Karlsruhe Institute of Technology

YIN Insight 2018/2019

The strong network of junior professors and junior research group leaders at KIT

Young Investigator Network (YIN)

YIN Statistics 2018/2019

9.6 million of subsequent funding and
289 weekly teaching hours per semester

Scientific Highlights

12 ERC grantees among YIN members & alumni
BMWi, NEO Prize, and Neutrino Mass

Hot Topic

Being a Univerisity of Excellence once again –
KIT puts the Spotlight on Young Academics

Editorial

Dear Reader,

After having celebrated the first ten years of our Young Investigator Network, the last year continued to be at least as exciting. The first junior professors funded from the state and federal joint tenure-track program have started their activities at KIT and our university has regained its excellence status. KIT's successful run in the excellence strategy has a substantial impact on our network – attracting new talents to KIT and strengthening the support for our members. The greetings from the Minister of Science, Research, and the Arts of Baden-Württemberg highlight this recent development just as our Hot Topic Once again a University of Excellence – KIT puts the Spotlight on Young Academics. We, moreover, seize this opportunity to also have a look at the experiences of two former junior professors at KIT: Prof. Katharina Schratz and Dr. Jan-Philipp Weiß reflecting two major career options – academia and industry. We hope that these reports will serve as inspiration and motivation for other young scientists and research group leaders. Of course, we also present the traditional Facts and Figures section. It provides the annual update about the current situation at KIT concerning the YIN members, their scientific backgrounds, relevant tasks, and diversity. Not to be missed either are the highlights from our research and from the YIN advanced training program. In addition, we focus on another (maybe even more) important aspect in the lives of young investigators, junior professors, and research group leaders – the challenges of combining a career in science with starting a family. We are very happy that these insights have been provided by young mothers and fathers within YIN. And last but not least, we follow our Alumna in Portrait Prof. Rebecca Harrington around the globe, before we introduce new members and alumni, and let you know what we stand for.

In this regard, we wish you an enjoyable read and say 'Spotlight on (for) the young talents at KIT',
the PR Committee

Dr. Dominic Bresser Dr. Kathrin Valerius Dr. Aiko Voigt Dr. Karsten Woll

Contents

Dear Young Investigators,

The inclusion and importance of early career researchers has increased through every round of the Excellence Strategy, and rightly so. Therefore, I was particularly pleased when I saw KIT's proposal for the most recent round of Excellence Strategy funding and its strong focus on supporting young scientific talent. I think it is thus also no coincidence that KIT was selected this year as one of the eleven nationwide Universities of Excellence. Congratulations to KIT, as well as to the Young Investigator Network (YIN) on this tremendous, well-earned success!

Many early career researchers at KIT were involved in the preparation of the proposals and this competition showed that top-level research is only possible together with the strong promotion of young talent. Your discussions, suggestions, and visions for the future are crucial and play a central role in the development of KIT. We need to continue to use this energy! KIT provides outstanding opportunities for assuming leadership roles early in your career and has many initiatives such as the House of Young Scientists in addition to the YIN to support young researchers and attract the best talent.

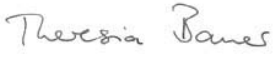
The top higher education institutions globally know that they need to attract the brightest researchers in order to remain nationally and internationally competitive. To keep up with the competition, we in Baden-Württemberg need to continue to offer stable employment conditions that also align scientific careers with opportunities for families. This is why we need to ensure that we offer early career researchers plannable, transparent and attractive options throughout their career.

It is clear that this element of providing reliable academic careers also served as a core part of KIT's successful proposal as a "University of Excellence." As part of this initiative, KIT's approach to establish a university-wide tenure track system to promote early career researchers has laid the foundation for scientific excellence.

In addition to its success in the Excellence Strategy, KIT was also successful in both rounds of funding under the federal and state program to promote additional tenure track professorships. The nine professorships won in 2017 were most recently complemented by six further tenure track professorships at KIT. This is yet another outstanding achievement for early career researchers at KIT and the institution as a whole.

The YIN at KIT plays a pivotal role for this group of highly ambitious tenure track professors and junior professors in addition to junior research group leaders. Networks such as the YIN ensure a smooth transition for new researchers joining KIT, in addition to representing their interests at the institution and supporting their personal growth at the university. Thanks to the YIN for all that you do and keep up the good work!

Theresia Bauer
Minister of Science, Research, and the Arts Baden-Württemberg



Theresia Bauer MdL
Minister of Science, Research, and the Arts
Baden-Württemberg

Being a University of Excellence once again –

KIT Excellent Tenure: a university-wide concept for reliable academic careers

The Karlsruhe Institute of Technology (KIT) was successful in the funding line "Universities of Excellence" of the Excellence Strategy competition launched by the German federal and state governments. For the next seven years, KIT will receive extra funds amounting to 105 million euro in total. Providing reliable academic careers is one of the major thrusts addressed by KIT's successful proposal. What does this mean for young investigators at KIT and the generations to come?

For independent junior research group leaders and junior professors, the measure KIT Excellent Tenure is by far the most intriguing. By offering tenure track towards full professorship, KIT plans to double the number of internationally recruited top-level junior research group leaders. Top-level, in this case, refers to prestigious, third-party-funded schemes, such as the Starting Grant by the European Research Council (ERC) or the Emmy Noether Group by the German Research Foundation (Deutsche Forschungsgemeinschaft). The concept sounds promising. However, how is it going to be reconciled with the research strategy of KIT and, especially, with the legislation in Baden-Württemberg?

KIT is one of 11 Universities of Excellence selected for funding by the Excellence Commission from a total of 19 proposals

Excellent Tenure and the University Law

According to the State University Law Baden-Württemberg (Landeshochschulgesetz, LHG), to qualify as junior professor, the phase of academic employment prior to and after the dissertation should not exceed six years in total.[1] Most external funding schemes for junior research groups, however, require a postdoc phase of at least two years and allow for up to seven years (e.g. ERC Starting Grant). In addition to working on average three and a half years[2] as research assistants writing their dissertation, top-level junior research group leaders usually have topped six years before they set up their groups. A dilemma? Not for KIT Excellent Tenure! By asking the state universities to come up with a quality assurance concept (comp. § 51b), the LHG grants them a measure of individual freedom. Hence, KIT introduced a half-time rule: In the first half of their funding period, junior research group leaders may still apply for a junior professorship at KIT.

Rejoicing at KIT after the official announcement of the selected Universities of Excellence. (Photo: Markus Breig, KIT)

This more flexible regulation allows KIT to appoint two types of junior professors: really young, promising candidates shortly after their PhD and more advanced junior scientists who have acquired external funding for a research group. Moreover, KIT has the chance to provide a prospect to the top-level junior scientists, who are already at KIT and one or two years into leading their externally funded groups. By tendering a junior professorshipo in the corresponding field, KIT can offer them a perspective and a strong basis to continue their research in Karlsruhe.

This is, however, where the concessions end: In addition to the external evaluation by the funding agency, the respective group leader will have to prove himself or herself once again in an international open call. While aiming to ensure the highest quality of the candidate, the process also takes a lot of time. Thus, it might happen that a top-level junior research group leader will rather accept a call from another university than go through the rather long processes at KIT with an uncertain outcome. The Bavarian university law, for example, allows for exceptions from placing an open call: in particular, for outstanding scientists whom the university has a special interest in attracting to strengthen its quality and profile as an institution or in agreement with their quality assuring concepts (cf. §18, (3)).[3] Given the present situation at KIT, most ERC grantees with temporary positions have left KIT for lack of perspective and took their grants with them (cf. page 7). Since 2013, seven out of nine had already been group leaders or junior professors in YIN before they received their ERC Grants. Hence, YIN members closely follow the first appointment procedures for group leaders under the new quality assurance concept from 2019 which are pendent at the moment.

State university laws in Germany allow different degrees of freedom

Attracting young talents

While in Baden-Württemberg attractive professorship positions are not tailored overnight, the universities can certainly foster their own young talents: With the Young Investigator Group Preparation Program (YIG Prep Pro), KIT targets excellent researchers up to four years after their PhD, ideally also attracting more international and female scientists. YIG Prep Pro fellows are provided with accompanying qualification, mentoring, and intensive support during the proposal writing phase. With this support, they are expected to succeed in the competition for external grants and double the number of funded young investigator groups starting each year at KIT. Among the participants are remote fellows who are yet to join KIT and those who get funding for a two-year postdoc stay including a budget for equipment and consumables. While the supporting network might be more closely knit for candidates on campus, certain funding schemes have the goal to bring excellent, international postdocs (back) to Germany. Therefore, it remains to be seen which of these two groups will have more success in acquiring the envisioned third-party funding and, thus, get access to the KIT Excellent Tenure Program.

