown in Metaverse 1.0 (historical attempts to build the metaverse) and Metaverse 2.0 (the development of which is currently happening) .

This paper argues that techno-futuristic visions are realized incrementally, and then these real world innovations then influence future science fiction writers, who then influence the next wave of technoscience development as the adjacent possible is expanded through the development of technosocial infrastructure (science and technological developments upon which new innovation and applications are based). This relates to the concept of modifiabile futures For the metaverse in particular, we can see how the initial set of imaginaries (such as Snow Crash and cyberpunk classics) led, as the adjacent possible expanded to include broadband and graphic cards, to the wave of Metaverse 1.0. Then, as both video games, MMORPGs and VR/AR technologies developed; these were incorporated into a second wave of science fiction (such as Ready Player One and a whole subgenre of gamelit), which in turn inspired entrepreneurs and innovators to build Metaverse 2.0 (which is what we are currently hearing about in the press today).

This paper will argue that we are seeing this kind of social construction in process with the Metaverse. This type of social construction involves both visionaries and imaginaries and the various elements of market adoption and basic research that makes the next wave of development possible. These waves show how while an artifact may stabilize and lose interpretive flexibility, further advancement of the adjacent possible, and incorporation of the technology into new visions of the future in the form of new science fiction, sparks future waves of interpretive flexibility and stabilization, again using the metaverse as an example.

15:00-16:30
Curated Session: Feminist anticipation across layers of smartness: Social implications and risks

Toby Shulruff, Elma Hajric and Farah Najar Arevalo

This curated session invites participants to explore how imaginaries of digital technologies embedded within personal, domestic, productive, and public spheres implicitly pose particular social values as trade-offs (e.g. security vs. privacy, efficiency vs. care). By utilizing a critical feminist approach with reference to the work of, e.g. Harding (2004), de la Bellacasa (2017), Wajcman (1991), and Haraway (2019, 1988), this session aims to sketch possible futures for the anticipation of 'smart' technologies, as specifically feminist imaginaries. The session is led by School for the Future of Innovation in Society students Toby Shulruff, Elma Hajric, Ben Gansky, and Farah Najar Arevelo, each of whom are interested in exploring how the ethics of emerging 'smart' technologies across scales and contexts are shaped by the ways that social values and implicit constructions of gender relate.

In line with the conference theme "Politics, Justice and Ethics of Anticipation" and the question "Which worldviews, principles or practices are involved in ethical– and unethical– anticipations?" this session will engage with a feminist approach to how the discourse and practice of sociotechnical ethics across scales and contexts are shaped by gendered imaginaries. Examples of technologies we hope to discuss include implants and wearables that monitor sensitive information in and on the body, technologies in the home used for domestic violence surveillance and control, employee surveillance through emotional recognition technologies and voyeuristic use of cameras, and location tracking and transportation infrastructures in city contexts. How do framings of anticipated ethical considerations (fail to) consider both the gendered experiences of potential stakeholders and the situated perspectives of the anticipators?

Visions of 'smartness' across contexts and scales often fail to consider gendered vectors of harm (Daniels, 2009; Leitão, 2019; Levy & Schneier, 2020; Parkin, et al., 2019; Slupska, 2019; Slupska & Tanczer, 2021; Tanczer, et al., 2018; West, Kraut, & Chew, 2019). For instance, scholars have noted that values of safety and security are frequently pitted against privacy. Privacy discourse, however, often fails to address how gender conditions an individual's exposure to harms arising from digital systems (e.g. Allen 2011) and how gender's intersection with vectors of race, indigeneity, and disability shape and amplify distinct forms of vulnerability, resulting in a distribution of 'smart' technology-driven harms that fall predominantly onto already-marginalized groups (see, e.g. Abdur-Rahman & Browne, 2021; Benjamin 2016; Broussard, 2018). Building from critiques of the insufficiencies of the current ethics discourse around 'smart' futures (e.g. Mattern, 2021; Sadowski, 2020; Sadowski & Bender, 2019), we aim to foster a productive space wherein critical feminist perspectives might lead to alternative methods for surfacing and framing ethical issues in anticipated 'smart' futures.

In particular, we are interested in addressing the following questions and cultivating a robust discussion for anticipating 'smart' failures through a feminist lens: How do foresight practices aarive at framings of tradeoffs in values? How do these framings channel possibilities for ethics inquiry in the present? What would it look like to reconstruct these imaginaries through a feminist ethics of care? Our hope is to generate ways for alternative imaginaries to reshape ethics discourse around 'smartness' in sociotechnical systems utilizing a feminist approach.

We'll open the session with a brief presentation to frame the conversation, then shift into parallel breakouts that will aim to reframe imaginaries of values trade-offs in sociotechnical systems across a

variety of scales, from the body to the home to the workplace to the city. We'll reconvene at the end to invite participants to share insights, questions, and tensions emerging from each breakout conversation.

15:00-16:30
<u>Curated Session: Holoptic Foresight Dynamics: Collective Perception of Emerging Realities to Empower the Co-Creation of Imaginative, Novel and Transformative Futures</u>
Frank Spencer, Ashley Bowers, Bárbara Ferrer Lanz and Michael Compton

When it comes to futures thinking, the role of technology usually gets all the attention. However, the future is about people – technology is a co-evolutionary helpmate – and this means that we will only experience generative futures if we actively promote a very different way of "being human."

To this end, it is imperative that we work to "democratize the future." This means that we must find a way to open the future to all voices and empower humanity with the tools to create aspirational change and transformation. It's not enough to identify trends or alternative possibilities if we are going to truly design better tomorrows. We must actively foster an intentional evolution toward a collective and cooperative futures-orientation in humanity - in our businesses, institutions, cities, governments, and individual lives. We call this evolutionary dance Holoptic Foresight Dynamics (HFD).

"From the Greek roots holos (whole) and optikè (see), holopticism means the capacity for an individual to see the whole as a living entity in the collective in which he/she operates... In a holoptical con-

text, the individual knows what to do because he/she gets informed by the whole. Actions don't need to come from a blind chain of command. Individual and collective actions emerge at crossroads of rules and agreements, player's roles, individual personalities and styles, the current configuration on the field. Every individual action modifies the whole which in return informs the player about what to do next, and so on. An unceasing feedback loop allows for the individual and the collective to communicate with one another." Collective Intelligence Research Institute

Originating from this holoptic or "many-eyed" vision that displays anticipatory capabilities - a common attribute of dragonflies - Holoptic Foresight Dynamics posits a change in our cosmological narrative and actions from 'separate but connected' to 'the whole as a unique entity,' transitioning humanity from systems based on competition to a cooperative evolutionary capability that activates perception of emerging futures, and thus generating the co-creation of novel and transformational realities. As a result, the practice of foresight and anticipation is seen as more than an external literacy and methodology for knowledge development, strategic formation, or problem solving; an HFD approach fertilizes a foresight noosphere for the recognition of novel and transformational systems in the face of large-scale shifts across all domains.

HFD draws on the fields of evolution, complexity science, anticipatory theory, sociology, regenerative design, organizational transformation, and consciousness studies to demonstrate the critical, organic, and participatory nature of foresight (see supporting research at the end of the abstract).During the session, Frank Spencer will present the foundations of HFD, setting the stage for the other panelists to provide specific actions/applications related to their areas of exper-

tise and impact. Our first panelist, Ashley Bowers, will discuss HFD from the lens of ecological development – climate change, evolutionary biology, and environmental justice. Our second panelist, Bárbara Ferrer Lanz, will provide insight on the connection between HFD and social development, pulling from her convergence of her consultative experiences across Latin America and Europe in anticipatory thinking, strategy, psychology, systems thinking, and eco-social re-generation. Our final panelist, Michael Compton, will speak to the impact that HFD will have on innovation across both commercial, economic, and governmental sectors.

Once Frank arms the participants with an understanding of HFD and each of the panelists share their unique viewpoints, all attendees will engage in an applied exercise to explore the larger ramifications of HFD on people and planet. Using a scanning framework known as Point of Impact, attendees will gather in small groups to engage in discussions on how HFD and the perspectives they heard will impact how humans think, frame, connect, use, and produce in a future of cooperative evolutionary perception of emerging realities. The questions provide a repeatable framework that apply HFD to real world needs.

15:00-16:30
Techniques Workshop: A Future Design Workshop on Inequality
Moinul Islam and Tatsuyoshi Saijo

Future Design is a new movement among Japanese researchers and stakeholders. The core of this movement is to know what types of social systems are necessary if we are to leave future generations sustainable environments and societies. To achieve this, we must design

social systems that activate a human trait called futurability. This trait counts on the human nature of considering future generations to improve their living as this decision and/or action would ultimately bring happiness for human beings as a whole, even if the present benefit decreases. The imaginary future generation is one method to study which would produce futurabiliy. This workshop is designed to implement the concept of the imaginary future generation to deal with the increasing inequalities in our society. The workshop will take approximately 90 minutes and it can be structured in real-time based on the number of participants.

15:00-16:30

Techniques Workshop: Activating Public Agency for the Future of Food: A Collaborative Role-Playing Game

Charlotte Biltekoff, Elizabeth Hoover, Christy Spackman, Db Bauer and Sara El Sayed

What will the future of food be like, and who gets to decide? In the last decade, a new set of entrepreneurs and venture capitalists have brought Silicon Valley style innovation and business practices to the food system, offering visions for the future that now circulate across fast food restaurants, grocery stores, and the media. Their top-down, technology-centric approach treats food more or less like software, and or at least like any other consumer good circulating through contemporary economies. In the process, they frame eating public(s) as passive end points in a system imagined as amenable to whatever disruptive innovations can garner enough capital to make the transition from promissory narrative to edible reality (Guthman and Biltekoff 2021; Lupton and Turner 2018; Wilbanks 2017). We see this top-down approach to imagining the future of food as a non-disruptive disruption (Goldstein 2018): it fails to offer a novel vision for

public participation in imagining, setting the direction for, or governing the food system. Instead, this top-down approach imagines the public as "consumers in waiting" and approaches communication solely in order to secure acceptance of potentially controversial technologies (Biltekoff and Guthman In Revision; Rajan 2006).

We understand that this top-down approach has reproduced historical and environmental injustices into food systems and ecologies (Hatch, Sternlieb, and Gordon 2019) in ways that pre-determine which types of tastes are ascribed to which bodies (e.g. Hobart and Maroney 2019). We start from the premise that the intersection between body and foodstuff is more than a site for eliciting desire; rather we understand the sensory labor occurring when body and food meet (Spackman and Lahne 2019) as a powerful site for activating new anticipatory practices and making public already-existing anticipatory practices overlooked by current anticipatory regimes and their sensory politics (Spackman and Burlingame 2018). In short, we use tasting as a method for performing how one might "remake" participation in food futuring (Konrad et al. 2016; Chilvers and Kearnes 2021).

In this 90-minute Techniques Workshop, we bring together insights from anthropology, food studies, science and technology studies, food science, sustainability, and environmental policy and management to explore how experiential gaming influences how and where people can imagine themselves as agents in influencing the future of food. Our approach, piloted at the University of California Humanities Institute-funded Unbounding food futures: an experiment in co-conjuring workshop (April 2022), and subsequently refined, invites participants to reimagine their roles in the food system. The multi-layered game asks, in different ways, "What if the food system was

open to your tinkering and agency at any point. Where would you enter? What would you do? How would it relate to what you currently experience and to what others – human or not – experience?"

By situating the future of food through individual eaters' desires, fears, memories, cultures, religions, and such, this suite of techniques connect anticipatory practices around food with eaters' pasts, presents, and anticipated futures (c.f. Dolejšová et al. 2020; Voß and Guggenheim 2019). Our approach seeks to address lacunae around whose food futures matter, lacunae entrenched through consolidation of food production over the twentieth century and further solidified by the current technocratic turn in food futuring. It additionally works to address the disenfranchisement implicit in the "vote with your fork" ethos popularly promoted by some food activists. We are especially concerned with creating methods that acknowledge the complexities in forwarding specific food futures centered around a universal concept of justice, when instead we see a need for approaches centered in the promotion of cultural as well as physical reproduction (Hoover 2017). We theoretically and methodologically draw on sustainability insights around system lock-in and constraints (Kuokkanen et al. 2017; El-Sayed and Cloutier 2022), the twentieth-century tradition of readymade art (Gildersleeve and Guyotte 2020), and a recent turn to using transversal media as a mode of activating aesthetic and epistemological shifts (Bauer 2021) in practices of speculating about the future.

Participants in this 90-minute session will participate in a role-playing game. In this game, participants will be split into teams. Each team will select a role within the food system, a future food systems scenario, and a set of challenges. As participants work through the challenges, they will be prompted to think of the food system not as

closed, but rather open to their individual and group taste, tinkering, power, and agency through prompt cards. Finally, participants will be invited into co-reflection alongside the curatorial team to explore the strengths and weaknesses of these embodied approaches in activating new anticipatory practices and making public already-existing anticipatory practices.

16:45-17:45
Keynote Panel |Laura Cechanowicz, Ed Finn, Lauren Keeler, Punya Mishra
<u>Democratizing Futures, Hosted by the Center for Science and the Imagination</u>

TEMPE, ARIZONA, NOVEMBER 17

4TH INTERNATIONAL CONFERENCE ON ANTICIPATION TEMPE, ARIZONA

NOVEMBER 17, 2022

09:00-09:45

Keynote | *Aarathi Krishnan*

The master's tools will not dismantle the master's house

The practice of anticipatory practice and foresight is not neutral. It is conditioned by society's cultural values, its economic systems, and its capacity for collective imagination. Pursuing rigid frames of understanding risk, crisis and progress forces people to bend their choices, their perspectives and their sense of selves to fit those rigid frames, and therefore reducing the breadth of their collective humanity to templates that are designed and understood by a privileged few.

But, these realms of imaginings and design of democracy, progress, social good, and what it means to thrive have traditionally followed a static, rigid view of these ideas, steeped in pillars of a Northern dominated world order. The very practice of foresight can be steeped in bias and surface level rhetoric without interrogating what is needed for us to change and adapt to an uncertain world.

What is the result of futures that become a singular truth? The systems and frameworks that have served us to date may have improved outcomes for many but haven't done so equally and have been at significant cost. The global pandemic showed in harsh light the fundamental cracks in our global systems and structures. Our systems, our societies, our actions, and our behaviors were a million wounds in a structural ecosystem that was rupturing at its sides. The system has now blown wide open, revealing to humanity's collective shame the ways in which we have all failed: to lift people out of poverty; to make healthcare sustainable and accessible; to safeguard our planet; to make the world more equal, just, and safe. We have failed, not because the challenges were impossible to solve, but because of our collective lethargy and apathy to truly reimagine a completely different status quo.

10:15-11:45
Independent Paper Session: Decolonizing Anticipation

Paglalayag Tungo sa Hiraya, Awakening the Unconscious Imagination and Igniting Ethical Aspirations: The Case of Hiraya Foresight
Shermon Cruz and Nicole Anne Kahn-Parreño

This paper aims to introduce, unpack, explore, make sense, and share Hiraya Foresight as a futures concept, framework, and methodology to reconceptualize foresight, reframe anticipatory processes to enable the self and communities to reimagine visions of the future. This indigenous foresight process offers to strip the husk and break the shell of conscious, colonial anticipation and reveal and lib-

erate unconscious imagination that enables ethical aspirations to emerge.

The paper introduces and examines the context, purpose, and process of the Four Waves of the Hiraya Foresight Framework. These were constructed through the use of the Engaged Foresight approach, through workshops, a literature review, and an action-learning approach. The first wave, lawak looks into the breadth of foresight. The second wave, lalim looks into the depth of foresight. Tayog, the third wave, looks into the peak of foresight. Finally, the fourth wave of foresight kababaang-loob contemplates the nature, values, and wisdom of foresight.

The paper shares the processes, experiences, and impacts through five case studies where the Hiraya Foresight Approach was applied. The paper shares the impacts of Hiraya Foresight in democratizing and indigenizing futures literacy through the Philippine Futures Thinking Society's vision of igniting the Filipino Hiraya through the power of foresight.

The paper describes and offers Hiraya Foresight as an indigenous approach to decolonize futures studies and foresight practice.

Anticipating decolonial futures: the case of Brazil
Beatriz Carneiro and Fabio Scarano

Globally, post-development perspectives challenge the hegemonic vision of development and its derivative notion of sustainable development. We perceive the emergence or re-emergence of these initiatives and philosophies as a result of decolonized anticipatory processes. For instance, in the Global North, degrowth and ecofeminism

anticipate futures where economic growth and patriarchy do not belong. In Latin America, Buen Vivir and the rights of Mother Nature are embedded in national legislations of Andean countries. In Brazil, post-development alternatives are not mainstream yet. However, the country with its nearly 300 indigenous peoples and languages is fertile ground to examine options to decolonize futures. This paper asks: 1) How present in Brazilian culture are post-development philosophies from elsewhere? 2) How do selected Brazilian indigenous peoples anticipate? 3) How elements related to 1 and 2 are being/can be incorporated into futures literacy programs in the country? Our results indicate that blending anticipatory practices of Brazilian indigenous peoples with those related to post-development alternatives in the Global North and South, and mainstreaming them through futures literacy, will be essential for the emergence of decolonial futures.

Currently, the global debate about planetary well-being and better futures is structured around two possible trajectories: following an orthodox development model or opting for sustainable development. However, encompassing the many dimensions of a desirable future within these modern/post-modern options narrows the possibilities for alternative solutions. In contrast, the development paradigm is not universally accepted, given that premises – such as unlimited economic growth – and practices – such as to underestimate developing nations -, are challenged by other worldviews (Escobar 2015). As a consequence, a set of alternatives to development originated both from the Global South and North are increasingly being adopted and put into practice. These can be clustered under the name of post-development, gathering the renewal of ancestral philosophies, and concepts emerging from social movements, in the name of a more ecologically wiser and socially just world (Kothari et

al. 2019). The rise of such movements can be related to the re-emergence of sustainability as a moral value and possible utopia within our societies (Scarano 2019), especially regarding the human agency of imagining what those desirable futures might look like (Tonn 2021). In the Global North, degrowth and ecofeminism anticipate futures where economic growth and patriarchy do not belong. In Latin America, most of the post-development movement draws inspiration from ancestral indigenous knowledge, as reflected in philosophies such as "Sentipensar", "Buen Vivir", "Sumak Kawsay", "Via Campesina" and others (Kothari et al. 2019). For example, the rights of Mother Nature are embedded in national legislations of some Andean countries (Acosta 2016). Given that anticipation can be understood as a forward-looking attitude and the use of the former's result for action (Poli 2017), we perceive the advance of these initiatives and philosophies as a result of decolonized anticipatory processes. Even though Brazil displays continental dimensions (it is the biggest Latin American country - and houses the world's largest biodiversity as well as almost 300 different spoken languages), post-development alternatives are not as mainstreamed in the country as they are for its neighbors. However, this rich and diverse scenario is a fertile ground to examine options to decolonize futures. In this sense, indigenous philosophies and other Brazilian post-development emerging concepts can be crucial in anticipating decolonizing futures and facilitating educational practices in futures literacy, enlarging "possibilities for yet-unimaginable alternative futures to emerge" (Amsler & Facer 2017). Given this context, the present paper seeks to answer the following questions: 1) How present in Brazilian culture are post-development philosophies from elsewhere?; 2) How do selected Brazilian indigenous peoples anticipate?; and 3) How elements related to 1 and 2 are being/can be incorporated into futures literacy programs in the country? The first question is being addressed through a systematic review of literature on post-development, focused on con-

tents being produced/used in Brazil. Using key-word oriented research on multiple databases, and the previous experience from a similar experiment conducted by the authors on global scientific literature around post-development transition discourses, an analysis of the current Brazilian scenario is possible. Results demonstrate that the incorporation of post-development concepts in Brazilian territories is still incipient in comparison with other Latin American countries. Nonetheless, ancestral knowledge derived from the perspectives of indigenous peoples is becoming increasingly relevant to the creation of futures. In order to investigate how these groups anticipate, Brazilian indigenous literature and digital materials are being studied. Some examples are books by authors Davi Kopenawa and Ailton Krenak, as well as works derived from Selvagem and Liv-Mundi (seasonal events focused on futures literacy and dialogues) (Kopenawa and Albert 2010, Krenak 2019, Pãrõkumu and Kẽhíri 2019). Many of their anticipatory practices come from the exploration of their subconscious through intuition, dreams and reminiscing; others might be reached through storytelling and/or ritualistic practices – aspects not usually included in modern society daily life from which we could benefit. Finally, the last question aims on the construction of the technical expertise to reflexively use the future to perceive and inform actions in the present through education (Facer & Sriprakash 2021). Anticipated future states of the world may require present changes in behaviors (Tonn 2021), thus, formal educational processes dedicated to futures literacy will be required throughout the world. In Brazil, the topics investigated above are being incorporated in local festivals and gatherings – in spaces such as Selvagem and LivMundi. However, they are not encountered in many formal educational institutions. This shall be examined even further by the authors, mainly observing if post-development and/or indigenous practices can be incorporated into formal educational spaces. In conclusion, our preliminary results indicate that

blending anticipatory practices of Brazilian indigenous peoples with those related to post-development alternatives in the Global North and South, and mainstreaming them through futures literacy, will be essential for the emergence of decolonial futures in Brazil and elsewhere.