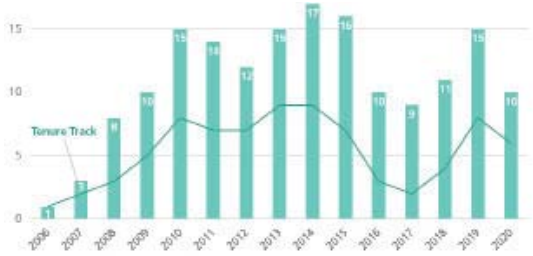
Excellent Tenure and the research strategy

Funding agencies decide on the basis of the quality of a research proposal. High quality, however, does not necessarily mean that a funded project matches the strategic focus of a university. The question of alignment is especially important for an institution like KIT with 38 percent of the total budget coming from third-party funds[4]. By combining an externally funded research group with the prospect for a junior or even a tenure-track professorship, the issue also affects teaching and personnel development at KIT. Hence, the question arises if KIT will support all proposals or put a limit to those in strategically remote research areas?

University of Excellence – YIN behind the scenes and on stage

YIN representatives were involved in the application process from the early stages on: starting with the kick-off workshops in May 2018 which addressed creative freedom for research, conditions for junior scientists, and the interaction with society. From this pool of ideas the KIT concept of *Living the Change* evolved over the months to come. In addition, YIN made it to the final application with its future concept and now profits from KIT being funded as a university of excellence. YIN contributed to the on-site evaluation in several roles: A mixed group of YIN members participated in a closed discussion round with the review committee that was specifically devoted to the needs and prospects of early-career researchers. Moreover, YIN was represented in the question session targeting Thrust C of the proposal which addresses KIT's measures in support of reliable academic careers. For all participants, it was a truly special experience to partake in this important evaluation process. An inspiring team spirit not only marked the "big event" but also showed in the joint efforts during the preparation phase. Through manifold discussions, meetings, and mock interviews, the scientific community at KIT grew closer together, ready to commit to common goals and actively shape the future at KIT.

[1] *Cf. www.landesrecht-bw.de/jportal/portal/t/d2p/page/bsbawueprod.psml/screen/JWPDFScreen/filename/HSchulG_BW*
[2] *On average, for Emmy Noether group leaders, the fuding decision is announced 3.9 yyear after their PhD examination. Cf. Table 5. www.dfg.de/download/pdf/dfg_im_profil/geschaeftsstelle/publikationen/studien/studie_karrierewege.pdf*
[3] *www.gesetze-bayern.de/Content/Document/BayHSchG*
[4] *Annual Report 2018 of KIT: www.kit.edu/downloads/jahresbericht_2018_en.pdf*



Approximate development of junior professorships with and without tenure at KIT since 2006. The data is compiled form the YIN data base and the annual reports of the University of Karlsruhe / KIT and might not be exhaustive.

As vice president for research Oliver Kraft states, for approving applications, scientific quality will be the only selection criterion. Furthermore, once the funding is secured, a suitable junior professorship position will be tendered for each top-level junior research group leader. Tenure track will be offered for all professorships that are in line with the long-term research strategy. At any rate, a junior professorship, with or without tenure option, offers more independence, international recognition, and visibility to young investigators. Making them regular members of the KIT departments, the status comes with full teaching and examination rights. Thus, KIT provides young group leaders with an excellent stepping stone on their career path towards a full professorship. YIN will closely observe how this concept will merge into practical life and is looking forward to welcome a new generation of top-level young investigators at KIT.

Junior professorship for all externally funded group leaders; tenure in line with the research strategy

Excursus: Junior professors at KIT

Since 2006, there have been about 34 junior professors with and without tenure at KIT - on average 11 present at any time. With the KIT Excellent Tenure, this number should significantly increase. Aiming towards an average of 10 new third-party funded young investigator groups per year, KIT plans to tender the same amount of junior professorships. Accordingly, their number should approach or even exceed the goal of 68 W1 positions set by the State Baden-Württemberg in the financial plan 2020/2021 (Staatshaushaltsplan)[5]. Although, the budget will mainly come from other sources. Against the fact that KIT wants to establish 100 additional full professorships within the next 10 years, there will be quite a few options for early appointments with tenure track. Since 2006, out of 24 junior professors, who by now have moved on to more advance positions, 42% had a tenure-track option. From the junior professors without tenure, 71% were appointed professor elsewhere, while 29% chose a successful business career. On the following page, two of them will provide insights into their career paths, their motives, and motivations.

From the junior professors without tenure track, 71% were appointed professor elsewhere

This graphic from the Funding Atlas 2018 of the German Research Foundation gives an idea how large funding agencies might influence the research profile of KIT. The funding volume (2014-16) is encoded in the font size of the individual research areas. www.dfg.de/sites/foerderatlas2018/hochschulansichten/karlsruhe_kit.html

[1] *Cf. www.statistik-bw.de/shp/2020-21 Universitäten und Klinika > 1417 Karlsruher Institut für Technologie (KIT)*

YIN members / alumni
KIT scientists who are not members of YIN

ERC STARTING GRANT

2019: Prof. Katharina Schratz
(Heriot-Watt University, UK, since 2019)
Low-regularity and high oscillations: numerical analysis and computation of dispersive evolution equations"

2018: Prof. Frank Schröder
(University Delaware, USA, since 2018)
Digital Radio Detectors for Galactic PeV Particles"

2017: Prof. Cornelia Lee-Thedieck
(University of Hannover since 2018)
BloodANDbone – conjoined twins in health and disease: bone marrow analogs for hematological and musculoskeletal diseases

2017: Prof. Lars Pastewka
(University of Freiburg since 2017)
Emergence of Surface Roughness in Shaping, Finishing and Wear Processes

2016: Prof. Corinna Hoose
Closure of the Cloud Phase

2013: Prof. Erin Koos
(University of Leuven since 2016)
Capillary Suspensions: A Novel Route for Versatile, Cost Efficient and Environmentally Friendly Material Design

2013: Dr. Pavel Levkin
DropletMicroarrays: Ultra High-Throughput Screening of Cells in 3D Microenvironments
2015 & 2017 Proof of Concept Grant each 150K€

2011: Prof. Christian Koos
Energy-Efficient Multi-Terabit/s Photonic Interconnects
2015 & 2016 Proof of Concept Grant each 150K€

2011: Prof. Alexander Nesterov-Müller
Combinatorial Patterning of Particles for High Density Peptide Arrays
2015 & 2017 Proof of Concept Grant each 150K€

2010: Prof. Peter Knippertz (not yet at KIT)
Desert Storms - Towards an Improved Representation of Meteorological Processes in Models of Mineral Dust Emission

2010: Dr. Matthias Schneider
Multi-platform remote Sensing of Isotopologues for investigating the Cycle of Atmospheric water

2009: Dr. Regina Hoffmann-Vogel (University of Konstanz since 2018)
Structural and Electronic Properties of Nanoscale Metallic Contacts Fabricated by Thermally Assisted electromigration

ERC CONSOLIDATOR GRANT

2018: Prof. Bastian Rapp
(University of Freiburg since 2018)
The Capillary Lock Actuator: A novel bistable microfluidic actuator for cost-effective high-density actuator arrays suitable for large-scale graphical tactile displays

2017: Dr. Christian Greiner
Deformation Mechanisms are the Key to Understanding and Tayloring Tribological Behaviour

2017: Prof. Christian Koos
Terahertz Waveform Synthesis and Analysis Using Hybrid Photonic - Electronic Circuits

2016: Prof. Martin Weides
(University of Glasgow since 2018)
Interfacing spin waves with superconducting quantum circuits for single magnon creation and detection

2016: Prof. Dennis Hofheinz
Preparing Cryptography for Modern Applications

2019
2018
2017
2016
2013
2011
2010
2009

ERC Grant – a welcome card to Europe

Katharina Schratz, former junior professor at KIT, is sought-after by European universities

Prof. Kathrina Schratz
Heriot-Watt University, UK

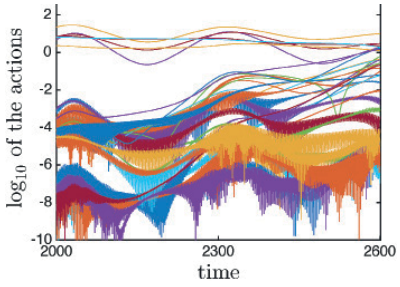
Katharina Schratz is the latest grantee on the list of YIN members and alumni funded by the European Research Council (ERC). Looking back on her career path from today, it seems to have come straight out of a picture book: PhD in Austria, postdoc in France, and just about one year later a junior professorship at KIT. Now at the end of her six-year-term, she secured an ERC Starting Grant as well as an associate professorship in the UK, and soon a full professorship in Paris – her city of choice. Within her ERC project LAHACODE, Schratz develops innovative numerical methods for nonlinear partial differential equations describing complex phenomena in nature and engineering. For the first time, these methods will enable reliable structure-preserving approximations to non-smooth problems.