10:15-11:45

Techniques Workshop: Collective, Science-based Climate Futuring: Making 'memories of the future' by combining IPCC scenarios, foresight and storytelling
Manjana Milkoreit, Patrick Keys and Michele-Lee Moore

Climate change scenarios used in the Intergovernmental Panel on Climate Change (IPCC) assessment reports, such as the Shared Socioeconomic Pathways (SSPs) and Representative Concentration Pathways (RCPs), depict a range of plausible global and regional changes of the global climate and economy into the future. While these scenarios are intended to inform decision-makers and their responses to climate change, much climate action - mitigation, adaptation, and system transformations - will be initiated in local contexts. Significant challenges remain in making global-scale projections legible and usable by local-scale stakeholders. Therefore, innovative methods are needed to bridge the gap between these spatial scales to support processes of imagining, anticipating, and planning for just and equitable futures. In addition to ongoing scientific efforts to downscale climate models and their results, story-based approaches can make substantial advancements in generating broader public understanding of and engagement in climate futures. This is partly because 'scenarios as stories' represent a more textured and vibrant representation of future worlds, allowing participants to explore how their daily lives, values, and habits can be mapped onto differ-

ent scenarios (i.e., making 'memories' or mentally simulated experiences of the future). Thus, methods that integrate scientific modeling, downscaling knowledge about the future, collective storytelling and imagination contribute to efforts to make climate futuring not only a public good, but also help design spaces for public climate anticipation, and empower stakeholders to engage in the co-creation of their own futures.

This session will enable participants to develop local-scale understandings of SSP-RCP scenarios and generate shared local imaginaries of the future using participatory, story-based methods. Given the host city is Tempe, we will use the Phoenix metropolitan area as the focal point for the event. Participants will be divided into two groups, and each group will work with one specific SSP-RCP scenario. We will specifically draw from two integrated climate projections, using an optimistic scenario (i.e., SSP1-RCP1.9) and a less optimistic one (i.e., SSP4-RCP6.0). Both groups will begin with a discussion about the pre-prepared scientific evidence base for SSP-RCP scenarios for the Phoenix region, Arizona and the American Southwest. However, each group will use a different type of input - local-scale translations of global scale scientific information - for their discussions: one group will receive input based on scientific articles; input for the other group will be based on news reporting and public discourse online. These two sets of input will be prepared by the session organizers ahead of the conference. Next, we will employ a participatory futures method (a version of the three horizons method) to collectively imagine scenario-specific human futures. Using a book-sprint approach, the session will generate at least two prototype climate-fiction stories depicting a future Phoenix.

The session is designed so that all participants have the opportunity to experience and learn how to downscale insights from global and

regional models through participatory story methods. Our hope is that participants can integrate these methods into their own research, e.g., using similar approaches to facilitate and study the effects of local stakeholder workshops, potentially leading to enhanced imaginative capacity regarding climate future among both researchers and political actors. Moreover, all the workshop materials will be made available at the end of the session, including the instructions for interpreting global-scale climate science for local use, the tutorials on story-based futuring, and any other additional materials we use or generate in the workshop.

10:15-11:45
Techniques Workshop: Strategic Artifacts: Tools and Activities for Anticipation
Tom Weis, Leo Blanken, Charlie Cannon, Elizabeth Kistin Keller and Kelesy Abel

What role might physical artifacts play as we anticipate uncertain futures? This question grew out of a collaboration between strategists at Sandia National Laboratories and designers at the Altimeter Group following an exploration of emerging global dynamics. Drawing upon a catalog of peer reviewed trends, we developed an exercise to enable participants to confront futures that might be catalyzed by the dynamic interactions of trends across science, technology and engineering; world order; human geography. Decentering any single trend invited participants to think more comprehensively as they work to anticipate and adapt to near future situations.

As the project has evolved, we have begun to work with subject matter experts from a range of disciplines and backgrounds. Early col-

laborators helped articulate what a world with increasing competition in global commons, shifting alliances or a loss of US technological advantage might look like. Authors from organizations working on nuclear security, environmental threats, and other challenges were asked to develop brief written scenarios, based on their unique areas of expertise.

Drawing on foresight studies, experiential futures and discursive design, our team began to create artifacts that reflected what people might encounter in these futures. Unlike a written narrative that is linear and structured with a beginning and an end, objects can be generative, revealing new readings, meanings or associations we might not have considered. At the same time, objects anchored discussions in tangible situations. For example, we recently worked with officers from the Naval Postgraduate Schools' Applied Design for Innovation program from the Defense Analysis Department. Students in the NPS program have deep operational expertise; their interactions with our artifacts opened up a broad range of perspectives and viewpoints. The discussions that ensued were imaginative and far-reaching.

10:15-11:45
Curated Session: Performative Postnormality
Wendy Schultz, Maya Van Leemput and Christopher Jones
The Center for Postnormal Policy and Futures Studies will curate an interactive, participatory, and experiential session that will explore postnormal times and anticipate transnormal times. Postnormal Theory develops approaches to the analysis and understanding of Postnormal Times (PNT): an era in which old orthodoxies are dying, new ones are emerging, and very few things seem to make sense. PNT is a product of the forces shaping our globalized, networked world: ac-

celerating change, uncertainty, and ignorance. Negotiating PNT requires new forward-looking pathways based on a critical understanding of complexity, transcending contradictions, and the ever-present potential for chaos. PNT requires working with a diversity of perspectives and shared values, which take us beyond dialogues to polylogues — creative spaces for learning and unlearning. This interactive experiential session will engage participants in exploring post-normal theory and its application by role-playing the core concepts – e.g., chaos, complexity, contradictions – as they emerge in relation to specific issues and topics chosen by participants. The activity will co-create emergent stories of postnormal futures and anticipate the potential for transnormal futures.

10:15-11:45
Curated Session: Futures Thinking in K12 Education
Peter Bishop, Lisa Kay Solomon, and Ruth Wylie

The question posed by the Conference Committee as part of the Critical Anticipatory Capacities theme is "What is the role of educational institutions in fostering capacities for anticipation and for critique of anticipatory work?" The simple answer is that we should teach about anticipation and the future in every classroom in the world. What better way can educational institutions advance this discipline other than by doing what they do best – teaching the next generation? The approach for this session is an interdisciplinary discussion on how best to get that done.
The Discipline of Anticipation was created for these times in history when forces come together to create a new order. We are at one of those moments. The forces in this case are 1) the increasing rate of change, 2) the increasing frequency and depth of disruptions, 3) the unprecedented challenges to our way of life, and 4) the emerging

technologies that promise to redefine what we are as human. Change, disruption, challenge and technology are not new, but we are experiencing more of them and more rapidly than almost any other generation in history.

These changes call for new forms of human organization – an economy and a way of life that respects the environment, a form of governance that goes beyond political advantage, and a culture that balances individual and community welfare. A requirement for these transformations is to change how we prepare the next generation to be successful in these turbulent times.

Education has been awash in proposals to update and reform itself for more than a century although few have actually changed the student experience during that time. A popular meme compares the history of the office and the classroom. It is said that Tom Watson, who took over IBM in 1915, would not recognize what is going in an office today whereas John Dewey, his contemporary, would know exactly what was going on in a classroom.

Amid these proposals is the opportunity to include the emerging discipline of Anticipation as an integral part of the standard curriculum, the study of futures. This new discipline is already making its way in the adult world: universities have been offering degrees in futures studies to graduate students for more than 50 years. For example, the University of Hawaii at Manoa created a futures concentration in Political Science in 1971, and the University of Houston-Clear Lake established its Master's degree in 1975. Since then, graduate programs have opened in Finland, Taiwan, the United Kingdom, Korea, Australia, Mexico, Germany, South Africa and other countries. More recently, this work has expanded to undergraduate degrees with Arizona State University opening the School of the Future

of Innovation in Society in 2015 which offers the first bachelor's degree in the subject.

10:15-11:45
Techniques Workshop: Necessary Tomorrows
Brett Gaylor

Necessary Tomorrows is a multi-modal documentary project that uses science fiction to bring to life futures that at first seem like fantasy: animals are people, capitalism is banned from outer space, and Artificial Intelligence revises history. We will meet the people making these futures: the writers who dream them, and the activists, scientists and thinkers who are trying to make these futures a reality today. By spending time in their imaginations, the project aims to help everyone build a skill of increasing importance for modern survival: how to live in the future.

In this talk I will present extracts of the podcast series produced by myself, Wolf At The Door Studios and the Doha Debates. The series contains three fiction episodes written by science fiction writers Deji Olukoton, Christopher Brown and Quelemia Sparrow. These are paired with three non-fiction episodes that interview these writers about their process, and also interview activists in the present who are working to create the better futures they imagine.I will also present scenes from the documentary film being produced in concert, focusing on interviews with the writers who have dreamed up the following futures:

Future 1: The Rights of Nature
Brown has written The Last Impala for Necessary Tomorrows. It follows Wanida Chao, a reluctant defence lawyer appointed by a US

federal court to defend a climate refugee accused of murder. Chao must defend her client not for killing a human, but for killing an ecosystem. Set in 2065, the story imagines that the nature has been given the right to exist, a legal quandary made more difficult by the increased need of the human population struggling with the impact of climate change.

In 2022, Mari Margill is building a movement to see this future realized. The Executive Director of the Center for Democratic and Environmental Rights helped create the world's first rights of nature laws in Tamaqua Borough, Pennsylvania in 2006. The borough amended its constitution to give nature rights to stop the practice of dumping toxic sewage sludge. Two years later, Mari assisted the government of Ecuador in amending their constitution to recognize the inherent right of nature to flourish. In 2022, the movement now sees dozen of court cases across the Americas, Africa, Asia and Europe, as well as a grass roots movement of activists dissatisfied with environmental regulations that only serve to facilitate human use of nature. Like the civil rights movement, the rights of nature seeks not to "give" rights, but to recognize inherent rights and codify them in law.

Two cases will seek to create earth jurisprudence in 2022. The White Earth Band of Ojibwe have recognized the rights of Manoomin, or wild rice, and are taking Enbridge to tribal court for restricting access to water. The Sauk-Suiattle are taking the City Lights power company to court, with Salmon as the plaitiff, for building dams that threaten salmon's future. We will follow these cases, and the grass roots movement that they are inspiring, to change our relationship with nature.

Future 2: Extractivism in Space

Deji Olukoton pens our second story about the politics of space exploration. Deji's story imagines a future where humanity has been given an opportunity to overcome the climate crisis. A Lagrange point is found (a point of gravitational equilibrium in the solar system that makes retrieval possible) where asteroids have deposited enough cobalt to transition to 100% renewable energy. As the news transforms markets and politics, a corporate space company announces it will send a spacecraft to harvest the minerals. But as the world watches the countdown, an eco-terrorist group destroys the rocket and gathers four representatives of humanity - a space capitalist, a cobalt miner, a director of the Indian space program, and a fisherman to negotiate a plan - to share the resources.

This fictional story references shifts in space exploration happening today. In April 2020, President Trump signed an executive order proclaiming that "Americans should have the right to engage in commercial exploration, recovery, and use of resources in outer space." NASA's Artemis accords, a set of bilateral agreements that are part of the agencies plan set to land a human on the moon in 2025 and bring minerals back to earth.

"NASA's actions must be seen for what they are: a concerted, strategic effort to redirect international space co-operation in favor of short-term U.S. commercial interests", wrote Aaron Boley and Michael Byers in the journal of Science. The two University of British Columbia professors are founders of the Outer Space Institute, a network of progressive scholars who are concerned about the colonial turn of space exploration. These activists fear that the non-commercial principles enshrined in the 1966 UN Outer Space Treaty are

threatened by the same "rule of capture" principles that drove colonization here on earth.

Future 3: Indigenous AI
Our third story is a collaboration between Blackfoot filmmaker Ahnahktsipiitaa (Colin Van Loon) and Musqueam actor and playwright Quelemia Sparrow. They've imagined a future where Disney™has created an AI version of a "traditional" Blackfoot man. It acts in cartoons and hangs out with you in the Metaverse. But what happens when a group of Indigenous hackers replaces this corporate AI with an Indigenous AI, built by Blackfoot programmers from real Blackfoot language and worldviews?

Quelemia & Ahnahktsipiitaa's story is inspired by Indigenous computer scientists, academics and activists training AI systems on Indigenous languages, and attempting to encode Indigenous worldviews into algorithmic systems. "Given the long history of technological advances being used against Indigenous people", the authors of the Indigenous AI Position Paper write, " it is imperative that we engage with this latest technological paradigm shift as early and vigorously as possible to influence its development in directions that are advantageous to us.".

13:00-14:30
Independent Paper Session: Participatory Futures

Futures Workshops: from fragile fictions to sticky stories
Hillary Carey and Jessica Meharry

Very long-term visions can help drive momentum by providing ambitious, optimistic outcomes to work toward. Participatory futuring methods invite a collective of people to define their preferable futures (Jungk & Müllert, 1987, Dator, 1993, Gidley et al., 2009; Ramos, 2017; Nikolakis, 2020; Paniagua & Cornejo, 2020). However, what happens with these co-created visions after the session has not been fully explored. Futures Workshops help create long-term visions of the future, but they don't describe how those visions can influence people beyond the workshop, finding sustainability and staying power for changing existing structures. In this paper, we will discuss our practices to turn participatory visions into sticky stories that motivate action. We focus not on the methods to elicit future visions but on the practices that might strengthen them.Participatory design, design justice, future studies, and critical theories inform our approaches.

As designers and antiracist advocates, we share our experience using futures workshops and design techniques with a JEDI (Justice, Equity, Diversity, Inclusion) task force at a U.S. arts college. Our goal for the workshops was to look beyond the incremental strategic planning that is the typical course of action for institutional antiracist work and imagine preferrable reparative futures. Our hope was that participants could think of bolder change if invited into a futuring activity, and that such ambitious and creative thinking would help them gain momentum and excitement for what is possible.

The workshops were revelatory for participants in the moment, offering a new perspective and permission to dream of success. But beyond the workshop space, the visions were not referred to in significant ways. It took additional consideration and interventions on our part to revive those visions so that they remained vivid and coher-

ent. We will share the experience of developing our intervention: a summer program that invites additional collaborators to bring the visions to life and share glimpses of an antiracist college community. Using co-design and thinging, we will report on this experiment to turn the naïve fragile fictions of workshop outputs into sticky stories that serve as anchoring visions for justice-oriented action in the present.

The concept of naïve fragile fictions (Blythe et al., 2016; To et al., 2021) inspires our thinking about respecting, critiquing, and building on ideas generated in participatory workshops. We want to extend that concept by reflecting on the use of visions as an end-product from these workshops and as a leverage point for change. We understand the concepts from the workshop as 'naïve' due to the limited amount of time participants had to develop them, 'fragile' because they might need to be protected from the critique of people outside of the context of the workshop, and 'fictions' in the sense that they are not yet true. However, these naïve fragile fictions hold bold ambitions for structuring a liberatory learning institution. If given stickiness and shared as persuasive stories, they have the potential to inspire small and large-scale change.

Our initial assessment showed two critical aspects of fragility: the fragility of moving away from a supportive and creative space and the fragility of pressure from the urgency of current issues and daily life. We conceive of this as the resistance that visions face as they move from the workshop into spaces of influence.

The first tension arises between the safe and inclusive environment of the workshop and the harsh critique that ambitious and radical dreams about the future are likely to receive. For example, after the workshop, an executive came into the online space to tour the work. While the team members were energized and inspired by the vision-

ing, the executive lectured on how unacceptable these visions would be to important funders. This reaction was deflating. Those in power tend to resist disruptive concepts, impeding progress towards more just futures of the organizations. We question whether the actions for racial justice must be approved by funders first or fostered at a grass-roots level.

The second space of resistance, which as workshop organizers we underestimated, is how easily hopeful visions can be pushed aside for more immediate concerns and the tyranny of the calendar. Without a specific strategy to act on and engage the visions from the workshop, and no materialization to hold those visions clearly, the call to maintain the concepts was missing. However, when we asked for volunteers to meet up on a Friday afternoon to begin translating the workshop themes into designed experiences, eight participants returned to the boards and helped begin the process of revival.

We will be using creative, design-based narratives to make radical visions salient and spark emotional investment as sticky stories (van der Stoep & Aarts 2012). We will share our emerging process for metamorphosing these nascent visions into a more tangible and durable object of concern (Binder et al., 2012) around which multiple stakeholders might align. This transformation may include the creation of context-rich narratives through scenarios, storyboards, journey maps, or short films and animations. Further, this alignment would then provoke concrete action and perform the rhetorical work necessary to guide action in the present.

We propose that there is value to celebrate and sustain the life of long-term visions created in workshops. Futures Workshops tend to

move quickly on to prototypes and next steps. This, however, privileges incremental change over holding a long-term vision for bigger change. Both are important in shaping institutional shifts. In the future, we will structure workshops to prepare for the resistance that comes as the energy of the workshop dissipates. Building this anticipation into the workshop design offers a better chance at accomplishing the work of developing shared future visions that have staying power.

Barrio Innovation: Visions from Latinx youth in Phoenix
Marta Berbés-Blázquez, Vanya Bisht, Regional Carrillo, Monique Franco, Mandy Kuhn and Jorge Morales

For the past decade, cities have been looking to nature-based solutions to combat environmental issues that impact the quality of life of city dwellers. This presentation will introduce a university-community partnership to improve greenspace in Phoenix, AZ. Greenspace is an important component of combating climate change in this desert city as native vegetation can provide cooling, among other benefits. In this project, a group of researchers from Arizona State University partnered with a school teacher from Academia del Pueblo, a middle school that serves predominantly Latinx and low-income students, to imagine better and greener futures for their community. Through the use of participatory action research techniques such as photovoice, scenarios, and storyboarding, middle school students named concerns and strengths of the community and envisioned desirable futures. We call our process 'barrio innovation', which is an approach to innovation based on design thinking but rooted in and driven by community. In this presentation, we reflect on our journey, which is emergent and continuously co-evolving,

and invite others to reflect on the power of anticipatory tools in community settings.