Have you always wanted to be a professor?
I actually never thought about what I wanted to be when I was growing up. I decided to study physics in my last year of high school. However, after the first year, I changed to mathematics, because I became more passionate about mathematics as it seemed more "logical" to me. I liked my studies a lot, but honestly even during my studies I had no clue what I wanted to do later on with all that knowledge. A professor in Innsbruck – who later became my PhD supervisor and, most importantly, my mentor – asked me one day whether I wanted to write my master thesis with him. This was one of the best days in my academic life: I felt so honored and privileged. Later on I continued my PhD under his supervision and had such an excellent time that I was very motivated for a post doc stay in France. I think because of these extremely positive experiences with my PhD and post-doc advisor I ended up in research.

I stayed in academia because of my positive experiences with my PhD and postdoc advisors

Why pick KIT for your junior professorship?
I would say it is one of the occasions to be "at the right place at the right time". The junior professorship was a great opportunity back then. It allowed me to establish a small group with PhD and master students early on in my career. I learned a lot in that time!

Where was the idea born to apply for an ERC Starting Grant?
The ERC Starting Grant is brilliant as it allows you a lot of freedom as well as resources to establish a research group and to really push forward your ideas. In addition, ERC grants open up an unbelievable range of opportunities basically in any place in Europe. I myself had been very lucky to be a post-doctoral fellow in an ERC project. This made me realize how fantastic this grant is. It took me quite some time to work on my idea for the proposal. Consequently, I didn't publish anything for more than one year. Luckily, in the end it worked out well for me. The Research Office at KIT strongly supported me, and was very helpful in the whole process. But of course the scientific part is more important. I was incredibly lucky to have a wonderful colleague from Cambridge who guided and supported me. He even organized a mock interview which was tremendously helpful for the real interview. But most importantly, he believed in me and my idea.



Numerical resonance phenomena: Simulation of Fourier-modes of cubic Schrödinger equation. Resonant step sizes trigger artificial energy shift in the discretization and destroy the structure preservation given for the continuous problem. (Graphics: Katharina Schratz)

Without a tenure track, your time at KIT was coming to an end - were you sorry to leave?
For me becoming professor at Sorbonne University – starting in May 2020 – is like a dream coming true. It is one of the top places in mathematics, so who would not want to be there?

Are there any chances you might come back to Germany or even to KIT?
One should "never say never", but for the moment, I am very excited to work in Edinburgh and soon in Paris. I appreciate the atmosphere and the exceptional level of mathematics.

Was leaving academia ever an option?
There are many very interesting career paths in life besides academics. However, I like the specific freedom given in academics and up to now I never regretted my choice. Nevertheless, academia can be very tough, in particular, if no long term perspectives are offered to young researchers.

If you could change one thing in the academic environment, what would it be?
I am very happy in my current UK based academic environment. The concept of a permanent position with the possibility of being promoted at your own university is very appealing for me as a young(er) researcher: You may start as a lecturer or assistant professor to become a reader or associate professor, and eventually a full professor. It gives you ample opportunity of focusing on your research and publications instead of worrying about career path options.

A permanent position with the possibility of promotion allows you to focus solely on research

What do you want to achieve in the future?
I want to be happy.

Where do you see yourself in 10 years' time?
At Sorbonne Université!

Choosing an industry career in Sweden

Former JProf. Jan Philipp Weiß follows his passion for problem solving to industy

From 2008 to 2012 I held a position as junior professor at KIT. At the same time, I was leading the Shared Research Group „New Frontiers in High Performance Computing Exploiting Multicore and Coprocessor Technologies" with Hewlett-Packard (HP). In my group with two PhD candidates we were developing numerical methods for emerging hardware technologies and accelerators. With input from the HP Labs in the Silicone Valley, we have been working at the interface between hardware, computer science, and applied mathematics.

Combining academia and industry
My group had links to four different institutes at KIT. This came with a very fruitful environment but also with the need to meet a broad variety of interests. The interaction with the industry partner was mutually constructive and we had the full freedom to accomplish our research goals. I highly value the concept of a shared research group as it combines links to an industry partner with dedicated academic research. Special care might be needed when streamlining interdisciplinary aspects of the group and requirements of the industry partner with discipline-specific evaluation criteria for a junior professorship.

Dr. Jan-Philipp Weiß
Developer at COMSOL AB

While in academics you can typically adjust the underlying problem in order to demonstrate the advantages of new methods, a different approach is needed in industry-driven application scenarios. Some of the main requirements are accuracy, reliability, and robustness of the solutions. Specific problems are not yet solvable at all and require different modeling approaches or additional techniques. Hardware and software resources are always used at their limits. The time to solution is critical. To take on these challenges in an industrial context, I quit the academic career and started a position at COMSOL AB in Sweden where I have worked for five years as developer for finite element multi-physics simulation software.

While still working at the cutting edge of research in applied sciences, in industry, the focus is always 100% on problem solving

Working in industry

While still working at the cutting edge of research topics in applied mathematics and high performance computing, the focus is more on taking advantage of existing research work than on producing new research results. What I have learned in my interdisciplinary career at KIT is to understand the different languages of the different domain experts I'm working with. The big plus of the industry position is that 100 percent of the daily work is on the problem. However, there is only little freedom to contribute to the scientific community. As a developer, your business life is rather lonely. It's basically your problem and your project you are looking at for days, and weeks to months.

Since two years I'm holding a position as global expert for numerical solvers and HPC. Our worldwide users and customers are sharing their problems with me and I help them to adjust their models, the used methods, the software settings and I look at the hardware they are using. The goal typically is to improve the simulation efficiency and the quality of the results. Knowing the code, the software mechanisms, the mathematical methods, and the hardware and system aspects is highly beneficial. This is a quite diverse, challenging and thrilling task and I gain a lot of insight to what our industrial and academic users are doing in their day-to-day work and how these two worlds are apart due to different requirements. We take quite a huge effort to solve very specific problems of our customers and typically the expertise of several colleagues and experts is involved. The interaction with the customers helps us to create a highly capable and ever-growing product.

Jan-Philipp Weiß and his family are trying their best to visit all of the 24,000 islands around Stockholm. (Photo: private)

Moving to Sweden

For my family it was a great step to move to Sweden. It is fascinating to see how easy it is for kids to pick up a new language. We take great advantage of the family benefits in Sweden. We have received extra parental leave days for our imported kids. Basically you have 480 parental leave days per kid that can be spread over the week days in an 8 year period (which means that the partners can be off job for two years per kid). Parental leave can be taken out on an hourly basis without prior notice, giving maximum flexibility for a family. It is usually family first in Swedish business life. We are still surprised about the cultural differences between the two countries, in particular in habits and in social life. But is not Bullerbü in all aspects. We find ourselves much more open minded with these new experiences. It is great to see Germany from a new angle. Nature is unique in the Stockholm archipelago and we still have not seen all of the 24,000 islands – while trying our best.

It's a human, stupid – a computational perception-trace model based on human interaction

Prof. Achim Rettinger
Informatics

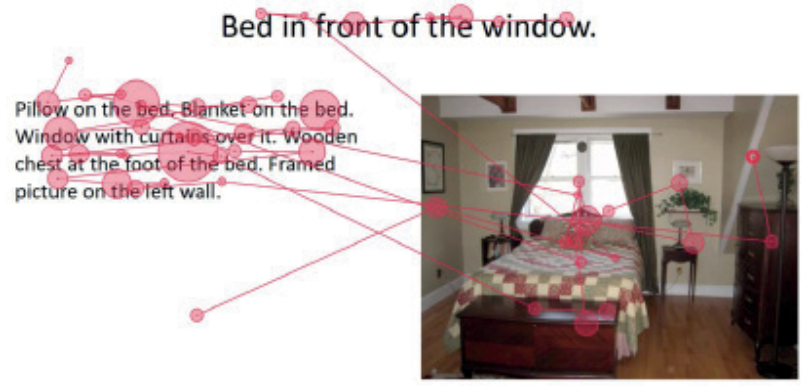
Representation learning techniques are key to the deep learning revolution of the last years. For instance, in Natural Language Processing (NLP), they encode the context of a word based on the surrounding words in the sentence. In computer vision, they capture visual traits from convolutions of image patches. And in network analysis, they encode the network structure of a node's neighborhood. Such learned representations, called embeddings, are typically represented as dense algebraic vectors and are the basis for the recent success in down-stream tasks and real-world applications: Even the standard keyword search by Google now uses contextual word embeddings.

While word embeddings are trained on huge collections of documents like web pages, they attempt to extract a contextualized representation solely from raw text data. The hypothesis we intended to test in this project is: Multimedia documents are made by humans for humans. Thus, to better represent their content for computers, they should be parsed in a human-like manner. For instance, when reading a multimedia webpage, (i) humans do not perceive all parts of a document equally: Some words and parts of images are skipped, others are revisited several times which makes the perception trace highly non-sequential; (ii) humans construct meaning from a document's content by shifting their attention between text and image, among other things, guided by layout and design elements.

Dr. Philipp Niemann
science communication

In this project we empirically investigated the difference between human perception and context heuristics of basic embedding models. We conducted eye-tracking experiments to capture the underlying characteristics of human perception of media documents containing a mixture of text and images. Based on that, we devised a prototypical computational perception-trace model.

We empirically evaluated how this model can improve a basic skip-gram embedding approach. Our results suggest, that even with a basic human-inspired computational perception model, there is a large potential for improving embeddings since such a model does inherently capture multiple modalities, as well as layout and design elements.



From a human perspective, it is a bed in front of a window. For computer vision, however, there is so much more... .

Bringing together simulation and experiment in lithography with lipids

PD Dr. Dr. Michael Hirtz
nanotechnology

Last year, we started our endeavor for a better understanding on the processes in writing phospholipid structures and how the resulting synthetic biomimetic membranes interact with and instruct cells. The YIN Grant enabled us to do piloting studies focusing on the writing process via dip-pen nanolithography with phospholipids (L-DPN) – the first step in modeling the full chain of processes from writing to cell-surface interaction.

Dr. Christian Brandl
material science

The generation of bioactive materials and interfaces usually involves highly interdisciplinary work. Here we engage in (i) physics for creating lipid membranes by dip-pen nanolithography (DPN) with phospholipids, (ii) material science for reconfiguring these membranes in liquid and incorporating signal protein structures, and (iii) biology to study the interaction of cells (on molecular level) with these structures.

For each step, there are still significant knowledge gaps concerning the exact mechanisms and processes which are not readily accessible with experiments. Here, computer simulations can help as "computational microscope" to shed light on the blind spots. Atomistic simulations allow to observe the underlying microscopic mechanisms, which, in turn, make it possible to formulate the design strategies for tailored and printed substrates.

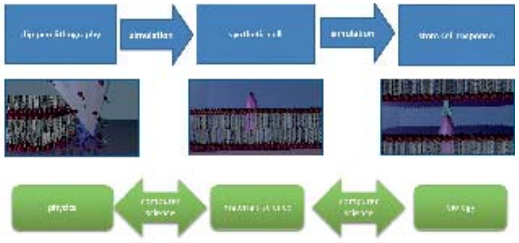


Fig.1.Steps involved in the generation and use of biomimetic lipid membranes and the envisioned information flow between processes.

We focused on writing complex molecules like the phospholipids via DPN: For the first time, we used a simulation including tip, meniscus and phospholipid molecules to catch a microscopic view on the membrane writing process. With the focus on atomic scale process-structure relation, coarse grained molecular dynamics visualized the migration of the lipids towards the substrate in a simplified DPN environment. First, the water-lipid interaction was simulated on a droplet wetted substrate, in order to separate the collective bilayer membrane formation from the lipid diffusion on water.

Prof. Dr. Cornelia Lee-Thedieck
cell biology

With the initial results from the grant period, we established simulation tools that can give first correlations between simulation and experiment.

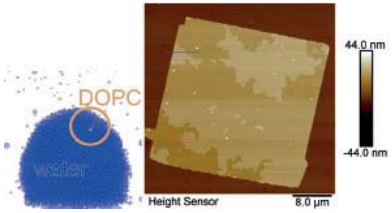


Fig.2. A simulation showing a phospholipid molecule (DOPC) in transfer on a water droplet (left) and an experimental outcome in form of a multilayer membrane stack (right).

Preliminary analysis gave already insights on the role of lipid hydration and concentration in the writing process that were previously not accessible and could only be speculated on. We are now about to expand our established simulation model to include the membrane self-organization as a second step in the overall structure formation. With the preliminary data, we already secured additional support, e.g. a guest stay funded by the Baden-Württemberg Foundation.

Utilizing 2D lattice defects to design novel reinforcements for nanocrystalline metals

Dr. Christian Brandl
materials science

Metals are still the primary material used in our society. They enable energy-efficient turbines and the miniaturization of electronic devices. New technologies also push the boundaries for material performance. As usual in life, all desired material properties cannot be optimized independently. The "strength-ductility dilemma", for example, hinders the application of ultra-strong materials, since the needed ductility is lost. For this YIN Grant, Karsten Woll and Christian Brandl combined experiments and simulations to deduce reinforcement strategies for metals: While the experiments focus on structural signatures created through solid-state transformation after annealing, the simulations allow to observe the underlying atomic mechanisms. Their results point to new materials design strategies where simulations reveal and validate process-structure-property relations and guide experiments.

Nanoscale reinforcements of brittle materials can resolve the strength-ductility dilemma. The concept relies on a size effect, where brittle materials become insensitive to initial flaws below a critical size. The key for this strategy is the reliable processing which results only in nanometer enforcements. Based on the control of the nucleation and growth of the hard compounds in a solid binary alloy, the material can be tuned by temperature protocol during annealing.

Multilayers are prototype materials to explore the potential of nanoscale precipitation in periodic stacking of dissimilar metals. The interfaces of the different metals as well as grain boundaries within the layers confine dislocation movement causing extraordinary strength. The detailed structure of grain boundaries also influences how precipitation of inter-metallic phases occurs in multilayers. It is not clear, however, what protocol to use to limit the precipitation to the nanometer scale to get a flaw insensitive and strong composite.

Dr. Karsten Woll
materials science

In initial experiments*, the chemical distribution of annealed multilayers (Fig. 1A-B) demonstrate that Nickel (Ni) intermixes with Aluminum (Al) and a product phase nucleates at the Al/Ni interfaces. Complementary molecular dynamics simulations allow to directly observe the atomic mass transport during the annealing at elevated temperatures. The processes of precipitate nucleation and growth are again related to the asymmetric diffusion of Ni into Al along existing and newly formed interfaces (Fig. 1C).

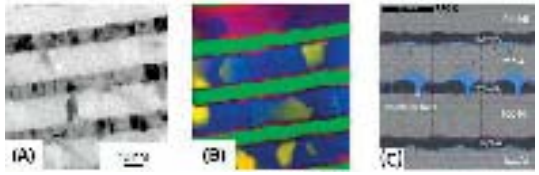


Fig.1: (A) Bright-field micrograph of the annealed Al/Ni multilayer. (B) The chemical distribution follows the colour code: yellow – pure Al; green – pure Ni; blue – Al-rich mixture of Al and Ni; red – intermetallic precipitate at the interface. (C) Atomistic simulation of the nucleation of an intermetallic phase.

An interfacial layer may shield the Ni layer. The growth of the inter-metallic NiAl layer, then, requires atoms diffusing from the Ni layer through the inter-metallic precipitate along grain boundaries to the Al layer. It is known from previous simulations that diffusion depends on the atomic structure of the grain boundary. Thus, controlling its population allows to control the diffusion and dictates the required temperature-time profile to determine shape and thickness of the precipitate. This work shows that solid-state interfaces guide the emergence of reinforcing inter-metallic phases. Their shape and size is controlled by diffusion at or along interfaces in Ni/Al multilayers.

*performed in collaboration with Xiaoke Mu from the group of Prof. Christian Kübel at the Institute of Nanotechnology, KIT

Facts and figures from 2018/19

The data was compiled from the YIN survey 2019 (35 participants) and the YIN database

Members

Shortly after the first Excellence Initiative, the number of YIN members fluctuated around 60 as shown in Fig. 1. Since 2014, the number of YIN members has slightly decreased as the KIT-internal groups funded by the Excellence Initiative have been concluded. The last one ran out in 2017. Since then, the number of YIN members has remained almost constant. The share of female YIN members has also stayed almost the same since 2017, with a relative proportion of women of near 30%.

Fig. 1: Number of YIN members and alumni from the foundation until the end of 2019 (YIN database, Oct. 2019)

YIN is an international network. 18% of our members have an international background, including members from Europe, America and Australia. This is a rise of 2% compared to the previous year. Before taking up their current positions, 38% of all YIN members have been abroad (Europe, North- and South America, Asia and Australia), 7% came from other German universities, 45% from KIT itself and 10% from industry (Fig. 2).

YIN members lead scientifically and financially independent junior research groups at KIT that consists of at least one other scientific staff member with at least a master's or diploma degree. This position or the group leader's position must have been acquired externally or internally in a competitive process (e.g. DFG own position or appointment procedure).

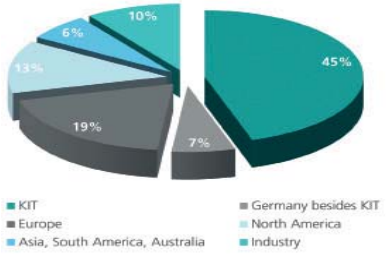


Fig. 2: Positions held by YIN members before starting their research group at KIT. (Data from survey 2019)

The average age of YIN members at the start of their junior research group is 33.5, with the youngest being 28 years old and the oldest 38. As the term of these groups is typically between four and six years, the average age of the current YIN members is 37, ranging from 31 to 45. Thus, it is not surprising that starting a family and aspiring the right balance between work and family are important topics. More than half of the YIN members have at least one child.