Eating Temporalities: Food as an artifact of past and future environments, and a medium for multi-temporalities
Allie Es Wist

Artifacts are meant to be carriers of information through time—a role particularly fraught when transmission is undertaken across timescales beyond the comprehension of individual lives or remembered histories. The materiality of artifacts challenges the veracity of memory from the past, as well as how we transmit meaning to the future. Artifacts meant to speak across time are compelling to study especially due to a particular paradox: memory is often place-dependent, but places and landscapes are changing more rapidly than ever due to both technology and climate change. Thus, objects which reveal changes to place and environment, in particular, are both especially slippery and especially powerful. In this paper, I outline various theories on memory and temporality in relationship with the environment to suggest that food, and the related senses of smell and taste, can combine to serve as potent means of remembering landscapes, places, and environments as they change over time, and especially through rapid changes in the face of the climate crisis, the Sixth Mass Extinction, and Capitalocene-induced ecological damage. I engage an interdisciplinary network of scholars to explore the potential of sensory 'artifacts' in environmental temporalities. I introduce environmental vignettes of taste and smell from my own sensory research, and combine this with an analysis of work from academics and artists who have postulated the role that food might play in connecting us to past or future ecosystems. I argue that specific embodied experiences of the chemical senses can act as traces of past

temporal scales and changing environments, as well as speculative traces of the future. The manifold ways in which food mobilizes the senses make it a powerful medium through which to transmit information, especially concerning ecosystems, agriculture, or human/nonhuman land entanglements. Food has a symbiotic relationship to memory, whereby it continually co-creates connections to other times and places. This paper seeks to answer the question: can the sensory experiences elicited by food alleviate change blindness? Can taste and smell reveal the past and point towards future states of the environment in a way that enfolds multi-temporalities? This paper builds on Donna Haraway's premise of situated knowledges, and extends into questions of embodied cognition and environmental awareness, especially in conversation with Anna Lowenhaupt Tsing, Timothy Morton, Brian Massumi, and Beatriz Cortez. It extends the potential for sensory experiences of multi-temporalities into the future through Karen Barad's concept of diffraction, and Georgia Born's work on simultaneity. Ultimately I propose that a renewed environmental consciousness and capacity for futures imagination in the age of climate collapse can be enhanced from the creation of non-discursive knowledge based in food.

13:00-14:30
Independent Paper Session: Public Futures

Our Biological Future: Public Deliberations & Social Empathy, a case study
Lauren Lambert, Dorit Barvley and David Tomblin

Inspired by the suite of methods put forth by anticipatory governance (Barben et al. 2008; Guston 2014) our project aimed to inte-

grate expert and public deliberation as key inputs into governance discourse on the future of human genome editing. Expert scenario workshops were held in the Fall of 2020, followed by public deliberations in the Fall of 2021, as part of a three-year project funded by the NIH to use an anticipatory and deliberative approach to the governance of human genome editing. This paper will analyze the role of social empathy (Segal 2011;2013;2017;2018) in the anticipatory process and public participatory technology assessment (Kaplan et al 2021) of human genome editing.

Supporting material: The project employed a novel method for expert input into public deliberation by using future scenarios, generated in the first year of the project with an interdiciplinary and global group of experts, as input for public deliberation materials. In year one of the project, the team interviewed 30 interdisciplinary scholars and experts, and fed key information from the interviews into a card deck, which was used in a scenario workshop with experts to create four scenarios, or plausible future worlds, that feature human genome editing. This suite of methods revealed how different future states could evolve under a set of artificial constraints based on a limited number of "critical uncertainties," reflecting social, technological, economic, environmental, and political issues, which have pivotal effects on the development and future use of human genome editing (Selin et al. 2022 in progress).

During the second year of the project, science museum educators adapted these scenarios to a lay public audience, in a translational effort to integrate the information derived from the expert workshop into the public deliberations. Additionally, the team created unique character cards to stand in the deliberations as stakeholders, as unfolding and evolving stories, to faciliate public deliberation (Boston,

Phoenix, Houston, and online). Over the course of a six-hour deliberative workshop, diverse publics encountered the characters a total of three times, including once in relation to one of the four future scenarios.

Using the social empathy construct, the analysis presented in this paper details survey results, as well as qualitative coding of participant workbooks and interviews with 30 randomly sampled participants, conducted after the deliberations to better understand how our method invoked deeper contextual understanding of systemic barriers and macro perspective taking of social "others" when deliberating upon present values and the future of human genome editing.
Key questions this paper seeks to address are as follows: - How do you stage conversations with publics, with technologically and scientifically complex topics like CRISPr? -What is the role of social empathy in public deliberations around ethically important topics like CRISPr? -How is social empathy constructed or deconstructed in small group public dialogues about the future?

Key dimensions of criticality in participatory futuring with publics
Laura Barendregt, Roy Bendor and Bregje van Eekelen

Participation is an established topic in Futures Studies, Foresight and Futures Research (Andersson, 2018; Jungk & Müllert, 1987; Nikolova, 2014; Popp, 2013; van der Helm, 2007). We have seen the desire to expand the scope of participation in futuring manifested in calls for the democratisation and decolonisation of futures and Futures Studies (Bisht, 2020; Ramos et al., 2019), the rise of futures education and literacy (Facer & Sriprakash, 2021; Miller, 2018), and the embrace of

art and design approaches to make the future more experiential, tangible, and accessible (Candy & Dunagan, 2017; Light, 2021).

While many adopt and advocate for a participatory approach because of its potential to open up futuring to new participants, voices, and interests, it is important to remember that participation often raises as many questions and challenges as it seeks to solve. Writing in the context of Foresight, Ruud van der Helm describes adopting a participatory approach as "deliberately getting entangled in the web of actors and their idiosyncrasies" (2007, pp. 6-7), all of which need to be taken seriously when designing and facilitating a participatory futuring process. This is because within these 'idiosyncrasies', and as argued by advocates of critical pedagogy, lie a range of ways of engaging with the world that are in no way 'neutral': ways of working, collaborating, communicating, imagining, planning, etc., carry worldviews and interests into collective processes and uphold or contest systems of power that exist in that context (Cope & Kalantzis, 2015; Facer & Sriprakash, 2021; Freire, 1970/2005). Simply stated, designers of participatory futuring processes must understand this tangle of power relations as it influences the contexts and outcomes of the processes they facilitate.

Given the strong desire for participation within futuring and an acknowledgement of the challenges that follow participatory approaches, we offer a reflection on the current state of the field and consider how the designers of participatory futuring processes attend to the issues of power that permeate such processes. To do so we conducted a systematic literature review of academic articles on the subject. The review asks questions about the aims, participants, facilitators, methods, and outcomes of these processes, with an emphasis on how questions associated with a critical approach to futur-

ing (Ahlqvist & Rhisiart, 2015; Goode & Godhe, 2017; Inayatullah, 1990) are broached. Our critical approach supports the view that "If the aim is to increase diversity and inclusion, considering the role of power and how it influences equitable decision making and deliberation is paramount" (Andersen, Hansen, & Selin, 2021, p. 11). Our structured survey of the state-of-the-art in the field, it follows, can be seen as a first step in consolidating a critical approach to participatory futuring.

In addition to sharing descriptive data about participatory futuring processes, we also seek to highlight some key dimensions of how criticality can emerge within them. These key dimensions are generated from a broad reading of criticality in Futures Studies, Design, and Pedagogy, and examining exemplary processes within our paper collection. They are by no means exhaustive but include (1) the emancipatory aims of a process, (2) key design decisions, and (3) the reflective capacity of authors (often the designers or facilitators of the processes). By unpacking these dimensions we offer seeds of good practices that can be amplified in future practices.

The tacit promise: how participation is framed in strategic spatial governance to secure political legitimacy and room for manoeuvre in the emerging future
Ferry van de Mosselaer

In spatial governance the need for public participation is commonly acknowledged in academia and in practice. In terms of anticipating the future participation holds a dual promise, that is
- (1) a moral promise containing the obligation to anticipate the future in a fundamentally democratic way taking responsibility for

both present and futures needs and values, and - (2) an epistemological promise to accumulate, mobilize and direct all knowledge and know-how to secure the probability of shaping a collectively desired future.

Over the last decade co-creation or co-production is increasingly advanced as an approach to give shape to participation in the context of strategic spatial policymaking and planning. It is considered as an antidote to the idea that we endlessly need to ask citizens' opinions, before handing the plans, policies and projects back to the professionals to deliver (Albrechts, 2013). Instead, in co-creation citizens are actively involved in the agenda-setting, problem formulation, the shaping of the content of policies, plans and projects and the delivery as well; (Bason, 2010).

In this paper we research the question: 'How the promise of participation sorts reality effects in the formation of strategic spatial governance processes?'. We conducted two extensive case studies over a period of 3 years into co-creative processes of spatial strategy formation in the Netherlands. The first case study involves a strategic policy process, that is the development of the Brabant Environmental Strategy (BES). The second case study encompasses a strategic spatial planning process, that is the development of a vision on Seelig Park area development in Breda.

Whether inscribed in necessity or opportunity, our research demonstrates that there is a strong and genuine desire and effort in government to embrace co-creation in order to alter the course of governance and open up to new ways of engaging with society on the one hand and anticipating the uncertain future(s) on the other. However,

notwithstanding these genuine intentions and efforts, we have scrutinized how the 'framing' of co-creation in these strategic spatial governance processes effectively builds on tacit structural features. These features refer to the implicit ways in which the inherent uncertainty and selectivity of the future are codified and conditioned.

- The first tacit feature relates to ontologically consideration of future as an empirical and manageable reality, rather than a social construct in which different opinions are legitimated to co-exist. The consideration of the future as an inherently empirical and manageable reality fits the traditional understanding of governance as a rational problem-solving system (Christiansen & Bunt, 2014) and a programmatic and linear approach to anticipating the future.
- A second tacit feature relates to the opacity of equivalence as a key premise of co-creation. Equivalence implicates the existence of a universal idea of justice and a transcendental believe in a just future. However, ideas on equivalence and the pursuit of a just future are embedded in fundamentally diverging and often conflicting perspectives, from libertarian ideas on 'equal opportunities', to egalitarian ideas on 'equal voices' and utilitarian ideas on 'equal benefits'.
- The third tacit feature directs to the depoliticization of the outcome. Co-creation is a productive process, meaning that 'something' is designed. However, the challenge in creation processes in strategic policymaking and planning is that the actual reality effects go way beyond the materialized strategy or plan. These reality effects are commonly reduced to static and instrumental ideas on implementation, whereas in practice the reality effects will always be subject to the politics of the 'future-in-the-making' ((Adam & Groves, 2007); cf. (Maze, 2019)).
Herewith, analogous to the tacit promise of technological innovation (Borup et al., 2006; Brown & Michael, 2003; Ruben, 1972) we argue

that co-creation principally offers governments a tacit contractual language that has the capability to secure political legitimacy and administrative and situational room for manoeuvre in the emerging future. We assert that in the design and execution of co-creation in spatial governance (1) the extent of people's consent to decisions to be made in the emerging future, and (2) the extent and way in which participants' knowledge is productively contributing to shaping the future-in-the-making are not reflected upon and commonly taken-for-granted. We conclude that participation in strategic policymaking and planning practice bears more resemblance to recruitment campaigns by governments than to a true co-creation process. We therefore advocate for more critical and reiterative reflection in governance on the tacit features and subsequent recognition on how these affect the anticipation of the future as a collective co-creative journey.

13:00-14:30
Techniques Workshop: Going meta, anticipating anticipation: a workshop
Noorah Alhasan, Joseph Corneli, Charles Danoff, Abby Tabor and Leo Vivier

Together with workshop participants, we will co-develop a Design Pattern Language for envisioning, exploring, and enacting the future.

Thematic Questions
"What creative, artistic, design-based and avant-garde approaches are in play?"

"How do community and organizational infrastructures promote futures thinking and anticipatory capacity building?"

In a previous pilot, described below, we employed game-based approaches, drawing on a melange of methods and resources. This workshop design is mirrored by a strategy that distributed teams can use to scaffold social perception, cognition and action (Corneli et al., 2021). Applications range from running further workshops, to building new platforms for collaborative design and citizen science, to assisting on-the-ground innovation projects. Anticipation 2022 offers a unique opportunity to expand upon this scaffolding by building a shared catalogue of anticipatory methods. To facilitate engagement, we have streamlined our earlier interactive game to recenter on Design Pattern Language methods. This will help participants be clear which problems they are solving in the workshop setting, and will provide a clear and unified basis for creative, critical, reflection.

Background

In the Minnesota 2050 project, participants were selected from a variety of professions and leadership roles to produce scenarios for local energy and land use, and combined modelling with scenario planning (Olabisi et al., 2010). Addressing the world's largest problems requires both new ways to bridge between the viewpoints and skillsets of, e.g., professional futurists, programmers, data scientists, local farmers—and to draw on the insights of citizen scientists (Wildschut, 2017). To engage with this complexity, we have proposed to use and develop a collection of ("virtual" in the sense of Deleuze/Bergson) patterns of patterns that work fluently across domains, levels, and spheres of endeavour (Corneli et al., 2021).

Piloting

On October 6th, 2021, we led an online workshop called "Flaws of the Cool City" at the 2021 Pattern Languages of Programming (PLoP) conference. This was an adaptation of previous workshops offered last year at the Brookes Creative Industry Festival on May 20th and the Connected Learning Summit on July 23rd. Following a short presentation, we trained each attendees on one of four roles—that of Historian, Kaiju Communicator, Designer and Analyst—and invited them into a serious (but fun!) role-playing game. The game was a remix of other preexisting materials and methods, some of which we first encountered at Anticipation 2019.

• Scenarios from the Causal Layered Analysis (CLA) game developed by Heinonen, Minkkinen, Karjalainen, and Inayatullah for the "Future Studies Tackling Wicked Problems" 2015 conference in Turku, Finland;

• Roles inspired by the "Flaws of the Smart City" game created by Design Friction in Paris; and,

• Actions drawn from the "Cooling the Commons" design patterns from Tonkinwise and Lopes at University of Technology Sydney.

At the end of the most recent pilot, we did a Project Action Review (PAR) together with workshop participants (the method is described in Corneli et al. (2021); relevant data was archived on Google Docs). In the next section we outline specific details of our plan for Anticipation 2022 with a Pre-PAR that reflects on and responds to feedback on the pilot.

Adaptation of the "Flaws of the Cool City" Pilot
#1. Review the intention: what do we expect to learn or make together? Creating an anticipatory pattern language together is likely to be interesting to workshop participants.
#2. Establish what is happening: what and how are we learning? Distilling our previous pilot down to a set of patterns will partici-

pants reflect, by providing a uniform template for structured engagement.

#3. What are some different perspectives on what's happening? We will encourage participants to describe and share their own ways of working (e.g., Social Presencing Theatre from Van Rhyn et al., 2019) in pattern form. Depending on the number of attendees, we will use appropriate methods for distributing work and "scaling up" (e.g., open space, pairing).

#4. What did we learn or change? Adapting our previous materials into patterns will provide a unified, well-integrated, way of collaborating in the 90-minute session.

#5. What else should we change going forward? A unified pattern-based approach will make the workshop a useful data-gathering activity to feed into an agent-based modelling approach we are developing separately, drawing on concepts from the life sciences (Cf. "Expecting Ourselves: Embodied Prediction and the Construction of Conscious Experience" at https://www.x-spect.org).

13:00-14:30
Curated Session: Towards Ethical Anticipations of Educational Futures
Noah Sobe and Keri Facer

This session aims to foreground the varied, sundry, and possibly even emancipatory ways that anticipatory thinking enters into educational thinking, policy and practice. It directs attention at the 2021 UNESCO Futures of Education report Reimagining our futures together: A new social contract for education in an effort to advance the ethical dimensions of thinking about and working with ideas of the future in education. The first part of the session will feature a presentation by Keri Facer (University of Bristol UK) whose paper

"Futures in education: Towards an ethical practice" served as one of the background papers commissioned for the initiative. This will be followed by a presentation on the report itself by Noah W. Sobe (Loyola University Chicago USA) who previously worked in the UNESCO Secretariat to the International Commission on the Futures of Education. Then the remainder of the session will be dedicated to a conversation led off by the invited discussants and to include the audience.

13:00-14:30
Curated Session: Making Critical Futures
Laura Forlano, Jessica Meharry, Hendriana Werdhaningsih, Irem Tekogul and Catherine Wieczorek

In this session, we aim to examine the work of "making critical futures" – as a politics, as a series of questions, as a practice, as an embodied experience – based on a wide range of cases from studies of corporate foresight to participatory futuring [1] around topics such as health, work, craft and culture. Rather than universal, objective futures from nowhere that are continually advanced and promoted in the futures field as well as in Silicon Valley proclamations, our interactive conversation locates futures that are emergent from our own identities, desires and visions for social change. We refuse the apolitical discourse around futures as a blank slate [2] and, instead, infuse futures with a commitment to care and healing of our relationships to ourselves and our communities. Our futures are first-person [3], somatic [4, 5] and embodied [6].

There are many active communities engaged in the use of inventive methods [7, 8] including design fiction [9], speculative design [10],

speculative and/or anticipatory ethnography [11], experiential futures [12], critical fabulations [13] and speculative civics [14]. Yet, many of these critical and anticipatory design methods have been criticized for their elitism and lack of engagement with the public. Beginning with reflections on our own positionality, we work towards a speculative praxis [15] that reunites critical theories with design futuring methods that support participation and intervention in order to destabilize [16] existing socio-technical imaginaries [17] and narratives. Across a range of field sites, we ask "who gets to future?"[18] and, in addition, where, why and how do we future?

15:00-15:45
Keynote | Deji Bryce Olukotun
Do we want a cyberpunk future?

Science fiction has wrestled with new economic visions for some time. While some tales offer a future unfettered by capitalism (for example where social status replaces coinage), other stories consider cyberpunk worlds dominated by a singular corporation. These stories reflect the world we live in. But times are changing. Around the world, people are going head-to-head with dominant companies that have reached trillion dollar valuations and amassed unprecedented power. Are we headed towards cyberpunk? Not if we can imagine futures in which healthy competition reigns, and winner-take-all is not the dominant paradigm. This keynote will challenge us to imagine new visions for science fiction and the societies we want to inhabit.

16:00-17:30
Independent Paper Session: Mediated Temporalities

Exhibition Design of the Sami Pavilion through 3d-Scanning and Multiplayer Virtual Reality

Kai Reaver

The case study documents an open, research-oriented design process during the Covid-19 pandemic for the Nordic Pavilion (retitled the Sami Pavilion) at the 2022 International Biennale of Art in Venice. We base the case study on earlier research demonstrating the ability to use 3d-scanning and game engines to create 1:1 models of architectural heritage sites in VR [1], and the use of such data in performing user research and collaborative design among user groups not normally involved in the design process [2]. We expand on this research by looking at ways to facilitate an international, multiplayer design process inside of a virtual model. Various setups are tested by the design team with cutting edge technology in the alpha / beta phase before involving curators and artists. Artworks and positions of artworks are tested in various configurations within the model in order to simulate the spatial experience of the space. The model is then used to generate documentation and installation instructions, which are installed. We then perform studies to check the relationship between the digital VR model and the finished result. We conclude with reflections on how mixed reality can help facilitate multiplayer design across borders, levels of expertise, and design cultures, while elaborating on what the data may tell us about the relationship between spatial experience in digital and physical space.

Digitizing in the face of catastrophe – speeding up to slow down

Roos Hopman

At the present moment, natural history museums worldwide are in the process of digitizing their collections of millions of objects (such as insects, minerals, herbaria), for example by taking high definition photographs of specimens. Making historical collections of natural objects available in an online infrastructure is presented as essential to understanding the state of biodiversity in the past, and by comparing that to the present, to identifying changes in biodiversity over the past two hundred years. By digitizing large numbers of natural history specimens, museums are stressing we can furthermore gain insights into possible futures, as these collections are taken as unique resources for answering to oncoming challenges posed by the effects of climate change.

In the discourse around specimen digitization, acceleration and speed come forward as central notions. On the one hand, the world is said to face the "rapid" decline of biological diversity, with biodiversity being lost at "accelerating rates". This loss is presented as an ongoing emergency that is gaining momentum, that must be "slowed down". In order to slow it down, to keep climatic catastrophe at bay, digitization efforts need to speed up, or so we are told. With the industrialized digitization of objects, researchers and museum directors hope that knowledge on changes in biodiversity will grow, offering 'solutions' to our catastrophic times. At the Museum of Natural History (MfN) in Berlin, directors have tried to answer to this need for speed by introducing the "Entomology Conveyor", a conveyor belt system that promises to scale up the digitization of insects.