After concluding their junior research groups or junior professorships or leaving KIT, many former YIN members choose to become alumni. Their number is constantly growing and has reached 105 by the end of 2019. Last year six (former) YIN members have obtained a professorship, thus, raising the appointment ratio to 52% – counting 37 university professors, 5 professors at universities of applied sciences, 7 associate, 3 assistant, and 3 extraordinary professors.

Areas of research

YIN members cover four areas of research. In 2019, the majority of YIN members work in the field of engineering and material sciences (38%), followed by natural sciences (33%), computer science and mathematics (20%), and economics and humanities (10%) (see Fig. 3). Compared to the year before, the number of groups in the natural sciences has increased, whereas the number of groups in material sciences and computer science has receded.

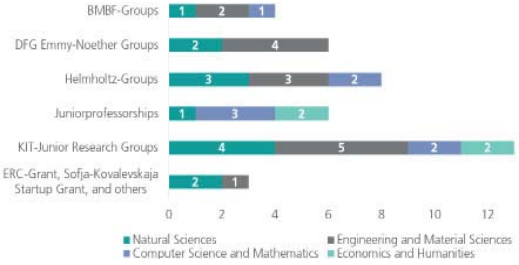


Fig. 3: Distribution of YIN research groups according to the funding program and areas of research (YIN database Oct 2019).

Types of YIN Research Groups

YIN unites a variety of group types and funding sources. In August 2019, YIN counted 13 KIT junior research groups. In addition, there were 8 YIN members leading a Helmholtz Young Investigator Group that are partially funded from the Helmholtz Initiating and Networking Fund and partly by KIT and their hosting Institutes.

There are also many YIN groups that are funded entirely from external sources such as the Federal Ministry of Education and Research (BMBF) (4) and the German Research Foundation (DFG) via its Emmy Noether Program (6). Finally, there are 6 junior professors who are members in YIN. Other YIN groups are funded by the state of Baden-Württemberg (Margarete von Wrangell Program), by the Humboldt Foundation (Sophia-Kovalevskaja Grant) and by the EU (Marie Curie Grant). An overview of the different funding programs is shown in Fig. 3 together with the area of expertise.

Initial Funding

Our survey shows that YIN research groups contribute a total of roughly 38 million euro, distributed over 3 to 6 years, towards research at KIT by their initial funding. This results in a contribution of about 9.5 million euro per year. The funding volume of the various groups varies between 20,000 euro and 4 million euro. Roughly 10.5 million come from KIT, whereas the remaining 27.5 million euro are externally funded.

Subsequent funding

In addition to the initial funding of their groups, YIN members acquire substantial subsequent funding. On average, each member raises roughly 276,000 euro extra a year. In 2018, subsequent funding accounted for 9.6 million euro in total. The majority, 78% of these grants, is provided by external funding agencies. 8% are contributed by KIT, and the remaining 14% by industrial partners.

Associate Fellow

The KIT Associate Fellow temporarily grants restricted teaching and examination rights. Thus, junior group leaders acquiring the status, may gain experience in independent teaching, supervision, and examination procedures. At some KIT departments, Associate Fellows can be first reviewers for their PhD, Master, and Bachelor students. At others, they may only serve as additional third reviewers for their PhD students but may not examine Bachelor or Master students. Despite these differences, the KIT Associate Fellow is a valuable instrument to recognize the structural and scientific independence of junior group leaders. In 2019, only two KIT departments have not yet appointed any Associate Fellows (Fig. 4).

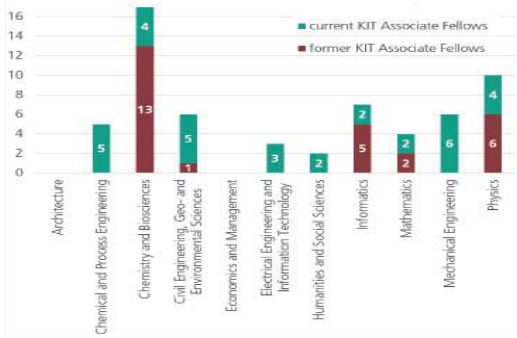


Fig. 4: Number of Associate Fellows at the KIT Departments in October 2019 (Data from YIN survey among the KIT Departments).

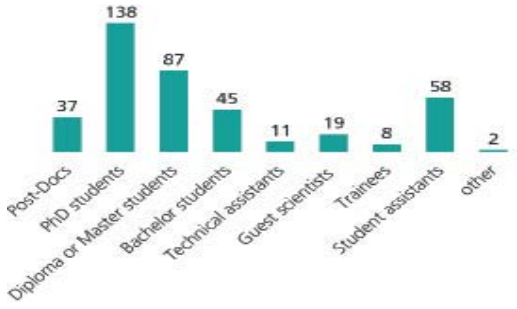


Fig. 5: Number of people working in YIN research groups.

Staff

The YIN research group leaders supervise for a large number of employees, namely a total of 405 people. The average size of a junior research group represented in YIN is 11 members. The YIN research group leaders employ 37 postdoctoral researchers, 138 doctoral candidates, 87 Diploma/Master students, 45 Bachelor students and 58 student assistants. The groups further employ 11 technicians, 19 guest scientists and 8 trainees, as shown in Fig. 5.

Among the doctoral and postdoctoral researchers within the YIN research groups, 53% originate from Germany. Hence, the groups are very international. Among the doctoral students and postdocs working in the groups, 15% come from Europe, 16% from Asia, 5% from North and Central America, 3% from Africa, 2% from South America, and 4% from Australia/ Oceania.

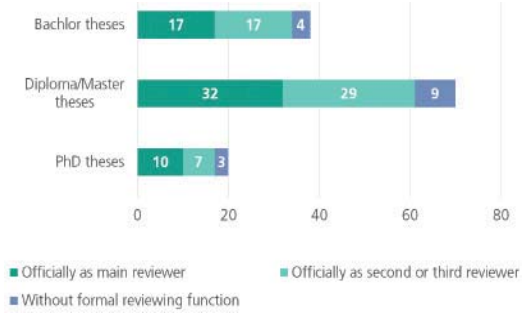


Fig. 6: Number of theses supervised by YIN members in 2018

Teaching and supervised theses

Although the majority of YIN members has no teaching obligation, for most of them teaching forms a substantial part of their activities. About 84% of all YIN members contribute actively towards teaching at KIT. The following numbers illustrate this. YIN members gave lectures accounting for a total of 289 semester credit hours (SWS) during the past winter (2018/19) and summer semester (2018). The 289 SWS comprised lectures (169 SWS), seminars (65 SWS), exercises (31 SWS) and practical trainings (24 SWS). Interestingly, however, only 31% of the YIN members have an obligatory teaching assignment. For 50% the teaching assignment is completely voluntary and mainly unpaid. (see Fig. 7).

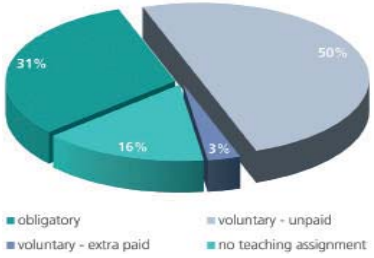


Fig. 7: Teaching assignment

In addition to teaching, YIN members supervise PhD as well as Master and Bachelor students. In 2018, 35 doctoral theses, 131 Diploma and Master theses as well as 72 Bachelor theses were prepared in YIN research groups, as is illustrated in Fig. 6. Unfortunately, the examination entitlement granted to YIN members is not the same across KIT Departments. Only 6 % of the YIN members have full examination rights. In contrast, almost 17 % of the YIN members have no examination entitlement at all. This is problematic given the fact that many of these YIN member at the same time teach independently. Roughly 39% of the YIN members have examination entitlement only for doctoral students; another 38% only for Bachelor / Master students (see Fig. 8).

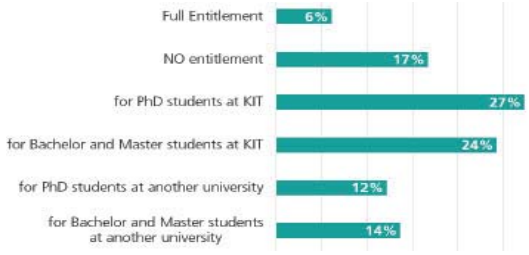


Fig. 8: YIN examination entitlement

Habilitation

The status of a junior group leader (Nachwuchsgruppenleiter mit Prüfungsberechtigung) was once thought to replace the habilitation. However, the significance of the habilitation versus a junior group leader position is perceived differently across disciplines, KIT departments, universities, and countries. In 2018, 43% of the YIN members planned to pursue a habilitation and 14% have already successfully completed this process. 29% were undecided and only 14% considered the habilitation unnecessary for their career.

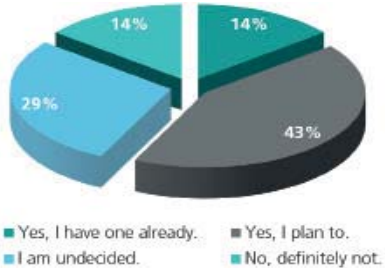


Fig. 9: Status and view regarding the habilitation as seen by YIN members.

Publications and conferences

A total number of 194 papers have been published in 2018 by the 35 YIN members that participated in this survey. This includes publications in prestigious journals such as Science, Nature, Nature Geoscience, Advanced Energy Materials and Progress in Photovoltaics. The average Hirsch-index of a YIN member is h = 17. Due to different publication traditions in different disciplines, the h-index of the YIN members varies significantly. In addition to publications, YIN members show their scientific work and represent KIT at numerous occasions. In 2018, they presented their work at 142 international conferences. Furthermore, 9 patent applications were filed by YIN members in 2018.

Distribution of Working Hours

Unsurprisingly, the time that young YIN group leaders spend on independent research and writing papers decreases as their duties expand. All YIN members have personnel responsibility and on average devote 22% of their time to supervising and mentoring, In addition, 16% of their time is spent for teaching, and 12% for grant writing, which are important building blocks for the careers of YIN members. Furthermore, administrative duties and committee work increase. These take 20% of their time on average.

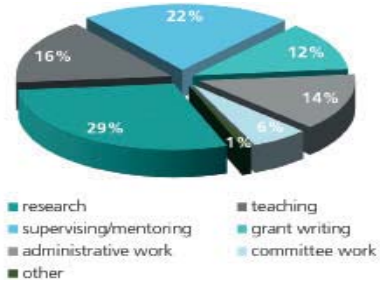


Fig. 10: Distribution of working hours of YIN members

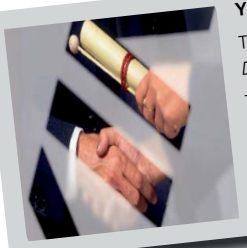
Amidst "Young Elite - top 40 under 40"

The business journal CAPITAL chose Kathrin Valerius as one of Germany's "Young Elite 2019" in the category science and society. Each year the honors go to the top 40 talents in Germany under the age of 40 in the categories: economy, politics, science, and society. All these promising young people have the potential to influence and shape the future of Germany. Kathrin Valerius searches for new physics beyond established theories at the intersection of astro- and particle physics. Her findings may well change mankind's understanding of physical connections. In November 2019, the awardees come together at the "Young Elite Summit" in Berlin to exchange ideas beyond their usual sphere of action and set new impulses for society.

Adolf-Mertens-Prize goes to Christian Greiner

Christian Greiner receives one of the three Adolf-Martens-Prizes 2018, presented by the president of the German Federal Institute for Materials Research and Testing (BAM). With the award, the Adolf-Martens Fond honors outstanding research of young scientists in material sciences and testing, analytical chemistry, safety technology and associated fields.

Christian Greiner leads the Emmy-Noether group "Materials Tribology" and, in 2017, obtained a Consolidator Grant from the European Research Council (ERC) for his project "Deformation Mechanisms are the Key to Understanding and Tayloring Tribological Behaviour".



YIN Grants 2019

The Geometry of Big-Data Clouds
Dr. Aiko Voigt and Prof. Dr. Petra Schwer

The role of meteorological variability imposed by weather regimes in energy systems dominated by wind and solar power
Dr. Christian Grams and Dr. Tom Brown

Monetary Policy Communication, Cognitive Abilities, and Expectations
Dr. Daniel Hoang

Joining forces with the German Society Junior professorship

YIN and the German Association for Assistant Professorships (DGJ) wish to work together more intensively in the future. The focus is on exchanges and cooperation to represent the interests of junior researchers and the support of alternative career paths to professorship. Many YIN members come from other universities or are appointed there. We are, therefore, particularly pleased to be able to join a nationwide peer community via the DGJ and to exchange experiences across the borders of the federal states. YIN members can now join the DGJ free of charge.

Found your "own" research journal

Dr. Dominic Bresser has become founding editor of the newly established *Journal of Power Sources Advances*. Being also published by Elsevier LTd., there is a closely collaboration with the well-known parent, the *Journal of Power Sources*. The newcomer stands out by its focus on communication-type articles and short research papers, its fast track review system as well as the gold open access standard. Its thematic focus lies on batteries, supercapacitors, fuel cells, photoelectrochemical cells, and nanomaterials for such devices. For Dominic Bresser the benefits are obvious: "Open access removes barriers to existing knowledge. Considering the general idea that scientific knowledge is to be shared to make it grow faster in a sustainable way, research results should ideally be available to everybody. Hence, I immediately agreed when getting the chance to serve as editor for the *Journal of Power Sources Advances*. In this role, I will also learn more about the publishing process and all aspects of scientific publications in general, which are an essential part of a researcher's work." (Comp. www.journals.elsevier.com/journal-of-power-sources-advances/news/interview-with-dr-dominic-bresser-editor-of-journal-of-power)

YIN Day with recent Alumnus and ERC Grantee Bastian Rapp

The 11th YIN anniversary started with a workshop on Digital Self-Marketing, followed by a working lunch with poster session. One Highlight was the YIN Lecture by YIN alumnus Bastian Rapp. Now professor at the University of Freiburg, he was recently awarded one of the prestigious Consolidator Grants of the European Research Council ERC. He spoke about Advanced Materials for Additive Manufacturing and 3D-printing in glass - for which he is particularly known since his Nature publication in 2017. An informal get-together afterwards encouraged networking.

Software contributions counting towards h-index

Offering full reproducibility and open source code, software contributions can be more beneficial to the scientific community than classical publications. However, they do not count towards impact metrics like the h-index. To instigate a change, software contributions could become acceptable as a full-value conference submission to be included in the proceedings after an additional independent review. In the blog Better Scientific Software, Hartwig Anzt argues that a community-based assessment would reduce the workload of the independent reviewer and ensure a very high quality. With his propositions, he is right in line with the "San Francisco Declaration on Research Assessment" (DORA): Its goal is to assess the quality and impact of scientific output by its own merits, rather than to rely on journal-based metrics. KIT has now joint the large circle of signatories.

NEO 2019: Augmented Reality in the OR

YIN member Franziska Mathis-Ullrich about the winning project HoloMed

HoloMed supports surgeons in the OR: The intelligent system generates a model from computer tomographies (CT) and maps out the deep-lying, invisible body structures. With the help of augmented reality glasses, HoloMed shows the precise guide channel and target area for surgical instruments. The Technology Region Karlsruhe awarded HoloMed with the NEO 2019 Innovation Prize in the field of artificial intelligence.

The winning team at the NEO awarding ceremony: Björn Hein (l.), Franziska Mathis-Ullrich (m.), and Christian Kunz (2nd from right). (Photo: Michael M. Roth, MicialMedia)

HoloMed focuses on punctures of the brain to remove accumulated liquid and reduce brain pressure. For instance, in cases of cerebral hemorrhage or strokes. In this context, where the target is not directly seen, the optimal point and direction of puncture is vital. "The system is to serve as an innovative, novel, and low-cost solution that directly enhances the quality of such interventions", says Prof. Björn Hein, who developed the technology together with Dr. Christian Kunz, and JProf. Franziska Mathis-Ullrich. Upon successful use for puncture, HoloMed is also planned to be expanded to other fields of medicine.

Franziska Mathis-Ullrich specializes in minimally-invasive medical robots as well as the translation of medical processes towards robot- and KI-assisted surgeries. As CEO and co-founder of the startup company Ophthorobotics, she played an essential part in developing the first system worldwide that automatically injects medication into the eye for the safe and efficient treatment of chronic ocular diseases.

Franziska, what motivated you to join the HoloMed team after coming to KIT in 2019?
The project was already ongoing. However, when my new colleagues told me about the idea, I was immediately convinced about the impact, augmented reality may have on the current standard of care in neurosurgery and other medical fields. CT data are available prior to an emergency procedure. HoloMed allows to make these data useful and intuitively interpretable to a surgeon.

Which expertise did you bring in?
Upon my arrival, many of the individual components of the HoloMed system had been developed by Prof. Björn Hein and Christian Kunz within a BMBF project. However, all parts needed to be integrated into a larger framework under consideration of the clinical need. This is where I came in. The experience I gained as CEO of a medical robotics startup provides us with an understanding of the strategic challenges lying ahead during the adaption of our system towards frequent usage in the clinical practice.

Which was or is the most difficult part?
As for many well-designed and technologically sound medical inventions, a challenging process is the translation of such a system into the clinical reality. Only if the technology is well-adapted by clinicians and fits into the surgical work flow, it will find its way into clinical use. Thus, In collaboration with the University Hospital Ulm/Günzburg, we are currently evaluating the system's usability in a real clinical environment on a customized head-phantom.

What scientific challenges lie ahead?
We need to consider the influence of motion of brain tissue during a neurosurgical procedure on the precision of the intervention. At the moment, the very fast work-flow minimizes changes through brain shift. Additionally, we will add further automation capabilities to the system to robotically guide a surgeon's hand during critical surgical steps and achieve higher precision than during the manual operation.