Taking digitization projects at the MfN in Berlin as case studies, this paper takes issue with speed and its adjacent promise of digital infrastructure. Paying attention both to digitization with the Entomol-

ogy Conveyor, which is set up in a public exhibition, as well as digitization projects that remain hidden from the public view, it offers a comparison between digitization as spectacle and the more mundane labor of making digital. It does so in particular building on ethnographic fieldwork in the malacology collection. Thinking speed with snails, then, the paper investigates how this discourse of acceleration compares to digitization work on the ground. What is the promise of speed, and for whom? Who and what are necessary to produce and maintain speed? Seeing that digitization is furthermore presented as a means of mobilizing natural history collections towards preventing future catastrophe, it asks how imaginaries of (un)desirable futures are given shape in these divergent digitization practices.

Polylogue for the Co-creation of Images of the Futures
Maya Van Leemput

Over a decade ago Ziauddin Sardar welcomed his contemporaries into postnormal times, 'an in-between where old orthodoxies are dying, new ones have yet to be born, and very few things seem to make sense.' Postnormal times theory provides a diagnostic of our times and queries how anticipatory practices support orientation and navigation of a complex, contradictory and chaotic present. It spotlights the perils of old standards and approaches for responding to postnormal realities and underlines the indispensability of creativity, imagination, and ethics (or virtue) for navigating our postnormal time and building transnormal practices.

The literature draws attention to the vitality of polylogue(s) for mixing those ingredients together (Sardar, 2017, 2015, 2010; Montuori,

2017; Sardar & Sweeney, 2016). This paper traces the origins and various uses of the concept of polylogue over time and in different domains. It proposes an operationalisation of the model of polylogue for the co-creation of images of the futures as a contribution to the manifold existing efforts to understand, strengthen, build and multiply the capacity for collective anticipation -social foresight- throughout society.

In 'The Three Tomorrows of Postnormal Times' Ziauddin Sardar and John Sweeney (2016) formulated a response to the 'discourse of doing' question Sardar had put forward in 2010. Here we find an explicit call for polylogues of various scope and scale that constitutes an admittedly broad but nevertheless key proposition: "Polylogues require the creation of new physical and mental spaces where diversity, pluralism, and contending perspectives are present on their own terms but also deeply invested in engaging others in creating and sharing information and knowledge." (Sardar and Sweemey, 2016, p3) Where do we see, how do we understand, find and build such spaces and interactions?

So far, postnormal scholars and practitioners have modestly experimented, feeling our way into the idea and the practice of polylogue. For an irreducible concept like this, that is certainly appropriate and even required. In this manner we have reached a broad understanding of what a forward-looking polylogue might look like and have to offer. Now we can probe the meaning of polylogue further and begin to operationalise the concept more systematically.

The first section of this paper looks into the place of polylogue in postnormal times theory and its relation to Ziaudin Sardar's concept

of mutual assured diversity, also highlighting its uses in the framework of anticipatory activities. The next section is an exploratory overview of how the concept is situated and explained in different fields of inquiry. Then we look at how polylogue(s) take(s) place in practice, delving into concrete approaches for achieving the spaces and deep engagement that are required for fertile polylogue. The next section of the paper then focus on the operationalisation of the concept of polylogue and how this ideal type model is beginning to be implemented in practice for the co-creation of images of the futures, providing an introduction to the polylogue(s) in the experimental research and education project of the UNESCO Chair on Images of the Futures & Co-creation (Erasmus Brussels University of Applied Sciences and Arts, Belgium). The operationalisation pays attention to the scaled nature of polylogue and considers how media, art and design approaches already include and can underpin, inform and enrich this kind of inclusive and generative multi-vocality.

Picking up the threads on polylogue that run throughout postnormal literature -even when the term is not spelled out- and tracing the use of the concept elsewhere, this paper weaves various understandings of the concept into a yarn from which we can begin to implement a scaled and varied practice of polylogues for the co-creation of images of the futures in different contexts, spread across different domains and geographical locations and learn how such collective anticipatory practice may grow.

16:00-17:30
Independent Paper Session: Critical Technology Assessment

Failuring the Future: Critiquing Today for a Better Tomorrow

Jonathan Coopersmith

Incorporating failure analyses into the development and implementation of future-oriented proposals, policies, and goals should allow their creators to discover potential weak points, anticipate negative response, and consider what could go wrong. Unpleasant as the experience might be, the result will improve chances of realizing these futures. Large entities with resources already engage in scenarios, gaming, "murder boards," and other ways of anticipating future failure. After examining contemporary modes of failure analysis, this paper explores how to provide and promote "failuring" to future-oriented smaller groups, non-profits, and the public.

Model-based anticipation in technology assessment: the hermeneutic approach for opening up a critical perspective

Armin Grunwald

Anticipation needs capabilities for creating, analyzing and evaluating possible, probable, desired and undesired, plausible and feared futures. Model-based approaches have been developing to the favorite and widespread approach for integrating empirical data and scientific insight for providing knowledge-based pictures of the future. Model-based anticipatory reasoning has gained high influence on political decision-making as well as on public debate, e.g. in the Covid-19 pandemic, in discussions on climate change and for transforming the energy supply system. Models establish temporal relations in two directions: while they are (1) based on data of the past and knowledge of the present time, they are (2) used for creating anticipations orientating society's future, e.g. in scientific policy advice provided to parliaments and authorities by technology assessment

(TA). In the first relation, the models are models of something, e.g. of parts of the energy system or of the health insurance system in a country. Their epistemic quality can be scrutinized by familiar validation procedures and criteria, e.g. consistency and compatibility with data of the past. However, as soon as these models are used for creating anticipations, e.g. energy scenarios for a TA study, their status changes: then they serve as models for something, in particular for serving needs for orientation and decision-support. This shift involves a lot of premises and presuppositions, which often can be questioned and drawn into doubt. In particular, often there will be a continuity bias: the assumption that the system under consideration will not undergo larger change but will remain more or less stable. In this manner, model-based anticipation is, in a sense, conservative and shows tendencies to simply prolong the past to the future. While this problem already has been discussed with respect to data and causal relations included in models, I will extend the consideration to narratives included in models. Repeatedly it was stated (e.g. Roßmann 2020) that models, including mathematical and data based ones, are more than the representation of data composed according to empirically validated facts. There is no logical necessity or force to build a model based on a set of data and knowledge in a particular manner. Rather, there will be several alternatives for composing the ingredients into a consistent and coherent model – modellers nilly willy have to make choices how to organize the material. Facing this ambiguity, the function of narratives in composing the ingredients is to close gaps and to bridge heterogeneous inputs in order to create a coherent model. Consequently, the model-based anticipations are not only data- and knowledge-driven but also involve traces of the underlying narratives. These narratives may be shared among modelers' communities, may include elements of Zeitgeist, may be hidden or contested. By giving them a role in modeling, these narratives influence the resulting model-based anticipations as well as the conclu-

sions drawn for policy advice. Here, specific questions emerge, e.g. regarding models' and modelers' power for influencing decision-makers and shaping the future of society, regarding the transparency of the models and the 'philosophies' behind them, regarding the narratives behind the models and their consequences for creating pictures of the future. In its extreme form, even self-fulfilling prophecies could be created by narratives included in modeling. Therefore, in scrutinizing the role of models for anticipation and exploring their role for decision-makers, it becomes an urgent task to shed light on the role of narratives in general and on the specific narratives governing modeling in certain areas. In this paper, I will propose a model hermeneutics as a critical procedure operating on the borderline of data-oriented and model-based representation of parts of the real world (models of), of narratives underlying the processes of modeling, and of the anticipations created by extending the models to the future for providing orientation (models for). Seeking improved understanding as basis for sound criticism must, in accordance with an Augustinian view on futures, focus on the present ingredients and the processes of modeling. In line with the hermeneutical turn of technology assessment, this shift takes model-based futures as expressions of the present time into consideration.

State of the Art Pursuing this aim requires referring to temporal structures of modeling which opens up the door to applying a hermeneutic view on modeling which is subject to an ongoing project by the German Volkswagen Foundation (Erdbeer et al. 2022). Turning the perspective from regarding model-based futures as knowledge about times to come to considering them as contemporary objects to be studied, in particular with respect to inherent narratives, corresponds to the hermeneutic turn of TA (Grunwald 2019). From this perspective, model-based stories of the future are regarded

as characteristic expressions of the time in which they have been created, based on modeling techniques, assumptions and narratives, and data and other ingredients of that time. This perspective builds on research on narratives (Walton 2011, Roßmann 2020) and combines it with the hermeneutic view on anticipations.

The suggested topic addresses literacies for better understanding model-based anticipations and for gaining a critical perspective on model-biases as well. The paper aims at creating awareness among modelers with respect to narratives shared in their communities. Recent results demonstrate that such narratives are often included into models without critically reflecting them and without making them explicit. The hermeneutic approach is introduced as a means for shedding light on hidden narratives.

The Stupidest Thinking Machine In the Entire World: The Power of Narrative in Bad AI Futures
Robin Zebrowski

It has always been clear that various disciplines in AI draw on science fiction stories to help imagine and project what the future of the field might look like. In AI ethics in particular, this often starts (and ends) with Isaac Asimov and the Laws of Robotics. In the metaphysics and ontology of cognitive science, we often find just as much fiction bolstering our images of what the future holds in the quest for artificial minds. But the narratives that recur within these fields radically limit what we understand AI to be, and what we're really pursuing when we claim to be building AI. If AI theorists were to shift away from trying to implement Asimov's Laws of Robotics (for example), we might undertake a project that more fully captures what human-like minds and human-like ethics actually are. This paper draws on and expands a recent publication that offers the work of

Stanislaw Lem as an undervalued and underused model, in both AI ethics and AI metaphysics. I look at a number of important texts in AI, with a focus on AI ethics as a kind of case study (Lin, Abney, Bekey 2012; Lin, Jenkins, Abney 2017; Wallach and Allen 2009). I trace the usage of Asimov's recurrence across many of those texts, and analyze what that means for how we make sense of our future prospects. On the other side, I look to Polish science fiction author Stanislaw Lem to show us a better vision of what human-like AI actually means, and therefore what kind of future we're actually trying to bring about in our quest for that kind of artificial mind. I argue that Lem's robot stories in particular (many of which have long been translated into English) are an overlooked but valuable source of philosophical reflection on the nature of minds, cognition, and emotion, along with a more realistic picture of what truly human-like AI will look like. I take up Shannon Vallor (2016) and John Sullins's (2016) idea of artificial phronesis, and read it against Antonio Damasio's somatic marker hypothesis (1994) to demonstrate that in both ethics and ontology, humans are not rule-following machines as Asimov imagines, but more like habit-using instinct animals. With a focus on the robot stories from The Cyberiad (1974) and Mortal Engines (1977/1992) alongside evidence from both the philosophy and cognitive science of AI, I show how shifting our frame of reference away from something like Asimov's fiction to something like Lem's can help us first imagine, and then build, a more human centered, ethical, and scientifically accurate AI project.

16:00-17:30
New Ideas Session II

From Futures Thinking to Roots Thinking as a way to decolonize futures

Fernanda Ebert

From futures thinking to what I have been initially calling ROOTS-ESSENCE thinking, a process, methodolgy that aims to explore the system past and ancestry, aiming to inspire a sense of critical and creative thinking about its strengths and weaknesses, installing the kind of disobedience that allows us through the assessment of core, structural challenges, the co-creation with unheard, silenced voices, the effort to understand the system uniqueness and its real history, to unlock the birth of viable alternatives for decolonized world views. Changing the flows of knowledge on anticipation from the outside-inside to the inside-outside.

Inspired by indigenous concepts, Quilombolismo and others Global South epistemologies, especially the ones from Brazil-Pindorama territory where I was born and where I am located at this present moment. The main idea is that thinking about futures, futures as hope and hope as action in the now, should be more about the territory essence, roots, ancestry, values, signals and urgencies and less about collecting, reflecting and acting upon foreigners trends as a way to inspire real transformative future visions and change.

Future Studies as a Lens for Reckoning with the Past: Tensions and Possibilities in Renaming Debates
Jeanne Powers and Ruth Wylie

In this New Ideas presentation, we consider how a case of renaming public landmarks both reflects and engages assumptions about the past and future. In October 2021, the city of Tempe, Arizona began a process of renaming city parks and streets named after prominent

figures in the city's early history, after city employees discovered they were (allegedly) members of the Ku Klux Klan (KKK). City staff also informed the leaders of the elementary school district located within the city of their findings that three schools were named after possible KKK members. As a result, the school district's governing board initiated a separate process of renaming these schools. Both the city council and the school district's governing board are attempting to engage the community in their parallel processes of renaming these landmarks by holding public meetings and conducting surveys. In the initial meeting the Tempe city council held about renaming the landmarks, descendants of those who had up to this point been lauded as founding citizens of the community objected to the proposed name changes, while members of Indigenous communities from the lands that now make up Tempe described how their histories have been erased. Other community members have invoked additional racist policies and practices in the city's past, in service of arguments for and against renaming. The public debates about these landmarks raise important questions about equity, justice, how we memorialize and reckon with the past, and what vision the city and school district wish to project for future residents. We hope to use Anticipation 2022 as an opportunity to explore how these debates might be informed by concepts from the field of futures studies. How do we address present and past racial inequality, while also envisioning more equitable multiracial futures? Can a future-studies lens provide novel insights into this case, which more traditional social-science perspectives might miss?

"Eko? Isn't that what you people call Lagos?": Africanfuturism and Alternative Urban Futures in Nigeria
Luke Boyle

Africa's urban futures are being colonized by smart city imaginaries. These imaginaries, which are largely created to attract foreign capital and tourism through the development of "world-class" infrastructure and technology, illuminate the hegemonic power of corporate and high-modernist ideals and its influence on Africa's urban future. Many urban scholars have deconstructed these techno-utopian fantasies for being at odds with existing African cities, calling instead for urban visions that are embedded in place-based realities and preferences. Despite this, there is little in terms of concrete alternatives that challenge the smart city imaginary, leading some scholars to draw upon fictional framings of future cities to extend and deepen the critique of the smart city. In line with these sentiments the purpose of this research is to examine the role of Africanfuturism, an emergent sub-genre of speculative fiction that centers African people and narratives, to illustrate the limitations of dominant smart city imaginaries. In doing so, the study also hopes to illustrate how such fictional works can assist in the constructions of counterhegemonic imaginaries that offer alternative ways of knowing, living and being in future African cities. This will be carried out via an exploration of the Eko Atlantic project, a smart city imaginary that is presently materializing in Lagos; and Nnedi Okorafor's Lagoon, an Africanfuturism novel set in Lagos. Through this exploration, the study aims to examine what these two divergent imaginaries of Lagos can reveal about dominant socio-technical imaginaries that coalesce around the smart city, and how Africanfuturism can be deployed to support the formulation of alternative visions for African urban futures that subvert normative ideals regarding Western modernity and what the future African city should look like. Further, I argue that within the dominant traditional, cultural and historical elements that Africanfuturism showcase, lies the potential to develop genuine postcolonial future visions for African cities.

16:00-17:30

Curated Session: Democratizing the 'use-of-the-future' through Futures Literacy as a capability and competence

Lydia Garrido, Francisco José Mojica Sastoque, Tamara Carleton, Alfonso Ávila-Robinson, Fabio Rubio Scarano, Juan Carlos Mora Montero, Gonzalo Iparraguirre, Cecilia Palomo and Monica Mendez

Democratizing the 'use-of-the-future' through Futures Literacy as a capability and competence

This proposal for a curated session in the 'Anticipation Conference 22' intersects the themes 1. Public Futures and 4. Critical Anticipatory Capacities and will examine practices of the 'use-of-the-future' in society through Futures Literacy as a capability, particularly for the case of Latin American countries. This curated session is proposed by the Latin American Anticipation Network (RAAL for its acronym in Spanish), which involves a diverse group of researchers, practitioners and institutions working on futures and anticipation. RAAL is led by the UNESCO Chair in Socio-Cultural Anticipation and Resilience at the South American Institute for Resilience and Sustainability Studies (Uruguay) and embraces a handful of UNESCO Chair candidates in Futures Literacy, including Universidad del Externado (Colombia), Tecnológico de Monterrey (Mexico), and Museu do Amanhã (Brazil) among other institutions and colleagues in Latin America from the field of Anticipation and Futures Studies. This curated session aims to encourage an exchange of experiences and knowledge on more conscious, systematic, and effective practices of the 'use-of-the-future' in society. In particular, we would like to provide an inclusive, interdisciplinary space for discussions to rethink the practices and theoretical underpinnings of the foresight community into the 'use-of-the-future' as a potentially complementing anticipatory capacity for futures thinking in the present, as described in

Miller (2018). These discussions should enrich our understanding about the democratization of the 'use-of-the-future' through futures literacy capabilities. To this end, some crucial aspects to reflect in this curated session are: (i) The promotion of futures thinking, anticipatory, and foresight capacity building in 'use-of-the-future.' (ii) The ways for nurturing anticipatory capacities across society. (iii) The fostering of anticipatory leadership skills for the creation of transformational innovations in emerging country settings. (iv) Public policy design with focus on the 'use of the future'. (v) Building inter and transdisciplinary capacities for 'using the future'.

16:00-17:30
Techniques Workshop: Thinking with water: material co-production in anticipatory governance
Marisa Manheim and Christy Spackman

Disconnects between decision-makers' and community residents' viewpoints about sustainability transitions can be a critical barrier to implementation. In this workshop, participants will experience the material co-production methods we have developed to help water managers and socio-economically marginalized consumers make informed decisions about water supply options. These activities are inspired by approaches in urban planning, food studies, sustainability, and anticipatory governance that invite material, emotional and socially situated knowledge into policy-making. Significant time will be allowed for workshop participants to reflect on their experiences and discuss how the material co-production approach may be applied in their research and practice.

16:00-17:30

Independent Paper Session: Narrative Futures

The canoe: using fiction to embody the archetypes of the Anthropocene

Christine Roussat and Valentina Carbone

This paper is based on the intuition that a work of fiction (in this case, Odds for tomorrow, by Nathaniel Rich) can enrich the theoretical perspective on climate change in management sciences. We claim the relevance of apocalyptic fictions to decipher the reactions of different social groups to the events of the Anthropocene, and the modalities of collective action that result from them. Following the example of De Cock et al (2021), we argue that in order to face the challenges of climate change, it is necessary to shake up our thinking about future human and societal organization through the imaginary. Here we therefore confront, with the help of a qualitative coding methodology, the text of the post-apocalyptic fictional book with Hoffman and Devereaux-Jennings' (2018) Anthropocene archetypes. This ongoing research is based on an original methodology and produces creative writing; its results enrich the theory, reinforce its performativity, and call for an epistemological renewal.

Afrofuturism – Decolonizing Science-fiction for Alternative Modes of Anticipation

Isaac Joslin

Whereas science fiction is a literary genre generally attributed to the Western imagination as an expression of projected technological progress born of the Industrial Revolution, when the concept of "science" is divorced from its Western rationalist materialist underpinnings, certain fantastical elements in African literary expression lend

themselves to science fiction interpretations, both utopian and dystopian. Insofar as science fiction represents an imaginative escape from the limits of this world, whether it be on the moon, under the sea, or elsewhere within the imaginative universe, an Afrofuturist reading of select films, novels, short stories, plays, and poems reveals a similarly anticipatory African future that is firmly rooted in its pasts. As such, this paper identifies the contours and modalities of a futurist science fiction, rooted in the socio-cultural and geo-political context of African imaginaries. The theoretical construct of futurity, defined as the creative capacity to imagine and express a future, is therefore analyzed within the field of Francophone African literary expressions. This paper constructs an arc that begins with gender equality and cultural plurality as the bases for society and the role of education in affirming and perpetuating these values. This paper then traces the unofficial educative discourses of society, namely those of media representations and popular culture, as well as their ideological influence on populations, identifying critical mythologies that undermine social solidarity. The trajectory procedes with a critical analysis of globalization and the market-driven violence behind many intra-national conflicts, contrasted with an egalitarian, ecological, and equatorial ethos of communal engagement with, and respect for the diversity of the human and natural worlds.

This paper draws on critical Afrofuturist frameworks while also pushing the discursive boundaries of the field to more inclusive and broader cultural contexts, namely those of continental African fictions written in French. Prominent Africanist scholars, including Achille Mbembe, Felwine Sarr, and Handel Kashope Wright, have advocated and argued for new frameworks through which development in Africa could be conceptualized differently by appealing to indigenous forms of knowledge, societal organization, and cultural

values. Consequently, this paper examines viable alternatives for endogenous development through the theoretical lens of Afrofuturism, a contemporary social aesthetic that combines cultural literacy with ecology and technology to imagine an inclusive and innovative future through deliberate and intentional study of literature and the arts as vehicles of socially responsible and culturally sensitive commentary in contemporary African cultural and developmental discourses. By exploring the realms of societal possibilities through creative expression that incorporates ancient African mythologies, cosmologies, and traditions while also adapting the technical and artistic elements of global modernity, this paper contributes to the concept of anticipation from a decolonial perspective, exploring indigenous knowledge systems and alternative imaginaries for conceiving human futures.

Subjunctivity, A New Form of Knowledge: On the Epistemology of Possibility
David Staley

This presentation identifies a new category of knowledge: subjunctivity. If science is defined as the systematic study of the structure and behavior of the physical and natural world—that is, the systematic study of reality—then subjunctivity is the systematic study of what the philosopher Nicholas Rescher has called "irreality." The subjunctive refers to a mood of verbs that express what is imagined or wished or possible. Subjunctivity, then, takes as its domain of inquiry the conceptual space of the possible, and is an approach to knowledge that studies the ontologically inactual. The imagination becomes the cognitive means by which we apprehend the subjunctive domain. Foresight, anticipation and futures studies are all disciplines that would be categorized under subjunctivity. This presenta-

tion will advocate for a reorganization of the university into two "hemispheres" of knowledge: those disciplines that study the realm of the actual and those that study the realm of the inactual, that of subjunctivity.

The domain of the subjunctive is a vast terrain: it includes counterfactual history, idealized design, fiction (what is the ontological status of fictional characters?) and, especially, futures/foresight/visioning/anticipation. There is a strain of Buddhist philosophy that considers nonexistent objects, "knowing what there is not." Chiara Marletto observes that "in the prevailing scientific worldview, counterfactual properties of physical systems are unfairly regarded as second-class citizens, or even excluded altogether." Lubomir Dolezel writes that "Our actual world is surrounded by an infinity of other possible worlds." According to psychiatrist Arnold H. Modell, "our minds have the ability to create 'a second universe'—an internal environment of possibilities that exists concurrently with the stubborn physical world."

The subjunctive hemisphere of the university gathers together counterfactual historians and physicists, fiction writers and Buddhist philosophers, futurists and visionaries. It also incubates new disciplines that study the inactual. It is an epistemological organization of all those who seriously investigate the "second universe," what we might term the "second university."

TEMPE, ARIZONA, NOVEMBER 18

4TH INTERNATIONAL CONFERENCE ON ANTICIPATION TEMPE, ARIZONA

NOVEMBER 18, 2022

09:00-09:45
Keynote | *Laura Forlano*
Crip Futurity, Cyborg Disability and Designing the World Otherwise
We are constantly told that there is a crisis of the imagination, that we need solutions to problems, that critique is not enough. Yet, alternative ideas about the future are all around us – in art, in activism, in everyday life. In this presentation I will ask the question: how might the world be different if we understood both ourselves and our technologies to be disabled? Drawing on my own experience as a Disabled Cyborg, documented through a decade of autoethnographic observation about Type 1 diabetes, my "smart" insulin pump and sensor system, I discuss what it means to live with automation through themes of agency, labor and failure. Through examples from disability activism, art and design, I illustrate the ways in which disabled people might participate more actively in framing and shaping alternative possible futures for living well with each other and with machines. These art and design examples challenge dominant sociotechnical imaginaries around AI, data and machines thereby asking how the world might be otherwise.

10:00-11:30
Independent Paper Session: Design Futures

Anticipatory justice in design speculation
G. Mauricio Mejía

All design practices have a future orientation. While designers are not intentionally causing harms, design artifacts are regularly reproducers of social injustices in the future. This paper questions how futures methods could support design for justice. Anticipation of the future is a process of identifying probable and plausible futures to inform decisions in the present. On the other hand, design speculation is an imaginative process to generate and make preferable futures. Designers can use anticipation, specifically, in the evaluation of design proposals, which would help their efforts to make just futures. Ethical designers speculate preferable futures, assume a political posture, anticipate plausible harms, and improve their proposals for justice.

The Critical Catalyst: Demystifying Critical Design Futures
Ammer Harb and Manuela Celi

With the increasing ubiquity of socio-technological developments, future challenges and technological implications have become even more unpredictable and uncertain. To challenge this uncertainty, design - bearing its disciplinary responsibility toward sustainable futures - has proposed alternative directions that explore the borders of future challenges.

Over the past three decades, researchers and practitioners have developed design directions that aim to operate outside market-driven inquiry to question and interrogate design futures. These practices' purpose and motivation are to mitigate the implications of unfavourable consequences that might affect the future. They act as problem finders rather than problem solvers (Mazé & Redström, 2007). To provide representative examples, these practices include Speculative Design (Dunne & Raby, 2013), Design Fiction (Sterling, 2005), and Experiential Futures (Candy, 2010). In this paper, we refer to these practices as Critical Design Futures.

We define this set of practices as Critical Design Futures (CDF). This notion describes a set of constructive design research practices aiming at exploring design disciplinary borders and limitations. They create a framework for critiquing and revisiting our uptake of technology, politics, and public engagement. They work as a reflexive practice that aims at positioning design as an act that produces affirmative design outcomes and as a responsible practice that aims to enact constructive social change. It's an actionable set of practices that aim to trigger and initiate debates about the future.

CDF diversifies the ways we look at design issues and boundaries, it does not explain, clean or sterile the debate, but rather it problematizes and accentuates future issues. It acknowledges that design is a futures-oriented activity; its role is to rethink the actions we take today. CDF anticipates the future and disrupts how a designer looks at it. It unsettles the way designers and the public think about the future and brings alternative proposals to the public's assumptions to the table. CDF opposes conflicts and takes a resistant stance towards conventions, hegemonies, and go-with-the-flow design decisions.

Although sounding very profound, and examples are abundant, the theoretical academic literature on the CDF practices is still not fully comprehensive in terms of theory, relation with other design practices and enquiries about the method, making and development are still unresolved. (Bardzell et al., 2012; Mazé & Redström, 2007; Ozkaramanli & Desmet, 2016; Pierce, 2021)

In this paper, we propose The Critical Catalyst (CC), a set of reflexive design activities and devices developed to fill the gap in the methodological approach of Critical Design Futures. The CC works as the initiator of critical debates in design futures and a catalyst to facilitate designers' reflections on future challenges. Its aim is to a) facilitate triggering critical enactments in design futures practices, b) work as a self-reflexive tool for practitioners and researchers c) facilitate critical design decisions along the process.

The CC is structured as several critical paths as follows:
- first layer or the paradigms: they act as guiding paths to adopt along the process,
- second layer or the motivations: where designers identify their aims and approaches in addressing futures challenges through design,
- third layer or the critical narrative approach (scenarios): where it is possible to develop both structure and critical lenses that can be used in a critical design futures proposal (for diegetic scenarios or world-building).

This context allows the designer to connect the gap between material and immaterial, turning scenarios into visceral and tangible design output by defining specific critical design propositions and design-

ing critical objects. This CC climax opens up the discussion and proposes the concept of critical pragmatics in design for futures context.

On the methodological side, this research is developed by analyzing speculative and critical design projects as secondary resources. Case studies aim to identify and develop themes and paradigms at which a vital futures project can take place. We inquired designers' uptake and motivations through analysing the artefacts, videos, and projects' documentation. A literature review has been conducted to support this research and to further the insights as well as grounding the secondary research findings (Candy & Dunagan, 2017; DiSalvo, 2012; Dunne & Seago, 1999; Lindley et al., 2018; Malpass, 2017; Mitrović et al., 2021; Pierce, 2021; Sengers et al., 2005; Tharp & Tharp, 2013). The second layer of research is the expert interviews, design experiments, and testing in the design pedagogical context for the master's students of Integrated Product Design at the Design School in Politecnico di Milano. These activities were conducted to further test the applicability of the CC, and to define the problematic and weak areas that need development. The CC has gone through 3 rounds of modifications and development. This research was conducted as a part of a PhD research at the University of Politecnico di Milano and supported by "FUEL4Design: Future education and Literacy for Designers"; An ERASMUS + co-funded project.

To conclude, in this paper we discuss three questions and propose a non-prescriptive answer through the critical catalyst. 1) What does it mean to be critical in design futures? 2) Why would you be critical about design futures? And 3) how this can be achieved from performative and conceptual levels? The research investigates a precise area of the future-oriented design inquiry placing the capacity to activate critical thinking along the process as an intrinsic value. To say

it with Carrol "designers are not just making things, they are making sense" (Carroll, 2000).

The Future as Service
Eva Knutz and Thomas Markussen

This paper explores how spaces for public anticipation can be designed from a service design perspective using speculative participatory practices of materializing anticipatory thinking.
Through a dialectic analysis of the materials and models used in a series of workshops held with design students in London and Milan, we examine the literary, societal and co-creative aspects of crafting the speculation. We offer a refined method of how to practice Design Fiction from a societal perspective integrating literary practice with design practice.

10:00-11:30
Independent Paper Session: Creativity, Innovation & New Media

Beyond the Studio: how Cross-Modal Third-Space Thinking might reshape education
Samantha Perkins and Paola Sanguinetti

The design studio—a space where students and faculty work together in a highly collaborative relationship—informs professional workplaces, providing a playground model for productivity where all participants could explore innovative solutions. The studio has been touted as a place in which faculty are mentors and students are future design leaders—equals by most measures. Yet, despite aspiring to this great vision, issues such as inequality and a disregard for

wellbeing are being challenged within this experience. As the pandemic removed students and faculty from the standard studio environment, issues of inequality and wellness that had previously been ignored came to the forefront. Diverse voices had not been and were not included in the conversations, even within this new realm, leaving many students isolated and unheard. This feeling of isolation is even more evident in the online student experience, as cohorts do not have a standard studio learning space, and are thus left with asynchronous messages to questions or comments, and disembodied faculty feedback to guide their education. This paper explores how the studio concept has informed our world, and how reconsidering its structure using Cross-Modal Third Spaces can build a better and more inclusive learning community that meets social needs through engagement of campus-based and remote/online student engagement.

"Like something's about to happen": speculative anticipation from unknown sounds
Richard Sandford

This paper describes a method for helping young people to think speculatively, a method that is itself a speculative experiment. As part of a wider project exploring young people's ideas of the future and educational choices, young people worked with unknown sounds, presented without contextualising information, to create narratives of possible events, producing speculative vignettes from an improvised soundtrack. Participants imagined fallen robots, playful soldiers, midnight chases in underground stations, and bubble bath drums: they imagined affective futures that were uncanny and absent, calm and safe. These speculations were not, I suggest here, the product of moments of insight or inspiration. Instead, the specu-

lations produced through this experiment began with the cultural resources young people brought with them.

Why is it important to understand how young people might think speculatively? Young people's ideas of the future matter. Within education, young people's ideas of the future play an important role in the educational choices they make: education researchers have described the ways in which young people's aspirations and imagined possibilities shape the choices they do, and do not, make (e.g. Zipin et al., 2013). For many, the ideas of the future that young people draw on in making choices arise within the habitus (Bourdieu, 1990), the set of dispositions that experience has shown fit within a particular field, and which produce ready-to-hand ideas of what comes next. Others (e.g. Walther et al., 2015) draw attention to the considered ideas of the future that arise through the kind of reflexive thought described by Archer (2007).

But other, more speculative forms of future ideas are also part of young people's thinking. Recent work has attended to the role of hope in young people's agency (Ojala, 2017; Cook, 2016), and a few researchers (such as Carabelli & Lyon, 2016) have begun to pay attention directly to young people's speculative thinking. The method described here aims to contribute to this growing interest in recognising and understanding such thinking, in order to support a fuller understanding of the role played by ideas of the future within young people's educational decision-making.

What is meant here by speculative thinking? This method draws on work (e.g. Savransky, 2017; Parisi, 2012) building on ideas from pragmatist and process philosophy to suggest that speculation involves going beyond the frames and categories that are prior to our understanding the world. Some futures cannot be produced by extrapolating or projecting forwards using the terms of the present. Specula-

tion is what takes place when these terms are overreached and exceeded, when the ways in which the world is usually understood are not equal to the present setting, and experimentation is demanded. At such times, the possibility immanent in the unfinished moment becomes evident. Speculative ideas arise precisely when dispositions and reflexivity are insufficient - when common sense or rational ideas about the future are no guide to action.

Within this project, I positioned speculative thinking as one strategy available to young people in the "times of crisis" (Bourdieu & Wacquant, 1992, p. 131) arising when there is a gap between their dispositional expectations and present reality. The response imagined by both Bourdieu and Archer to such a discontinuity is a turn to reflexive thinking. But I am suggesting that there may be times when reflexive reasoning is, like dispositional thinking, not adequate to the situation, perhaps when the taken-for-granted categories or structures that we use to reason with no longer obtain. In such uncertain circumstances, what may be needed is speculation.

The aim of the method described in this paper was to engineer just such a discontinuity, on a small scale: to produce, for young people, a moment in which neither dispositional nor reflexive thinking were capable of supplying what was needed. In engineering such a moment so deliberately, in search of something so unlikely to leave a trace in the world, this method might be understood as inventive (Lury and Wakeford, 2012), or as a 'lure', in the sense that Savransky et al. (2017) and Parisi (2012) borrow from Whitehead to describe attempts to bring the 'not-yet' into the realm of the empirical. This paper suggests that, for researchers and futures practitioners exploring the production of speculative futures, such inventive approaches are necessary, and argues for greater engagement within futures literacy and anticipatory practice with this methodological approach.

Creativity: The Flawed Forge of Tomorrows
Christopher Jones

Creativity and innovation are a mixed blessing, on one hand, they have been the engine of scientific progress and technological development, while on the other hand, they have produced a global civilization that is killing its host planet. Creativity and innovation will also need to be a part of the solution to the unfolding planetary environmental catastrophe. This paper explores creativity in the context of postnormal times and its connections with futures studies, provides an overview of its use in futures studies and anticipation. The purpose of this paper is to better understand the possible futures of creativity within the context of a closed planetary system, historical use and application of creativity with futures studies, the role of creativity in helping generate postnormal conditions, emerging critique and dark side of creativity and innovation.

Postnormal times analysis is a conceptual framework, more than a theoretical lens, however it has evolved as an analytical and conceptual set of tools to better understand change in the 21st Century. It is informed by some traditional schools of critical thought. To understand the futures of creativity, I will use postnormal times (PNT) analysis (Sardar 2010; Sardar 2015) that considers the complexity, chaos, and contradictions of social and technological systems, complicated by the extent to which our species has now exceeded the planetary system boundaries. Lovelock (2006 2015), Lenton and Latour (2018), and Slaughter (2010) make the case that humans have not only passed the earth's carrying capacity, but we have also fundamentally violated or exceeded the earth's planetary boundaries and interfered with key regulatory systems (e.g., climate, ocean chemistry, thermal equilibrium). Creativity is both a source of growing complexity, but also a response to it.

The knowledge base on creativity is large, and the research and writing about creativity and innovation in futures studies is also extensive. The origins and importance of creativity, invention, and imagination play this aspect of human experience at the apex/core of our evolution as a species (Morris 2016). There is extensive literature on the creative content industries (Landry 2012), creativity studies (Segal 2001), and other psychological, spiritual, and cognitive contexts (Montuori 1990; Lehrer 2012). Creativity is both a driver and a consequence of change, a result of turbulence and chaos (Schultz 2006), producing individual change and social change—an iterative cycle following McLuhan where we create our tools, organizations, and myths, and then they recreate us. That may be our devil's bargain, even if we conclude that discovery and creativity are not immoral as they are portrayed in some science fiction. Critiques of creativity exist (James et al. 1999) but are rare. There is a growing body of work on negative creativity and deviant imagination (James et al. 1999; Janssen et al. 2004), but it is mostly buried in psychology and creativity studies journals.

Futures studies and foresight have developed using creativity as a focus and as a process. Some of the creative roots of futures studies extend far back into history, including the fiction of Verne, Wells, and utopian literature (Lombardo 2018). WWII rockets and radar, and the dawn of the nuclear era the RAND Corporation and think tanks to anticipate weapons systems with 20-year life cycles. Postcolonial futures projects anticipated power and culture shifts from the West to the Rest. Feminist and critical futures blossomed.

Even the most perverse and morally objectionable examples of creativity have shifted the creative boundaries in anticipating our futures. Futurist and nuclear strategist Herman Kahn asked planners

and decision-makers to "think the unthinkable" in anticipating thermonuclear war. Given the proliferation of existential threats sixty years later, we arguably need to be even more creative and anticipating black swan events and threats to civilization, particularly global weirding (Friedman 2010; Jones 2019; Sweeney 2017). Creativity is not only reflected in the development of futures tools and techniques, but also owes some credit to futures studies for contributing to creativity studies (Bishop & Hines 2012). Creativity is evident in the techniques of futures—that deliberately challenge participants to be creative and to "think outside the box." Creativity has been seen as essential in scenario building and development and visioning. Creativity is also seen as a key element in the task of identifying weak signals in horizon scanning (Heinonen & Hiltunen 2011), as an essential strategic foresight tool (Godet 2001; El Kerdini & Hooge 2013), and in foresight in technical and engineering education (Thayer 2014; Woodgate 2018). Even the worst outcomes of research and development are countered with creative approaches to mitigate or prevent unanticipated consequences, such as the work of the US Congressional Office of Technology Assessment in the 1970s (Coates 2010). However, creative genie is out of the bottle and is now enormously disruptive, as illustrated by the proliferation of conspiracy theories such as QAnon that have influenced the decision-making and votes of tens of millions of people. Nuclear weapons proliferation and evermore creative ways to make and use the devices (Bousquet & Grove 2020) tug at the moral fabric of the exercise of military power. As top predator, we not only possess the ability to exterminate vast numbers of other species (Kolbert 2014), but our own as well (Ord 2020). Creativity is not the cause perhaps, but is it the effect?

10:00-11:30

Techniques Workshop: Prototyping Social Forms Workshop 1 – Enacting and Sensing Process

Muindi F. Muindi, Xin Wei Sha, Nadia Chaney, Teoma Naccarato, John MacCallum, Garrett Laroy Johnson and Dulmini Perera

Part of the Prototyping Social Forms "Un altro mondo è possibile" Stream

"Detourning" the notion of anticipation, we offer a workshop on enacting alternatives to what is the case. Supplementing techniques for extrapolating from the present to the future, the interdisciplinary and international collective Prototyping Social Forms (PSF) develops platforms, tactics, and technologies to make locally generated knowledge transportable and transformable, forming such knowledge into "germs" that can "sprout" in disparate learning and research environments.

This 90 minute Techniques Workshop focuses on experiential experiments on rhythm and joint intention ranging from analog to wearable hybrid cyber-physical musical instrument, and different kinds of time-sense.

Germ #1 - Rhythm: We conduct a sequence of rhythm games that can be played in a hybrid setting with participants in both zoom and in live space: breathing, countups, comings-and-goings, foraging rhythm, …. These etudes are one step toward a multi-scale and multi-valent sensing of the dynamics of hyper-complex biosocial phenomena, like cities or languages. Duration 45 mins: three rounds of progressively more elaborate rhythm games, physical room ǀ outdoors + streaming videoconference or good cell reception. (Rhythmanalysis, Lighting and rhythm).

Germ #2 - Time Zone: Interrupted Reading and the Voice of Time: Attending to "unbidden" thoughts and images while reading aloud together, without eschewing intellectual or critical reflections. As conscious and unconscious (or explicit and tacit?) reflections bloom into the group space, the reading time thickens and a new voice can be heard; neither author nor readers, a surplus vocality. We call this the voice of time. Participants then listen together to this voice of time and record it together as a response to the interrupted reading.