New limit for Neutrino Mass below 1.1 eV

Kathrin Valerius has coordinated the KATRIN analysis activities at KIT since 2014

The international Karlsruhe Tritium Neutrino Experiment (KATRIN) has improved the upper limit of the neutrino mass by almost a factor of 2. Based on a purely kinematic method, KATRIN has narrowed down the absolute mass of neutrinos to less than 1.1 electron-volt (eV) at 90% confidence after just a four week measurement campaign. After 1,000 days of data taking, an even higher sensitivity of 0.2 eV will be reached. Prof. Kathrin Valerius, most recent YIN alumna and former speaker of the network, coordinates the analysis activities at KIT. Overall 20 institutions from 7 countries are part of the KATRIN collaboration.

Apart from photons, the fundamental quanta of light, neutrinos are the most abundant elementary particles in the universe. They are by far the lightest species and very rarely interact with surrounding matter. Nonetheless, they are considered "cosmic architects". The exact role neutrinos play in shaping the large-scale structures in our universe depends on their rest mass, which is unknown at present. In the world of elementary particles, their small but non-zero mass points to new physics beyond established theories.

KATRIN's current result builds upon years of effort. The experiment makes use of a fundamental principle in the beta decay process of tritium: Here, the electron and its neutral, undetected partner, the (electron- or anti-)neutrino, statistically share the available decay energy of 18.6 keV. In extremely rare cases, the electron effectively obtains the entire decay energy, while the neutrino is left with almost no energy. Following Einstein's famous formula $E = mc^2$, the minimum amount of energy is attributed to the neutrino's rest mass.

As is customary in today's precision experiments, vital information required to complete the analysis of the measured beta-decay spectrum was veiled until the very last step in order to prevent an unintentional "observer's bias". To specialists the process is known as "blinding." By late evening in July 18th, 2019, the uncertainties were finalized and the spectral models were unblinded. As a result, the analysis programs simultaneously performed overnight fits to search for the tell-tale signature of a massive neutrino. The following morning, all three groups announced identical results, which limit the absolute mass of neutrinos to a value of less than 1.1 electron-volt (eV) at 90% confidence. Thus, half a million of the neutrinos weigh less than one electron, the second lightest elementary particle.

The work of Kathrin Valerius and her team has contributed to this success: As head of a Helmholtz young investigator group dedicated to the analysis of KATRIN data, she has coordinated the analysis activities at KIT since 2014. Now, Kathrin Valerius has, moreover, secured a Helmholtz professorship at KIT in the line "Funding of first-time appointments of excellent female scientists (W2/W3)". Thus, she will continue the hunt for the neutrino mass with more data to be collected by KATRIN. In addition, she will commit herself to another big puzzle of astroparticle physics: the nature of Dark Matter which makes up the largest part of all matter in our Universe.

Kathrin Valerius (m.) and her group at the KATRIN site on KIT Campus North. The team is dedicated to the analysis of KATRIN data and the search for new physics beyond the standard model. (Photo: Markus Breig, KIT)

What it takes to secure a BMWi grant

Ulrich Paetzold about funding from the Federal Ministry of Economic Affairs and Energy

Perovskite-based tandem solar cells promise to boost the efficiency of established solar cell technologies beyond 33%. They combine two light harvesting semiconductors that are each optimized for a different range of the solar spectrum. In the CAPITANO project, researchers want to advance this new technology by combining thin-film solar cells based on perovskite semiconductors with semiconductors made of copper, indium, gallium, and selenium (CIGS). The Federal Ministry of Economic Affairs and Energy (BMWi) funds the consortium with 5.2 million euro – 2.1 million go to KIT. Partners are the Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (ZSW), coordinating the project, and the Schwäbisch Hall-based enterprise NICE Solar Energy, which will assess industrial scale production and costs. Dr. Ulrich Paetzold, lead principle investor at KIT, reveals what it takes in his experience to get funded by the BMWi.

Members of the Perovskite Photovoltaic Taskforce at KIT in their core lab. (Photo: Markus Breig, KIT)

What is special about applying at the BMWi?
The BMWi particularly supports research that has a high technology readiness level (TRL) or can be lifted to such a level during the project. So, it can't be fundamental research, but needs to be research with a high relevance for application in a field of strategic relevance set by the BMWi. They fund proposals submitted to a framework program on certain topics that is open for an extended period – for us it was the 7th Energy Research Program which is dedicated towards novel environmentally-friendly, reliable and affordable energy supply. You can submit any time, but the main evaluation round only takes place once a year – usually in the end of September.

When was the research idea born?
The idea was born around 4 years ago at an internal team-days-events of the Light Technology Institute (LTI) at KIT. At that time, I was about to join the Institute of Microstructure Technology at KIT and, therefore, was invited. There, I met my collaboration partners from the ZSW with whom it is a pleasure to work also beyond this project. We came up with the idea to combine a perovskite top solar cell with a CIGS bottom solar cell. We made a module as a first experiment and turned it into a paper. After that it was pretty clear that this technology had great potential and it strategically fits. To stand a chance for a BMWi grant, you also need very strong support from various companies and/or industries. They usually don't fund single players – it is always a consortium.

The BMWi usually doesn't fund single players – it is always a consortium

How did you find the right partners?
We all branched out to use our networks: We collected several letters of support, and clustered them in a strategic way: So, we got material companies on board, mechanical engineering companies, which are producing tools for photovoltaics, and our main partner NICE Solar Energy, who is actually making photovoltaics. It is also important to accommodate the wishes of the companies into your project proposal. You cannot say, this is my idea, I only do this. Furthermore, you need to address the companies' interests such as cost-of-ownership calculations, energy yield predictions, and the testing of specific materials or processes in the context of the project.

Being a scientist and a parent

For young investigator group leaders, the time of building a research group is often also the time of building a family. This double excitement comes with potential for double stress. How shall one balance work with the new responsibilities at home? How does the academia-family juggle transform one's everyday work and approach of leading a research group? How do peers and colleagues respond? Three YIN members kindly share their experience and lessons learned regarding these and other questions.

In 1.5 years back to full-time
When my first child was born, I had projects running and could not afford to not be working for a longer time. Hence, I only took a few months of full-time leave before coming back part-time. My husband supported this strongly by taking full-time and part-time parental leave. We were also in the lucky situation that my mom supported us tremendously by taking care of the baby during two days per week and later also during work related travels.

I also experienced my colleagues at KIT-Campus Alpin to be very supportive. They allowed for enough flexibility to combine work and parent duties. Still, supervising my group and structuring my work day was challenging: I concentrated very much on the work that needed to be done and had less time for coffee breaks and other social activities with colleagues. I was awarded an Emmy Noether research group by the DFG when I was pregnant with my second child and was able to postpone the start of the group by a year. The first 1.5 years I headed the research group in part-time, which was fine but also very demanding. Besides, there were conferences to attend, collaborations to maintain, and even teaching responsibilities.

I postponed the start of my research group by a year and worked the first 1.5 years in part-time.

To master all this was only possible because my husband took over a great load of responsibility for the baby and supported me. For instance, we often traveled together to conferences taking the baby with us and sharing the duties. As we both worked part-time at the same institute we could also spontaneously re-arrange our schedule to attend meetings.

Dr. Nadine Rühr
DFG Emmy Noether Group
married, 2 children

Being a scientist and a parent is demanding, but also a lot of fun. Make sure you have a good network of support from family, friends and daycare facilities close to your work environment. For instance, when traveling with the baby to conferences overseas: colleagues typically like to have a little chat with you over the baby, which helps you to get to know other scientists better. You just have to find out what works best for you.

Being a parent also changes how you perceive the world around you. You become very structured, set priorities more easily, and try to become as efficient as possible during work time. This has advantages but also may have disadvantages because colleagues or group members might feel they don't get the attention they deserve. It helps to talk to them and explain your situation.

All in all, I think there is no golden standard on how long parents should take parental leave. I think there should be enough flexibility to try and find out what works best for the kids and the parents. I also think that all funding agencies, scientific metrics and committees should respect parents to take time off to care for their children. I explicitly say parents here because it should be common that fathers take their responsibilities as well and this should be supported by the culture at KIT.

Dr. Benjamin Häfner
KIT JRG
married, 1 child

Two times a month

With regard to the birth of our son in 2019, I had two months of parental leave: one in the first month of his life, the second about four months later. The main drivers were to spend dedicated time with my son during his first year of life to really "get to know him" from the beginning. I also wanted to relieve and better support my wife, who is on parental leave form her job as a teacher for an entire year. At KIT, I am leading two research groups with 17 research associates (all doctoral students) in total. They as well as my professor supported my parental leave and really had a positive perception of it. A few members of my groups had been on parental leave before. So there was some experience on how to handle things.

Reflecting my two parental leaves today, everything turned out quite smoothly, as the two months were rather short and separate from each other. Regarding the organization of the research groups, it generally felt like leaving for two longer periods of holiday. As for those, of course, it is important to plan in advance manifold organizational tasks and duties, such as substitutions at project meetings or the signing of documents. The time of parental leave was most challenging at the beginning of the first month: Our son was born three weeks before the expected date all too suddenly, right before the Easter holidays. So everybody in my groups was surprised when I was suddenly gone. Especially, as just a week later, I was supposed to give the first lecture of a newly created laboratory course, for which I am the responsible lecturer. Thus, very instantly a colleague had to substitute me.