10:00-11:30
Techniques Workshop: Learning Anticipatory Thinking
Ray Quay and Claire Lauer

In a highly uncertain environment, anticipatory thinking is an approach to strategically guide adaptive problem solving. Though anticipation is hard wired into human thinking at a subconscious level, using it to actively guide problem solving, particularly problems and decisions with long term implications, is a skill that is best learned. Yet the skill of anticipatory thinking is not a focus of our educational system. This Techniques Workshop will discuss methods of teaching anticipatory thinking using web based interactive models. The Decision Center for a Desert City at ASU has developed a web based interactive model, WaterSim. that is being used to introduce secondary and university students to exploratory scenario analysis to anticipate the future of water sustainability. This workshop will include a review of research and concepts used in the design of current and future versions, the curriculum used in the classroom, and assessments of it utilization. This will be a hands on workshop with participants conducting an exercise using the tool and then having a discussion about the strengths and weaknesses of this approach.

10:00-11:30

Curated Session: Stacking the Deck for Sustainability: Youth "Lessons" to Turn it Around

Ann Nielsen, Esther Pretti, Marina Basu, Dilraba Anayatova, Setrag Hovsepian and Iveta Silova

Addressing the climate crisis is a complex, multifaceted effort that requires collaboration across academic disciplines, national borders, and political interests. This curated session focuses on a global climate initiative, called Turn It Around! (TiA!) which engaged youth artists and activists to radically (re)envision and (re)articulate the role of education in anticipation of more sustainable and ecologically just futures. Mobilizing the power of socially engaged art to move people into action, this project was designed to 'move' politicians, policymakers, and educators into a different state of thinking, doing, and being. At the center of the initiative is one of the most basic learning tools – a deck of flashcards – designed by youth for decision-makers at all levels to challenge them to think, see, and act in new ways. In this session, we will begin with an introduction of the initiative, an overview of three papers that describe the ontological, methodological and pedagogical 'turns' for education that were activated through this participatory climate art initiative, and conclude with an opportunity for participants to engage with the "Turn it Around!" flashcards.

10:00-11:30

Curated Session: How can governance capacities support transformative pathways toward nature-based futures?

Amanda Kuhn, Nancy Grimm, David Iwaniec, Niki Frantzeskaki, Robert Lloyd, Marta Berbés-Blázquez, Liliana Caughman and Tischa Muñoz-Erickson

To foster transformative change toward sustainability goals, a major priority of urban change agendas worldwide is the realization of future visions which feature nature-based solutions (NBS). Academic scholars have developed frameworks for describing the capacities which support transformative urban change but few studies characterize how urban NBS researchers and practitioners operationalize these frameworks to proactively build the capacities necessary to navigate change toward normative sustainability goals. What are the pathways that enable or constrain the realization of positive, nature-based futures? The NATURA network's 'Nature-based Pathways Working Group' is addressing this question by analyzing the role of transformative governance capacities in enabling pathways toward nature-based transformations. We use the transformative governance capacities framework developed by Hölscher et al. (2019) to identify how governance actors and activities have enabled the emergence of system-level conditions that support capacities for nature-based, transformative change. We have created a visual storytelling process to interactively map respondents' case study narratives and visualize their project pathways through time, according to the transformative capacities supported. At Anticipation, we propose a curated session to present our case study database, pathway visualizations, and begin a discussion on how comparative pathways evaluations can support future anticipatory action. Session participants will leave with a greater understanding of how NBS practitioners in international contexts interpret the pathways to transformative change. Participants will also be invited to engage in ongoing collaboration with this work through the NATURA network.

12:30-14:00
Independent Paper Session: Climate Imaginaries

Effects and Effectiveness of Climate Imaginaries
Manjana Milkoreit

Political processes of creating and contesting shared imaginations of climate futures are of growing importance in the 'decade that matters' for climate action and biodiversity conservation. Recent scholarship on climate and sustainability imaginaries has distinguished between the content or substance of imaginaries, i.e., the kinds of ideas about future societies that are shared, favored and fostered by different actors, and techniques of futuring – processes that generate shared future visions in specific groups or publics. There has also been a growing emphasis on the political nature of collectively imagining futures. While the relevance of imagination as a public good is undisputed in sustainability scholarship, little is known about the causal effects and comparative effectiveness of different attempts to engage in collective futuring. Here, I address the question of imaginary effects: What kinds of causal work do imaginaries do, what are different ways to understand effectiveness, and what renders one imaginary more effective than others? Drawing on a literature review of the concept of effectiveness (e.g., of institutions, frames, or actions) across multiple disciplines, I distinguish five sets of factors that influence the causal potential of climate imaginaries: (1) imaginary content, (2) audiences (3) processes of collective futuring, (4) politics, and (5) historical context. Describing and relating these dimensions to each other, I develop a framework for studying the effectiveness of political imagination. This framework enables the development of specific measurement approaches related to the effectiveness of imaginaries and could enable future empirical work. I illustrate this potential of the framework with a proposed measuring approach and related empirical guidance.

On Regenerative Anticipation

Fabio Scarano, Raul Corrêa-Smith, Leonardo Menezes, Ana Paula Teixeira, Davi Bonela and Alexandre Fernandes

This paper aims to introduce and explore one specific type of anticipation, which we call 'regenerative anticipation'. Regenerative anticipation seems particularly relevant in times when planetary wholeness is fractured, and research and practice that anticipate regenerative futures may have positive outcomes related to planetary wellbeing. To build our argument, we combined concepts from biology (stem cells, exaptation, autopoiesis), and perspectives from the knowledge of Brazilian indigenous peoples (ancestral futures). Regenerative anticipation is a potentially important line of research in anticipation studies. It can provide significant inputs to futures literacy, while delivering on decolonial futures perspectives.

Climate Models, Climate Futures, and the Ethics of Probability

Pamela Carralero

This presentation extracts an ethics of probability from the scientific process of climate modeling to explore technology's possible contribution to a decolonial politics of climate anticipation. The argument advances in three stages, beginning with an overview of the critiques that cultural studies has leveled against probability as a concept and practice. Scholars such as Anna Tsing (2005), Arjun Appadurai (2013), and Bernard Steigler (2015) claim that probability statements, calculations, and scenarios across the information technology sector perpetuate a modern, unethical "machinery of risk," in which neocolonial and neoliberal regimes of diagnosis, counting, and accounting inform modes of anticipation and the social imaginary of the fu-

ture. The second part of this presentation claims that, within the machinery of risk, climate change becomes anticipated through what Potawatomi scholar Kyle Powys Whyte calls "crisis epistemology" (3). For Whyte, crisis epistemology describes knowing the world in such a way that any alternative sense of the present (i.e. a climate-changing present, a present of alternative social realities) is experienced as new and, consequently, as an unprecedented crisis requiring urgent resolution and society's return to a previous and approved state of being. In the context of climate change, crisis epistemology highlights dominant ideologies' fear of displacement as human populations begin to reorganize through climate adaptive practices focused on advancing collectives into resilient and climate just post-carbon futures. Crisis epistemology thus reveals the unethical political dimensions of anticipation; any progress towards a more just future is impeded by the anticipation of the future as the near-past, that is, as the re-stabilization of norms (and, by extension, their systemic inequities and inequalities).

Climate models challenge what has so far been cultural studies' blanket critiques of probability. Climate models are systems of differential equations programmed to calculate the probability of future climate impacts and visually simulate their movement on a world map. They function as a metonym; while it is impossible to prophetically see into a climate-changed future, witnessing the movements of climate model graphics allows a spectator to visualize and imagine a warmer planet at local and global scales. Climate probabilities are thus spiked with an affectual current that calls for audiences to think —even momentarily exist—in the future anterior as they anticipate atmospheric and environmental change and consider its social and personal implications. Climate models narrate the present as a time that will have been and stake a claim to the ethical and practical importance of living the changed future now, as opposed to living the future as the normative past or present. In doing so, they highlight

the as-of-yet undefined and thus un-prescribed actions in the present that will serve as metaphorical steppingstones to the future event of successful and just climate adaptation. The ethics of probability sits along these blurred lines of causality.

The final section of this presentation unpacks an ethics of probability and places it in partnership with black feminist writer adrienne maree brown's anti-racist and empowering notion of emergent strategy. Epistemologies of crisis and machineries of risk indulge a limited sense of futurity that counter the ability to both anticipate and realize alternative futures imagined by contemporary anti-colonial, emancipatory, and justice-based social movements. In contrast, the ethical injunction of climate model probabilities—anticipate and live the future as a politics of difference—places a perpetual emphasis on emergence as a collective way of stepping into a new future to transform "the future of the collective before it occurs" (Bryant and Knight, 42-43). For adrienne maree brown, the concept and practice of emergence is an ontological burgeoning within the indices of intentional adaptation and intersecting worlds. Strategies of an emergent ontology include a shift from a culture of strategic planning to one of strategic intentions that, in brown's words, "grow our capacity to embody the just and liberated worlds we long for" (7). Ultimately, this presentation argues that a climate model ethics of probability diagnoses anticipation as a political condition and anticipates adaptation through a politics of difference.

Connection to Future Studies In its focus on an ethics of probability, this presentation deepens existing literature on the ontology of the future (Poli, 2011; Poli, 2021) by highlighting how forms of anticipation impact the nature of being through their relation to time. I take an intersectional approach to anticipation by braiding two grammars and their ontological facets: the future anterior referred to in main-

stream future studies (Bryant and Knight, 2019; Poli, 2021), with its focus on "how to use the future" in decision-making and social organizational processes (Appadurai, 2013; Poli, 2021: 2); and the future anterior utilized in postcolonial, indigenous, and anti-racist disruptions of the ontological architecture of oppressive regimes (Campt, 2017; Rifkin, 2017; Povinelli, 2018; Whyte, 2020), which emphasizes the importance of performing anti-racist reality, "that which is not, but must be" (Campt 17). My emphasis on the capacity of climate models to help conceptualize ethical futures challenges and deepens the very scarce scholarship on climate modeling in the context of future-thinking. Hastrup and Skrystrup in The Social Life of Climate Change Models consider the role of climate models in anticipating nature but not in anticipating more socially just futures (2013). In her ethnography Friction (2005), Anna Tsing critiques climate models' totalizing representation of the planet, which facilitates policymakers' easy forgetting of past, present, and future local social-environmental realities. Importantly, however, climate models and their probabilities do not only circulate at the level of geopolitics but also at the level of collective future-making endeavors within the general public, who relate to climate model probabilities through different, uniquely situated standpoints. In her excellent book Thinking Like a Climate (2020), Hannah Knox considers what happens to people's understanding of themselves, of others, and of the future when "confronted with climate as a 'techno-nature' (Escobar 1999), as a phenomenon that does not fall neatly into a category of either immediate materiality or abstract representation" (5). My presentation explores the relation between these two categories through the anticipatory capacity of climate models' ethics of probability.

12:30-14:00
Independent Paper Session: Policy-Oriented Anticipations

Anticipatory practices as loci for modulating the governance of innovation and socio-technical futures

Kornelia Konrad

Science and technology studies (STS) have shown multiple ways how socio-technical futures feature in the governance of innovation at different levels (Konrad & Böhle 2019). The sociology of expectations has studied promissory statements and discourses related to particular research and innovation fields and their performative roles in research, innovation and policy processes. A further line of research is concerned with (macro)structural phenomena, such as how modes of future-orientation are culturally and historically dependent (Andersson & Keizer 2014), how socio-technical imaginaries are rooted in collective understandings of social life and social order (Jasanoff 2015) or have pointed to particular regimes of future-orientation closely related to modes of innovation, such as (a) regime(s) of promising (Robinson et al. 2021). In parallel, many STS scholars have followed an engaged approach by designing and conducting participatory forms of future deliberation or STS-inspired scenario processes, typically applied and experimented with in various 'local' projects (Konrad et al. 2017). In between work that is concerned with rather persistent structures and specific, often local cases, I would position meso-level work that addresses the underlying anticipatory practices that, either intended or as a side effect, shape socio-technical futures and their very roles in the governance of innovation (Alvial Palavicino 2016), some of those established in particular domains or supported by institutional frameworks. An emblematic example is the ITRS roadmapping process in the semiconductors industry (Meyer et al. 2018); more recently we see a proliferation of 'roadmapping'-related processes and practices at the nexus of sci-

ence, policy and industry; further examples are market forecasts and hype cycle assessments (Alvial & Konrad 2019).

Another important form are various modelling practices common in particular sectors, e.g. in fields like energy and climate change modelling (Aykut 2015). In this paper, I firstly reflect on the usefulness of regime concepts for capturing the specific role of anticipatory practices in the governance of innovation, suggesting that this perspective appears quite fruitful to capture the role of anticipatory practices as embedded in particular, partly sector-specific forms of governing innovation. However, in contrast to a somewhat idealtypical use of the concept (Joly 2010; Robinson et al. 2021), I suggest that taking inspiration from the perspectives of regimes as part of a multi-level perspective (Geels & Kemp 2007) that draws attention to diversity in regimes, change processes and the relations between meso-level regimes, local and niche-like phenomena and wider influential developments could be quite productive for not only understanding how such regimes 'work' and distinguishing idealtypical regimes, but for considering how such anticipatory regimes may differ in more nuanced ways, how they change, and potentially could be modulated. Furthermore, I suggest that the meso-level of practices, embedded in institutional settings, may actually be particularly interesting 'loci' (Rip & Schot 2002) for ambitions to not only study socio-technical futures, but to modulate common promissory 'routines' and dynamics.

Building anticipatory capacity in a multi-level, multi-policy environment: Disruptions and scenarios to underpin EU R&I policies
Attila Havas, K. Matthias Weber, Susanne Giesecke and Dana Wasserbacher

The "Foresight towards the 2nd Strategic Plan for Horizon Europe" project aims at informing the development of the 2nd Strategic Plan of Horizon Europe (HE), the European Union's current Research and Innovation Funding Framework Programme, by employing a combination of different forward-looking approaches.

The Strategic Plans of Horizon Europe explicate how the research and innovation (R&I) initiatives funded by the Framework Programme are expected to contribute to the achievement of major EU policy goals as captured for now by the key strategic orientations of the 1st Strategic Plan of HE. However, already during the implementation of the 1st Strategic Plan, the EU is confronted with novel developments that may hamper achieving the initial ambitions of the 1st Strategic Plan that should be re-considered when devising the 2nd Strategic Plan. These novel developments can arise from the global and EU context of EU R&I policies, but equally from R&D and innovation activities. Of particular interest are those developments that may bring potentially disruptive consequences (e.g., new social confrontations or advances in general AI) – both threatening and promising ones. They will indicate areas in need of particular attention in EU R&I policies, pointing beyond those already identified in the 1st Strategic Plan, and possibly also questioning some of them. In other words, the sequence of Strategic Plans is a means to make the Framework Programme more adaptive and account explicitly for newly emerging developments, with foresight methods applied to ensure that a long-term perspective is taken.
Our project opens a new page in making use of foresight for underpinning the development and adaptation of large-scale policy initiatives in the EU policy context. We argue that it offers the possibility to promote futures thinking and anticipatory capacity building in public sector organisations by introducing new foresight infrastruc-

tures, building inter-organisational networks, and mobilising futures literacy and domain expertise around selected themes to underpin the definition and adaptation of policy strategies and actions.

The project is embedded in a regular interaction process with an intra-EU network of forward-looking thinkers, involving all European Commission Directorates with an active role or stake in R&I. The project also reaches out to EU member states' foresight nodes to stimulate exchange on emerging future challenges and innovation opportunities in selected areas across policy levels. Further, it facilitates debates with a wide range of societal stakeholders. These interactions are organised through online workshops and an online community (futures4europe.org), launched early 2022.

The emphasis on sources of potential disruptions is reflected in the design of the project. Its first component focuses on potentially disruptive developments in the global and EU context. We explore possible future changes in the global and EU context for EU R&I policies to identify those areas of change that might have disruptive impacts on EU's ability to achieve its overarching policy goals.

The first part of the project has reviewed a set of recent forward-looking activities with global scope. The scenarios developed by these activities have been characterised by considering a set of aspects, including • the needs of the client commissioning the study • the methods used • the main features of the scenarios (organising principle/s/, the level of analysis, …) • the main trends, drivers, and key factors underlying the scenarios • the key likely developments in a given future • the actual use and influence of the report on decision-making • critical assessment (novelty of the approach, methods

or scenario architecture; if any; new or surprising elements considered; relevance for EU R&I policies).

We will consider the pros and cons of various scenario approaches, namely the types of scenario architectures used in the reviewed reports; other options used in further prospective analyses; as well as three more generic methodological approaches we experimented with in the first part of the project: multi-level scenarios; disruptions as 'starting points' (their likely impacts explored in different contexts); and narratives (short, focussed descriptions of certain developments, as opposed to scenarios offering a more comprehensive picture of a given future). We will identify methodological differences and elaborate on the particularities of multi-level context scenarios as opposed to other types of scenarios, and their added value for selecting and framing policy issues.

This first, context-oriented component will serve to test the robustness of suggested new emerging, and potentially disruptive, developments that may be possibly included in the 2nd Strategic Plan.

The second component aims at deepening our understanding of disruptive developments in selected areas or research and innovation using horizon scanning and scenario development techniques. This part was implemented in the first half of 2022. The purpose of this second component was to identify candidate areas for inclusion in the 2nd Strategic Plan. Drawing on these two components, a visionary outlook and possible suggestions for the 2nd Strategic Plan will be developed in interaction with the different communities of practice tied to the project. The closing phase of the project will distil policy implications from prospective analyses. In other words, it aims to

interpret how to tackle the disruptive factors at context and area levels, e.g., how to take advantage of the favourable ones; how to prevent or 'amend' the unfavourable ones; and how to adapt to the unstoppable ones. We will consider what processes and approaches would be appropriate for selecting and framing issues when setting R&I policies in an environment characterised by multi-level governance and interactions among policy tools set in different policy domains.

Investing in Imagination Infrastructure for UK Communities
Cassie Robinson

In June 2020, a new grants funding programme was designed and launched by the National Lottery Community Fund, the largest funder of community activity in the UK. The fund was unusual at that time - most funding (from the Lottery and all the other UK-based philanthropic foundations) was going towards serving immediate needs in communities. The Emerging Futures Fund was created, instead, to resource other work: work that focussed more on the possibilities of what could happen beyond or as a result of the crisis, and which explored who would get to shape that future. It was an investment in community-led futuring and collective imagination as a shared public good.

A call went out to communities across the UK, acknowledging how hard it was to imagine alternative futures, but inviting them to do so. The grants were explicitly framed as enquiries - distinct from the narrow prescribed set of options that characterise many public engagement or deliberative democracy exercises where the questions are already defined. Through the grants we wanted communities to

define their own questions. However, the most distinct aspects of the funding programme were a focus on growing the capacity in communities to practise both collective imagination and community-generated foresight, and how this might be best supported through the concept of 'imagination infrastructure.'

The imagination is defined by Yusoff & Gabrys (2011) as a way "of seeing, sensing, thinking, dreaming" that creates "the conditions for material interventions in, and political sensibilities of the world." It is a "site of interplay between the material and the perceptual – a site for framing, contesting, bringing into being." Imagination is thus a transformative practice, which has the capacity to cultivate and foster alternatives to social, political, cultural and economic conditions; it is a prerequisite for changing the world for the better. Infrastructure, on the other hand has been defined by Brian Larkin as "material forms that allow for the possibility of exchange over space". It entered the English language around 100 years ago from French, where it had been used since the mid-19th century as a railway engineering term--referring to the necessary underpinnings of the railroad network--tunnels, culverts, bridges. Over the years, it has gone through various reinventions--from a military term employed by NATO, to the more generic signification of massive capital investments in the basic necessities for societal functioning--roads, sewerage, the electricity grid, and so on. Not everyone agrees (Mattern, 2016), however, that infrastructure is necessarily material—intellectual, informational and institutional structures and operations can also be infrastructures, as can anything "upon which something else rides, or works". It can even consist of people, who do the infrastructural work to move or exchange other things—as with the garbage labourers of Dakar, Senegal who are the focus of Rosalind Fredericks' 2018 book Garbage Citizenship.

At first glance, imagination and infrastructure couldn't be more different – the former implies a latitude of thought, a certain airiness and creativity, and the ability to reach beyond the bounds of the physical and spatial realities of the world; the latter, on the other hand, implies solidity, functionality, and the banality that often comes with those necessary matters of everyday life that often remain unseen, unnoticed, unthought of. Indeed, there are those who question the suitability of the term infrastructure at all when dealing with complexity, entanglement and interdependence, given its etymological implications of verticality or subsidiarity (Prescott 2016).

When combined, though, the amalgam 'imagination infrastructure' evokes more than the sum of its two parts. Infrastructure builds imaginative capacity - it finds ways to scaffold, support and strengthen what is emerging - an infrastructure, both physical and metaphysical, tangible and intangible, to enable the development, the practices and use of collective imagination. The Emerging Futures Fund was particularly interested in how the collective worked - what it means for us to imagine together, how the grouping of intelligence progresses our ability to envisage and build different futures. 51 grants were made back in 2020 to communities across the UK. Barrow's New Constellation is a project which brought the residents of Barrow-in-Furness together to co-create a new constellation for their community. This work drew on the collective intelligence, diverse experiences and situated knowledges (Haraway, 1988) of the project participants to create a set of principles - a compass- that will inform a new direction for the town, including how funds from Government will be spent. The project received significant buy-in from the local authority, who have committed to using the 'new constellation' produced by the collective to guide its transformation as it emerges from the travails of Covid-19 and beyond. The New Constellation project is now building on this success, with an invitation to work with the people of Sheffield to imagine the city's future. A

similar project is the Department of Dreams at Civic Square in Birmingham which was funded through the programme. Their work strengthens the capacity of communities to imagine the future by designing tools and resources with them to do this, and to further develop their projects and ideas. They talk about organising all of their work "around the principle that every single thing we touch, commit to, invest in and design should incorporate dream, dark and ordinary matter components." Imagination infrastructuring goes beyond the concrete tangibility of traditional infrastructures. It also encompasses the narrative infrastructure that informs peoples' day-to-day lives. Projects like Doorstep Revolution, by Gentle/Radical were funded to do some of this highly localised narrative work. Doorstep Revolution involved doorstep interviews with residents of Riverside, Cardiff to gather their stories, narratives and perspectives on lockdown - including insights on how residents want to see the future of their neighbourhood.

These are just a few examples of what was funded but we have been able to work alongside and follow all 51 initiatives over the last 2 years, gathering evidence of what's happening, what's working and what's changing as it unfolds.

12:30-14:00
Techniques Workshop: Analyzing Future Social Value from Scenarios: An Invitation and Experiment
Michael Bernstein, Lauren Withycombe Keeler, Luke Boyle and John Harlow

In futures studies, it is difficult to generate plausible knowledge of what people might care about, how these cares relate to issues of

need satisfaction at an individual level, and how these matters of individual need satisfaction might aggregate up to the level of future societal values—to move between big futures and little futures (Michael, 2017). In this technique workshop, we will draw upon the human-scale development approach (H-SD) (Max-Neef, 1992) to help participants (acting as imagined community members), "see" little futures in big futures--identifying future states and modes of need satisfaction. Once collected in this manner, our proposal is that such individual imaginings can be aggregated into "future social values", which we define based on research in our project, KAITEKI: Future Social Value of Business, as justifiable claims about what may be important to a group of people, informed by an understanding of what people may have and do and how they may be and interact in order to satisfy human needs. Our aim is to experiment with Anticipations participants on the viability of this technique for use in community settings. As we pioneered this approach within our research team, this technique workshop will be a check of feasibility and a key, responsible approach to methodological innovation in the field (i.e., not experimenting with communities).

We invite participants to inhabit roles as community members with different socioeconomic, sociodemographic descriptors. After introducing four plausible future scenarios to participants, we will ask individuals to imagine ways in which their needs in their imagined communities may or may not be met in these divergent futures. We will conclude with plenary reflection considering how subsequent analysis based on this technique could work in practice with real community and stakeholder partners. The setting for our work will be a quartet of participatory, intuitive-logics-based scenarios of aging in smart environments in the U.S. in 2050 (Keeler & Bernstein, 2021), scenarios, in which we explored key uncertainties across dimensions

of intergenerational relations; interpersonal and human-environment connections; information and sensing; potential need satisfaction; and policy and political driving forces.

The human-scale development (H-SD) approach seeks to empower people and communities to enhance need satisfaction in the pursuit of "living well" (Cruz et al., 2009). Pioneered in participatory action research for sustainability, the approach is highly focused on uncovering ways in which community needs in the present are systematically undermined (i.e., contributing to human impoverishment), systematically supported, and might systematically be enhanced through concerted action. Needs are asserted, ontologically, to be finite, few, and classifiable; change only slowly across time and cultures (of course, subject to variations by dimensions of identity, physical and psychological ability, group collective characteristics); and satisfied through more rapidly changing modes of existence (being, having, doing, and interacting) (Guillén-Royo, 2016). Our approach explores a novel way to involve communities in co-creating insight into how individual needs and collective social values may or may not be advanced in different plausible future scenarios. Our methodological proposal, explored first through thought experiment and, subsequently we hope, with Anticipations conference attendees attempts a community-driven, needs-based approach to future social value identification. Doing so would contribute to addressing a tendency in expert-driven foresight to uncritically or unreflexively "project" the values of the analyst onto futures and future people—a methodological "hampering factor"(Urueña et al., 2021)—in deployment of foresight techniques in support of responsible research and innovation and anticipatory governance.

12:30-14:00

Techniques Workshop: Prototyping Social Forms Techniques Workshop
– Enacting and Sensing Body
Dulmini Perera, Muindi F Muindi, Xin Wei Sha, Teoma Naccarato and John MacCallum

Part of the Prototyping Social Forms "Un altro mondo è possibile" Stream

"Detourning" the notion of anticipation, we offer a workshop on enacting alternatives to what is the case. Supplementing techniques for extrapolating from the present to the future, the interdisciplinary and international collective Prototyping Social Forms (PSF) develops platforms, tactics, and technologies to make locally generated knowledge transportable and transformable, forming such knowledge into "germs" that can "sprout" in disparate learning and research environments.

For the purposes of this PSF Techniques Workshop, we interpret bodies as energetically bounded entities that can affect and be affected by one another – bodies like microbes, humans, and cities. We introduce and compare techniques for speculatively enacting more-than-human ethical as well as aesthetic ventures.

• Germ 3: Atmosphere (Foerster) We adapt techniques for preparing selves for sensing non-local, extended qualities of atmosphere and metabolism, interpreted as multivalent fields of distributed matter, energy, affect. In particular we introduce Butoh techniques that can be exercised with people in their own rooms as well as in a comfortable outdoor / indoor common space

• Germ 4: Sense-making Complexity (Sha, Perera) We introduce structured improvisational tactics for designing urban spaces for change, paradox and play. Techniques include pirated board games and alternate reality propositional play.

12:30-14:00
Curated Session: Anticipation in the scale of 'Deep Time'
Keri Facer, Bruce Tonn, Ted Fuller and Richard Sandford

The early years of futures studies were informed by a concern with time horizons beyond the human scale – with topics such as the impact of nuclear war or chemical pollution on long-future generations. The concept of the 'long-term' was engaged as a technical problem (can it be envisaged) an ethical responsibility (how to care for such futures) and an opportunity (can it be managed and exploited) (Andersson, 2018). As both anticipation theory and futures practice have evolved, however, they have tended (with some notable exceptions, see for example Galtung & Inayatullah, 2001; Tonn 2021) to refocus attention towards futures conceived within the timescale of the individual, the political cycle or, in the case of anticipation in biological traditions, the organism. This is a temporal frame that is demonstrably inadequate to engage the more-than-human timescales of contemporary challenges – from ecological and climate degradation to the questions raised by the emergence of biosynthetic life forms – as well as the (still) ongoing threat of nuclear conflict and its temporally extended legacies.

This session aims to explore what it might mean to systematically anticipate in the scale of deep time – to grapple with what Kathryn Yusoff calls the changed conception of the human as a form of 'geo-

logical life… a collective being and subject capable of geomorphic acts; a being that not just affects geology, but is an intemperate force within it'. It seeks, equally, to respond to Michelle Bastian's critique that dominant temporal frames do not help us to 'tell the time' in the slow emergency of climate change – and that coordinating human and more than human timescales are essential to the continuation of thriving human and more than human worlds. (Bastian, 2012)

To explore this challenge of how we might begin to develop a theory of deep time anticipation, we bring together four different perspectives: Facer's attention to pedagogies drawing on feminist and non-western theories of time as tools to widen the temporal imagination; Tonn's attention to cognitive barriers to thinking in more-than-human timescales; Sandford's exploration of political and civil society practice; and Fuller's exploration of the moral and ethical issues of 'taking responsibility' in these times.

The session aims to open up the question, central to this conference – if we are interested in Just Futures, what is our responsibility and capacity to think and engage with justice at the scale of deep time?

The contributions
Keri Facer (Professor of Educational and Social Futures, University of Bristol; Professor of Education for Sustainable Development, University of Gothenburg) will explore two key concepts: the temporal imagination (the way in which we relate to and conceptualise time) and temporal pedagogy (strategies for teaching with and through time). She will explore how the temporal imagination has been narrowed to particular conceptions of linear, quantifiable and individualised time in western schooling practices and the implications this

may have for anticipatory practices over deep time. She will draw on a series of experimental programmes she is developing with artist Solveig Settemsdal and educator Penny Hay, to to explore how we might begin to feel and sense deep time in the present. Her contribution will focus specifically on an attempt to connect with deep time through material practices in the body, and to consider what it means to engage affectively with more than human temporalities. The contribution will draw on breath work, sculpture and participatory body work as well as insights from relational physics, to begin to both conceptualise and physically sense the embodiment of time at a different scale from the human life span.

Bruce Tonn (Senior Researcher Three3 and Professor University of Knoxville) argues that while there are many calls to care for future generations, there few attempts to systematically develop the capacity to understand the nature of the threats that such future generations might face over deep time or to develop our capacities to fulfil these obligations. He argues that eight forms of cognitive dissonance plague efforts to achieve this next phase of human development, from the difficulty of imagining time several thousand years hence, to the resistance (political and personal) to identifying with the 'other' over the self, to the tension between desires for open futures versus the creation of firm commitments. He explores how some of these forms of dissonance arise when individuals attempt to reconcile commitments to meet obligations to future generations, which feel firm and claustrophobic, with desires for culture freedom and cultural change. The balance of his contribution will explore solutions to overcome or at least ameliorate to a satisfactory extent cognitive dissonances associated with caring for future generations and anticipatory thought. The list of potential solutions will include the organisation of safe forums to discuss why we should care about fu-

ture generations; development of metrics and scorecards for meeting obligations to future generations – to provide concrete goals that can be measured in current time; emphasizing that maintaining options is an important obligation to both current and future generations.

Ted Fuller (Lincoln University, Editor in Chief Futures) : Responsible Anticipation of Deep Time This paper looks at the history of conceptualisations of deep time, understood as geological time, in western traditions of thought. In particular it explores how traditions of geological thinking have oriented western thought towards a view of deep history as the system designed to maintain the habitable Earth, a (Deistic) mechanism keeping the world eternally suitable for humans. A "system in which wisdom and benevolence conduct the endless order of a changing world – what a comfort for man…" (Hutton, 1785). In contrast, the Anthropocene demonstrates that while geological earth is not dependent upon human kind for its continuity, the humanly habitable earth is. This constitutes a 'flip' in the anticpatory model, and indeed, adds a new temporal element to anticipation. Anticipation is thus a nexus of relationships between human time, ecological time (Rosenzweig, 1971) and deep time. Fuller will explore the moral and ethical implications of this - drawing on Ord (2020) and MacAskill (2021) to explore the moral case for a longtermism that is able to think with deep time.

Richard Sandford, UCL: Long-time versus deep-time thinking This paper will explore two competing conceptualisations of more than human timescales in futures and anticipatory thinking. It discusses the forms of 'long-time' approaches that are exemplified within modernist projects like the Long Now Foundation and the long-termism endorsed by the 'efective altruism project', as well as in social innovation groups such as the Long Time Project and policy initia-

tives like the Future Generations Commissioner for Wales. He will argue that these projects, despite their very often different visions of society and change, construct a far future by extending temporal grids (whether clock time or generational sequences) out from the present in ways that project the interests, values and categories of the present forwards, historicising past and future in a way that distinguishes between things 'happening now' and 'happening later'. In contrast, 'deep time' approaches seen within popular non-fiction (Gordon, 2021; Farrier, 2020; Raffles, 2020; Macfarlane, 2019) and more academic projects adjacent to geographical and anthropological fields of enquiry — offer encounters with time that allow for ways of stepping outside the temporal grids used to construct 'long time'. In deep time, temporality may be layered and multiple, relative, irregular, uncertain, and ahistorical, making the world strange through unconformities. Deep time, in this sense, situates us, not outside processes taking place in some other time, but within the same processes that brought oxygen to the planet's surface and will some day end the movement of tectonic plates. Rather than extend ourselves further along a sequence that begins in our present, deep time offers an opportunity to develop a sense of the world being continually produced through unfolding processes working at many scales and paces. The paper will explore what putting these two approaches into dialogue might offer as resources for replacing modernist notions of time for those that offer the potential for more deeply transformative change.

12:30-14:00
Independent Paper Session: Theories of Anticipation

Anticipatory Social Systems in Post-Normal Times: Moving Beyond Power, Politics, Polemics and the Past

Jayne Fleener

Building off the work of Roberto Poli (2010) and neo-institutionalism (Friedland & Alford, 1991), the challenges of rethinking fundamental social metaphors and values will be explored. The case will be made that we are entering post-normal times (Sardar & Sweeney, 2016, 2020) which presents additional challenges for whole systems transformation. Anticipatory social systems theory (Miller, 2018) will address the challenges of PNT as related to existing "unknown unknowns" associated with and requiring emergent solutions for global transformations. A queering futures approach (Fleener & Coble, 2022) will serve as a launching pad for "making strange" critical approaches to social transformation to explore ethical shifts that transcend power and dualistic polemics, guiding more equitable, just, and fair futures.

Future temporalities – advancing time concepts in contemporary anticipation practice

Ludwig Weh, Marguerite Coetzee and Lisa Kinne

Anticipatory methods are determined by highly subjective, culturally dependent concepts not only about 'the future' itself, but also about ways of its description in social theory; resulting disputes within the community reveal how futurists have engaged in epistemological discourse to shape futures studies as a field. Growing social complexity is changing the methods and paradigms of applied social sciences such as futures studies ideating, informing and enacting social change. Resulting images of the future do not only reflect changing futures epistemologies, but also changing conceptions of time. This paper presents time concepts traditionally rooted in fu-

tures studies, and ideates possible advancements to the understanding of time and temporality shaped by material-discursive practices within contemporary dynamic realities.

14:30-16:00
Independent Paper Session: Critical Anticipatory Capacities

Futures as Chaos Attractors: the need for wild, feral, outlier archetypes
Wendy Schultz

This paper ties together core concepts in futures research –the futures cone and futures archetypes – with both chaos theory and complexity theory as relevant to understanding the emergence of, and potential responses to, postnormal times. This provides a structured argument that reinforces the need for decolonizing futures and radically extending participation in imagining and exploring futures: essentially, increased turbulence and emergent postnormal times require wild and feral outlier futures archetypes to challenge our invincible ignorance and fully explore the high dimensionality of deep uncertainty and intensified chaos.

From anticipatory capacity to anticipation intelligence (AQ)
Leila Varley and Shirin Elahi

Anticipation Intelligence (AQ) reframes anticipatory capacities explicitly around the individual, their sense of agency over their own future and moves it into a practical skillset. We know that anticipation is a critical capacity that becomes increasingly important in uncertain and complex times as it enables us to better understand how

our context might be changing. However, the value of anticipation lies not in the anticipation itself, but in the ability to utilise the insights and reflections that the process of anticipation generates. The thinking process on its own is not necessarily valuable – anticipation that results in paralysis (paralysis by analysis) is such an example. Anticipation comes to its own when it is combined with the doing process, i.e. the ability to take strategic action and adapt. It is in the process of doing, and thereby using the outputs that anticipation has generated, that value is created.

The value of anticipation is further amplified when this critical capacity is combined with other complementary ones such as systems thinking, emotional intelligence and psychological awareness. We have reframed these as foresight, topsight and insight.

Foresight involves anticipatory capabilities, exploring ideas about the future. Without foresight, the trajectory into the future is blind. Topsight requires systems thinking, a systemic understanding of the complexities of our environment. Without topsight, the overview of the dynamics of the wider system or competitive landscape, no individual or collective is likely to be able to anticipate well. Insight involves a deep understanding of the self, our place in the world as well as our mental models, assumptions and blindspots. Without insight of the 'self', whether individual or collective, the path taken is unlikely to be aligned with internal values and purpose. Each of these capacities on its own is of high value. However, it is the combination of these three capacities that form the data gathering thinking process and the contextual knowledge necessary to inform smart, strategic action.

Thinking (or policymaking) alone is insufficient—it is the doing that matters. We term this strategic action, a process of context-specific judgment regarding the appropriateness of available information together with strategic decision-making regarding when and how to take action that is both timely and appropriate. This process is iterative and acknowledges that we are operating in dynamic environments where the external context does not stop changing. Therefore, strategic action will generate further knowledge – both acquisition of new knowledge or jettisoning of obsolete knowledge – that will inform and guide future action.

In our opinion, the combination of these skills – foresight, topsight, insight and strategic action - can be collectively viewed as an intelligence. We term this anticipation intelligence, or AQ. While cognitive intelligence, termed IQ, was considered to matter most in the late 19th and early 20th century, emotional intelligence, termed EQ, came to the fore as the world globalized. The 21st century demands a new form of intelligence with a focus on the future, AQ.

In today's increasingly complex and uncertain world, change has become a constant. As individuals, groups, institutions, systems and cultures have greater likelihood of need for adaptation, AQ becomes all the more critical. AQ is, in our opinion, first and foremost an individual skillset. AQ can empower the individual, providing them with the tools necessary to navigate a turbulent future, and the potential for increased wellbeing, greater agency, and more ability to interact constructively within society.

Without such intelligent individuals, there cannot be collective intelligence. Any collective, whether organisations, communities and

governments, are groups of individuals. Clearly, there is significant potential for AQ in these contexts. In fact, it might even be essential, because the growing 'trust deficit' affecting organisational and institutional levels can undermine their 'license to operate'.

If we are to have societies, governments and businesses with high collective AQ – the ability to make wiser decisions faster and more economically than those that don't – they must be made up of individuals with high AQ. Integration of AQ will be very different from traditional modes of knowledge transfer, and would require new ways that enable open-minded engagement and harness the learning of multiple individuals with high AQ into a collective AQ. Yet the value would be immense. A society where AQ is valued is more likely to find ways to make wise decisions that ideally help it to flourish, or at least ensure its survival. A government with many individuals with a high AQ is more likely to make policy decisions that have a longer-term, more holistic outlook – which in turn is likely to gain greater societal acceptance. An organisation comprising individuals with high AQ is likely to be more adaptive and resilient to its environment.

Models of the Future: The Capitalist Quest for Grand Narratives
Adrienne Sörbom and Christina Garsten

In 1976 Jean-Francois Lyotard, suggested the death of the grand narrative of modernism, and to term the new phase of modernity "postmodern". Although full of issues, vagueness and contradictions, we find it reasonable now, more than four decades later, to acknowledge that Lyotard, Baudrillard, Derrida and Jameson, to name but a few, generally were correct in their diagnosis of modernity. If no one had

invented "postmodernism" already in the 1970s, by now someone would. However, even though this (grand) narrative of a decentralized version of modernity essentially have come to prove correct, many actors are still constructing fundamentally modern narratives.

In this paper, we suggest understanding the travelling of models, by which to understand the future, as part of the powerful language games of postmodernity, but essentially presenting and relating to modern grand narratives. Especially, we suggest to make use of notions of postmodernity, for instance on the implosion of distinctions and boundaries (from Kellner), and the expansion of capitalism towards the society of the spectacle (byDebord), in order to analyze contemporary language games in regard to the organization of the future.

Specifically, we wish to present an industry, in which especially the technological grand narrative of modernity lives on. It is an industry attempting to package and sell the time to come. We term it the Future Industry (FI), selling products such as models, templates, games, indexes and courses for understanding and preparing for the future. We suggest seeing these products as tools, used for the production of the imaginaries of postmodernity, and possibly hyper-modernity (Augé 1995).

To this end, this paper draws on ongoing fieldwork among futurists in two US-based think tanks. These organizations define themselves as think tanks, working in the interest of humankind, raising future competencies. We have followed them over time, doing interviews, participated in day-to-day activities and read their documents. The paper aims at conceptualizing their attempts to advance concepts, models and scenarios of the future, as part of postmodern political reflections of capitalism in the 21st century. Although not speaking

in political ideological terms, the actors of the FI compose, design and disseminate visions and models for the future, in the Geertzian sense of the term (Geertz 1973), including future policy making. Drawing on the concept of anticipatory governance, as elaborated by Flyverbom and Garsten in 2021, they form parts of a machinery of prospects, based on grand narratives and bold visions, primarily on technological advancements.

14:30-16:00
Independent Paper Session: Energizing Public Futures

Stakeholder inclusion and anticipation on techno-economic data for long-term energy planning
Per Dannemand Andersen and Antti Silvast

This paper confronts the overall research question of what is the nature and quality of the contributions of experts, stakeholders, and the wider public in detailed techno-economical input to scenario analyses used for debating and policy decisions on the sustainable transition.

Empirically, the paper considers the case of the 'Danish Technology Catalogues'. There are multiple techno-economic pathways for the transition to a sustainable energy system (Rosenbloom, 2017). In this sense, there are plural sustainable futures. To address this, like other countries, Denmark employs a range of foresight and anticipatory approaches to establish a platform for debate on possible ways to a sustainable future that meet international targets for CO_2 reductions. The Danish Energy Agency uses model-based scenarios to analyse different techno-economic pathways to achieve the sustainable transition of the energy system. The scenarios describe alternative fu-

tures and their implications. Possible consequences of these alternative futures are examined using an energy systems model based on the TIMES model framework. The scenarios and their consequences are used as a foundation for discussions and policy decisions on the sustainable transition.

All modelling is based on a range of input and epistemic assumptions about the future including whether it can be predicted in any useful modelling process (Silvast et al., 2020). In the Danish case, some inputs are based on internationally recognized forecasts provided by international organizations like World Energy Outlook from IEA. However, the Danish Energy Agency also develops the 'Danish Technology Catalogues'. For each technology (e.g., large wind turbines offshore), a description of the present state of the technology and future prospectives are described, including assessments of future techno-economic data (e.g., cost and performance data) for time horizons of 2020, 2030, 2040 and 2050. The techno-economic data typically contain technical issues (e.g., average unit size, outage percentage, technical lifetime, regulatory ability) and economic issues (e.g., CAPEX and O&M). If relevant, the assessments also contain environmental impact (e.g., emissions of SO_2, NO_x, and particles). The methodology used for establishing the data sets includes traditional foresight methods such as defining the technology, finding and selecting experts and stakeholders, expert reports, extrapolations, stakeholder workshops, wider public consulting, and dissemination of the results. The Danish Technology Catalogues are not only an exemplar of energy policy planning in Denmark. The data and the methods behind the data have become international influential and utilized as a more detailed and updated alternative to projections by international actors, e.g., IEA/OECD. Similar energy tech-

nology catalogues were developed for India in a governmental India-Denmark Energy Partnership.

The theoretical framework behind this paper draws from two coherent and established theoretical fields that are of relevance for addressing the research questions. First, we consider Science and Technology Studies approaches on public engagement in science and technology (Rowe and Frewer, 2005; Stirling, 2008; Stilgoe, Lock and Wilsdon, 2014; Kern, 2015; Selin et al., 2016), which we bring into the field of anticipation research. A sizable literature on this topic has documented that involving stakeholders and citizens in debates and research about science and technology is generally seen as crucial to secure an impact on actual policymaking and produce positive societal outcomes. However, Chilvers and Kearnes have recognized two different and potentially incompatible research and policy interests: one a normative interest in increasing participation and democracy, another a constructivist approach on a situated description of how the concept of the public is produced in different interventions (Chilvers and Kearnes, 2020). As both these lines show, the concepts of experts and stakeholders are contested and debated (Stirling, 2008; Freeman et al., 2010; Colvin, Witt and Lacey, 2016; Miles, 2017), both as concerns who is a participant in democratic processes and as concerns how these participants are constructed, and several studies have pointed at the blurred distinctions between experts, stakeholders, and researchers (Andersen, Hansen and Selin, 2021). Second, we draw on the extensive literature on foresight, scenario planning and stakeholder involvement in scenarios. Scenarios are here considered as a method to engage stakeholders in a strategic conversation on exploring uncertainties, plotting alternative futures, and devising resilience policy and strategy options (van der Heiden, 1996; Cairns et al., 2013; Ramirez and Wilkingson, 2016).

Bringing insights from these two literatures together allows us to produce novel contributions considering how ideas of the future inform action in the present, especially by relying on assumptions about stakeholders and expertise that have implications for fairness and equity and should hence be opened up to critical inquiry and practical development. There exist a wealth of studies on stakeholder involvement in scenario planning in the domain of energy and sustainable development (Chilvers, Pallett and Hargreaves, 2018; Sovacool et al., 2020; Andersen, Hansen and Selin, 2021; McGookin, Ó Gallachóir and Byrne, 2021). Furthermore, the asymmetric distribution of resources and power relations in scenario planning is an extensive research topic in scenario planning literature (Wright, Cairns and Bradfield, 2013; Cairns, Wright and Fairbrother, 2016; Bourgeois et al., 2017; Cairns and Wright, 2019). However, recent literature has tended to focus on engagement, particularly as public deliberation (Sovacool et al., 2020) and everyday engagement with energy technologies (Ryghaug, Skjølsvold and Heidenreich, 2018). Only a few studies exist on the very front end of the scenario process, where experts and stakeholder representatives are often involved in identifying assumptions about future trends and providing basic data (Andersen, Hansen and Selin, 2021). Although – or because of - the predictive nature of the assessments of techno-economic futures of the energy technologies, uncertainty is a key issue. Processes leading to plausible and reliable techno-economic data for future energy technologies are not trivial. There is a lack of studies of such data, particularly for emerging technologies (Fodstad et al., forthcoming). This situation makes the normally hidden data and methods underpinning energy futures, including their production, of interest to all those engaging with anticipation.

Anticipating the Long-Future: Consent-Based Siting for Nuclear Waste Management

Jennifer Richter, Michael Bernstein and Mahmud Farooque

This presentation will discuss the current state of consent-based siting (CBS) for nuclear waste in the U.S. After discussing the historical context of nuclear waste management, we turn to the current approach to a CBS process, and make recommendations for a CBS process that is driven by principles of equity and justice, rather than technocratic decision-making. We argue that, if done well, a CBS process could serve as a model for participatory technology assessment (pTA) for complex temporal and spatial sociotechnical issues, in order to create broader social capacity, as well as a dedicated political space, for anticipating future uncertainty in waste management.

The U.S. has been mired in 70 years of conflicting and contested approaches to managing the back-end of the nuclear fuel cycle; currently all efforts to manage commercial nuclear waste have stalled and ultimately failed. The U.S. government focused its efforts in the early era of atomic invention on producing increasingly powerful nuclear weapons, as well as developing a commercial nuclear energy industry; waste was viewed as an after-thought. In both these endeavors, the U.S. government relied on a highly technocratic process of decision-making, based on sociotechnical imaginaries of containment of the destructive atom, and control of the peaceful atom (Jasanoff & Kim 2009). In 1982, Congress passed the Nuclear Waste Policy Act (NWPA) to expedite the site selection and creation of a permanent waste repository in the U.S; the 1987 amendment focused on one site, Yucca Mountain in Nevada, legally binding all federal studies and funding to this one site (Carter 1987). Yet, Yucca Mountain never opened, and understanding the long roots of this failure requires ac-

knowledging and recognizing the ways that nuclear waste management was perceived as a technical issue that could be expediently resolved through the judicious application of scientific inquiry and technological innovation, rather than a political issue that requires layers of public engagement and a focus on the political process of decision-making in a democracy.

The selection of Yucca Mountain violated the principles of environmental justice, including distributive, recognition, and participatory justice. The NWPA did not involve a discussion of the risks and benefits of storing nuclear waste to local communities, nor did it involve any recognition of the transportation routes across states to bring spent nuclear fuel (SNF) to Nevada. Risks were assumed to be contained by the design of the repository, without clear long-term evidence that the site would be suitable over millennia. The historical misrecognition of Indigenous communities, as well as the veto of the state of Nevada, in the area were also ignored or overridden; leaving a of mistrust in this utilitarian approach to decision-making. Finally, there has been a systemic lack of participatory engagement and consultation with the different publics, including communities along transportation routes, tribal communities that resist nuclear waste, and state policy-makers (Endres 2012).

In 2010, a "Blue Ribbon Commission for America's Nuclear Future" was appointed by President Obama to make new recommendations for storing SNF. After two year of meeting with local, national, and international community stakeholders and policy-makers, they recommended that the DOE pursue a CBS approach to managing SNF. In 2015, the DOE initiated several initiatives for gathering public input into creating a CBS process, including several roundtable forums with invited speakers from nuclear communities, tribal representa-

tives, and anti-nuclear activists. The DOE also contracted with the Expert and Citizen Assessment of Science and Technology (ECAST) group based at ASU to create a public forum for discussion of elements that would inform the creation of a CBS process that would be held in early 2017 (Richter et al 2022).

After the presidential election in 2016, the DOE cancelled all CBS projects, including the ECAST project, citing a shift in executive priorities. In 2021, President Biden resurrected the CBS process, with a request for public information for a CBS process for interim waste storage. It is an ideal time to re-examine the work that the ECAST project did in relation to understanding the major concerns of CBS, which include ethical/legal, logistical, and bureaucratic issues, such as: 1) Ethical/legal concerns, including: defining risks and benefits of nuclear waste, how to collectively define consent, how can consent be provisionally given/ withdrawn, what amendments need to be made to the NWPA to allow for broader conversations for CBS; 2) Logistical concerns, such as: What constitutes a community, representation of a community, and flexibility over intergenerational political, social, and environmental change; 3) Bureaucratic hurdles, such as: milestones for CBS, transparency in communication and information, how to build trust in agencies, creating an independent agency, and conflicts with existing policies.

A CBS process should ideally "flip" the existing model of engagement, by focusing on equity and justice for present and future generations as an outcome, in creating a resilient system of SNF management. We will discuss our recommendations for both the CBS process: including a focus on collectively produced milestones rather than narrow timetables, a DOE process that focuses on growing the capacity and capabilities of local communities, rather than a final repository, and the creation of an independent agency that can bro-

ker public and federal interests. Ultimately, we hope that any approach to SNF management that focuses on public engagement, participatory technology assessment, and equity and justice will also be of use to other complex sociotechnical issues.

Exploring the Unanticipated Consequences of UK Net Zero Transport Policy with Participatory Systems Mapping: the need for participatory whole systems approaches to transport decarbonisation, air quality and health

Alexandra Penn, Suzanne Bartington, Sarah Moller, Ian Hamilton, James Levine, Kirstie Hatcher and Nigel Gilbert

In a drive to achieve Net Zero emissions, UK transport decarbonisation policies are predominantly focussed on measures to promote the uptake and use of personal electric vehicles (EVs). This is reflected in the COP26 Transport Declaration signed by 38 national governments, alongside city region governments, vehicle manufacturers and investors. This focus on technological, market-based, individual-level "solutions" to complex environmental and social problems is alluring. However, it is potentially problematic in the reality of complex, interconnected socio-technical systems in which many different, and potentially conflicting, collective and individual, social and environmental goals exist and interact. Emerging evidence suggests that EVs present multiple challenges for air quality, mobility and health, including risks from non-exhaust emissions (NEEs) and increasing reliance on vehicles for short trips.

Understanding the interconnected links between electric mobility, human health and the environment, including synergies, trade-offs and differential impacts on different groups, requires an inclusive,

whole systems approach to transport policymaking. We describe the use of Participatory Systems Mapping (PSM) in which a diverse group of stakeholders collaboratively constructed a causal model of the UK surface transport system through a series of interactive online workshops. PSM is a participatory modelling approach which allows rapid production of models from stakeholder knowledge, without the need for empirical data. The resulting models, or "maps", can contain factors and interconnections from any domain, qualitative or quantifiable. They can produce an integrated picture of how unanticipated consequences of interventions could play out in a system. By connecting different stakeholder's knowledge of different parts of the system into one model, we can uncover potential long causal chains and indirect effects that span completely different parts of the system, that no one person might have predicted and would thus often not be anticipated in policy or intervention design or appraisal. Crucially, they capture what matters to stakeholders in the system, both with regards to desired outcomes and the causal interconnections that exist. We will present the map and its analysis, with our findings illustrating how unintended consequences of EV focussed transport policies may have negative impacts on air quality, human health, community liveability and important social functions of the transport system. And how these impacts may disproportionately affect already marginalised communities who may not have the resources to themselves purchase EVs and participate in the imagined personal EV future. Further, how these impacts may cause positive feedback effects, or so-called vicious cycles, in which increasing EV use suppresses other alternative forms of transport or modes of existence in within communities. We will discuss how participatory causal modelling techniques could be used to facilitate effective policy design and appraisal in ways that take account of and work with system complexity and take account of multiple different needs and desired futures.

Finally, we will open a conversation about how participatory mapping approaches might be used in participatory system design contexts to empower stakeholders to both envisage possible futures for their complex systems and to engage in participatory "steering" approaches. Developing their own potential, workable interventions that leverage system complexity to steer their complex systems towards the outcomes which they have chosen.

14:30-16:00
Curated Session: Foresight's Special Issue on Reconceptualising Foresight and its Impact: Learning about the Capacity to Decolonise
Riel Miller, Geci Karuri-Sebina and Kwamou Eva Feukeu

Following the codesign in 2020 of the Capacity to Decolonize (C2D) - an audacious action research initiative based upon an innovative articulation of decolonial studies and futures studies - in 2021, we launched a foresight journal Special Issue on "Re-conceptualising Foresight and its Impact: Experiences in Decolonising Futures from the Global South" to be printed in September 2022. Our goal with the Special Issue was to work further into an enquiry into using futures literacy as a basis for reexamining and cross-learning between both disciplines (futures and decolonial studies) having recognised the disturbing reproduction of oppression in (or in spite of) the way societies have been using the future.

We were also specifically grounding our enquiry in the global South for three reasons. First, we made the assumption that solutions to system autopoiesis (or self-referentialism) cannot be found within the system itself. Decolonising futures requires purposefully opening

up to different languages, different ideas and different framings from the disciplinary norms. It is therefore in locations (both temporal and spatial) that have alerted the world of such limitations that we seek out avenues for the evolution and transformation of the discipline of anticipation as a whole. Second, reaffirmed claims on 'Whose futures matter?' have recontextualised the central role of power in the formation, negotiation and display of futures. Foresight has predominantly been articulated as an instrument to set particular voices forward. Change in both representation and ideation can only be intentional. This special issue has therefore purposely sought out less heard voices, perspectives and epistemologies on the issues. Third, to advance the field, we were also looking into profiles that were not necessarily trained futures scholars or practitioners, but some who have come across the diversity of futures to advance their respective works and what it meant for knowledge creation to push for more contextualised futures.

These key lenses were motivated for the Special Issue on the basis that current and emerging theorisation on foresight and futures literacy have continued to be dominated by the global North, while the global South also has important and unique perspectives to share with the world to present alternative praxis and advance action research for decolonial theory and futures studies (Siam, Desai & Ritskes, 2012; Mignolo & Walsh, 2018; Sriprakash & Krishnan, 2020; Santos, 2014; Odora-Hoppers, 2002). The importance of context in authentic anticipatory systems was also being recognised (Sardar, 1993; Appadurai, 2013; Miller, 2015), and foresight impact was posted as lying in the inclusion of the margins to collectively build and systemically renegotiate the shape and content of pluriversal futures (Feukeu et al, 2021; Paradies, 2020).

In this session, we will review, as guest editors, the nature of response we got from prospective and confirmed authors. We were awakened to the conceptual and instrumental tensions in the use of the frame. We believed that we had offered an open understanding of decoloniality considering its different accession in Latin America and Africa for instance. However, it was interesting to see how the term 'decolonial' itself was tripping coauthors in coming to their own conclusions in their own contexts. It was not only the concept of 'decoloniality,' but also the difficulty to root claims within a specific discipline. What it means for the future of foresight will also be explored through the panel.

The panel session will explore the opportunity of the decolonial turn to explain the transition from futures studies to the discipline of anticipation. It is about more voices, more transdisciplinarity, but also new ontologies and teleologies (the valorisation of more reasons for using the future). It will also help define and contrast the different forms of decoloniality in futures through 3 sections: the people/voices in postactivism (repurposing futures), the languages in futures (re-articulating futures) and a revised history of futures (re-telling the history of futures). These three sections will also contemplate methodological implications for futures.

14:30-16:00
Curated Session: Prototyping Social Forms: UN ALTRO MONDO È POSSIBILE "Another world is possible"
Xin Wei Sha, Muindi F Muindi, Teoma Naccarato, John MacCallum, Garrett Laroy Johnson, Dulmini Perera, Zeynep Aksöz-Balzar, Mark Balzar, Galo Patricio Moncayo Asan, Satinder Gill and Vangelis Lympouridis

"Detourning" the notion of anticipation, the interdisciplinary and international collective Prototyping Social Forms (PSF) offers a series of workshops and a curated panel on enacting alternatives to what is presently the case so as to better imagine, sketch, inhabit and reflect on other ways of living in the world that may be obscured by present narratives. Supplementing techniques like world-building or trend-casting for extrapolating from the present to the future, we develop platforms, techniques, and technologies to make locally-generated skilled practices transportable and transformable, forming such knowledge into "germs" that can "sprout" in disparate learning and research environments. Rather than create recordings of some activity or finished products for exchange, these germs condense living processes that can metabolize into another suite of living processes that may grow quite differently under other conditions. Thus we supplement representation of "know-thats" with ways to disseminate and germinate know-hows, know-whys, and know-whens. PSF's work revolves around the practice of prototyping—the generation of models, or rather, germs, that can develop and grow in various ways and within different contexts, without assuming a fixed outcome. By focusing on the practice of prototyping, PSF attends to processes of development and their dynamics, as well as the limiting and enabling constraints of different "knowledge ecologies." Inspired by "seed banks" developed and maintained by horticulturalists and ecologists, the PSF Process Germ Bank is an experimental infrastructure for sharing germs of research-creation practices and for developing signature methods for probing and promoting diversity within different knowledge ecologies. Hybridizing metaphors, we offer a "seed ball" of process germs to try out in the terrain of the Anticipation Conference 2022 and stand ready to prepare conditions for embedding these process germs in the event with local organizers.

14:30-16:00

Open Dialogue: College of Global Futures Graduate Student Synthesis

Leah Friedman

This open dialogue session is designed to provide an opportunity for graduate students in ASU's College of Global Futures and elsewhere to reflect on the 2022 Anticipation Conference. During the session, we will reflect on the conference, synthesize takeaways, discuss what resonated, and plan for next steps to create a community around themes of anticipation and futures. We hope this will serve as a space to forge new connections, learn from each other, and lay out a path for future collaboration in this space. Graduate students from ASU's College of Global Futures are encouraged to attend, as well as any students from ASU and elsewhere that wish to reflect and plan together.