An open communication and detailed planning in advance are most crucial

During my parental leaves, I was not at KIT at all, except for a few hours one day regarding an important project meeting. However, I was constantly reading my emails to prevent myself from having a very large amount of emails waiting at my return – I also do so during holiday leaves. Nonetheless, I communicated in advance that my groups should not rely on me answering, and take over responsibility by themselves. Consequently, I only replied in cases that were very important from my point of view. Yet, a few associates gave me the feedback that for them it was sometimes confusing when I nevertheless replied and proposed to me to just consequently take time off. From my point of view, though, it still was a good decision to provide my support where I could do so easily without much time effort and, thereby, prevent misunderstandings.

Due to the short time of parental leave and keeping up with emails, my reintegration was very easy and fast. What I changed in my everyday life after the birth of our child is to come home from work a little earlier in the evening to be able to spend time with our son. If necessary, I compensate this by finishing work later at night. For the time, after the first year, I applied for the KIT KITAs. However, the current status of my inquiry is still pending. Altogether, I am mostly satisfied with my parental leave. It was a really good decision for my family and me. With regard to my research groups, I think it definitely was an advantage to split up the two months. Most crucial, however, are an open communication and detailed planning with the team in advance.

Dr. Luise Kärger
Vector Foundation YIG
married, 2 children

In nine years back to full-time work

The question of balancing research and family arises at the beginning of many scientists' careers. Especially when both partners are professionally ambitious and when grandparents live far away, it is not easy to find a suitable solution. My husband was working in Karlsruhe and I was working in Braunschweig when we were expecting our first child. I had completed my doctorate and was working as a tenured scientist and project leader at the German Aerospace Centre (DLR) in Braunschweig. But with the birth of our child, it was no question for me to take a year of parental leave and live in Karlsruhe with my family. Nonetheless, I could not quite let go of research completely and chose to work 20% part-time for one year. Thankfully, the head of the DLR institute in Braunschweig offered me to work from home in Karlsruhe. I am more than grateful that this exceptional solution was possible.

A success model for parents: phased part-time work with partial home office

Due to the known number of months before giving birth, there was sufficient time to prepare for my absence. I was able to hand over tasks to colleagues, pre-prepare a few significant upcoming project tasks and inform the project partners. In this way, the shift of responsibilities worked reasonably well. During the first six months after the birth of our daughter, I could well use her sleeping periods to work for an European project to a small extent and to be available via email and phone for my colleagues and project partners. After seven months, my daughter spent two mornings per week with a day-care mother. It was a new situation for both of us, but extended our freedom and horizon. My daughter got to know a lovely day-care mother and two older day-care sisters. Meanwhile, I could concentrate on my work and was much happier afterwards to spend time with my child. A win-win solution.

When my girl turned one year of age, she got a place in childcare. Thus, I was able to increase my part-time work to 50%. My husband took two months of parental leave to ease my start into the half-time work and to take care of our daughter and her settling in at childcare. From that time on, I traveled to Braunschweig and worked there for three days per month, while my husband took care of our daughter. As for the rest of the part-time work, I was again allowed to work from home in Karlsruhe. It was an exceptionally good situation for having a family in Karlsruhe and a 50% job in Braunschweig. However, the distance was of course not advantageous for scientific exchange, for supervision of master or doctoral students, and for project coordination. Nevertheless, I could use the time for my own research, for more involvement in the European project, for paper reviews, for acquisition of a new European project, and for some long-distance supervision to assist a doctoral student of mine in another project.

Just before our daughter turned two, she got a little brother. Since we had made good experience with the 20% and later 50% part-time model, we decided to do the same again. When it became clear that we would stay in Karlsruhe, I looked for a new position here. It was good fortune that at KIT a new chair for Lightweight Technology had been established. The professor was an expert in processing of polymer composites, and he was looking for an experienced scientist in composite simulation. So, it was an easy decision for me to take the offered postdoc position and to start coordinating an exciting large-scale project at KIT. At that time, our son was one year and a half, and he had settled in well at childcare.

I started my new position with a 60% part-time employment to have sufficient time for our two kids. I am grateful that my new boss at KIT again gave me a lot of freedom and allowed me to work some hours from home. This made it easier to spend more time with the children and advance my work when they slept. In the years that followed, I could successively increase my responsibilities. I successfully applied for a Young Investigator Group and supervised more and more doctoral students. With the growing responsibilities and the growing age of our children, I could also increase my part-time employment from 60%, to 75%, to 90%, and, finally, to 100%, when the kids were seven and nine years old.

Looking back I am rather happy with the way things have developed, and I would probably do the same again. However, for a steep scientific career, it is certainly not the best strategy to work part-time for such a long time. Nevertheless, I would not have wanted to miss any more time with the kids. Now that they are getting older and more independent, I still have enough time to make progress in research and enhance my topics and collaborations.

Continually towards Leadership Excellence

Insights from the tailor-made advanced training program exclusivly for YIN members

Negotiating Confidently
by Dr. Axel Loewe, KIT JRG

At first sight, young investigators might not need to negotiate often in their daily lifes as heads of a junior research group. Nevertheless, 10 YIN members signed up for this workshop and gathered at the "räume" venue in the middle of the Hardtwald, just outside of KIT campus south for a one day workshop in April 2019. In this part of the YIN educational program, Udo Kempkes introduced basic concepts for successful negotiations ranging from cooperativity to escalation. We explored the Harvard concept for collarborative conduct of negotiations during several interactive role plays. By putting the theoretical frameworks into action and discussing the results, we could easily relate them to challenging situations everyone of us had experienced previously. Reflecting own experiences and action strategies and discussing them within the peer group of fellow YIN members in different settings was most valuable for most of us.

We also learned about tangible tools to influence specific phases of negotiations and to resolve conflicts. By continuously referring to practical examples and reflecting real-life situations, we became aware that negotiations and conflicts of various kinds are something we have to deal with basically every single day. Sometimes small and easy, sometimes big and convoluted. The YIN workshop "Negotiating Confidently" made us realize how we used to negotiate and provided concrete and tailored input where me might not use existing potentials to the fullest.

Leading through feedback
by Dr. Aiko Voigt, BMBF group

Being a leader entails being an enabler: enabling others to bring out the best in them. Letting people know when things are working – and when they are not - is key to this. Yet, giving feedback can be challenging, as it is quite different from a normal scientific conversation. The workshop "Leading through Feedback" covered theoretical background, practical recipes and hands-on training on how to effectively provide feedback. By means of various role plays the hands-on training addressed actual – but of course anonymized - examples from the research groups of the eight participants.

We jumped right into the topic and started the day with a mock interview: one of the participants took on the role of a group leader, and a second one the role of a student having trouble with his/her work. The other participants observed the interview, and the "student" and the larger group then gave feedback to the "group leader". This feedback proved quite insightful, and was used in several repetitions of the mock interview. We then discussed the importance of providing feedback in the context of everyday work (not just as part of annual review meetings), and in a constructive and specific manner that emphasizes the search for solutions without offering, or directing, them. We also learned a four-step guideline for a brief feedback conversation that we tried out in groups of two. The workshop was held in the "räume" seminar rooms located in the Hardtwald north of the Karlsruhe Palace. This provided a focused and quiet setting away from the everyday hectic of campus, including a stroll through the forest after lunch that allowed for additional discussion and exchange.

YIN Certificate *Academic Leadership*

After various seminars, workshops, and coaching – mounting up to 200 academic units – Dr. Frederik Zanger has proven himself as exceptional leader personality. At the YIN Day 2019, he was awarded the Certificate *Academic Leadership*. "In my daily work, I greatly benefit from the knowledge and practical training I acquired", says Dr. Frederik Zanger. And, his daily work is no longer exclusively at KIT. Since October 2019, he has a KIT Industry Fellowship in cooperation with Edelstahl Rosswag. While leading the shared research group *Additive Manufacturing*, he has also become head of Mechanical Finishing at Rosswag. All in all, it is a great new challenge, in which the issue of managing different employees is an essential task.

Rights and Duties of Junior Professors and Junior Research Group Leaders
by Dr. Daniel Hoang, KIT-JRG

What are the legal duties, rights, and responsibilities of KIT junior research group leaders? How do they differ from those of junior professors? The answers to these questions are frequently not obvious and sometimes not even known to us in all relevant aspects. This workshop is designed to fill this gap and was held for the first time in 2019.

Two experts from the German Association of University Professors and Lecturers (Deutscher Hochschulverband, DHV) thoroughly addressed all aspects in the areas of research, teaching, and innovation. For instance, did you know that our "rights" in research and teaching are quite strong and protected by the academic freedom as written down in the German Constitution ("Wissenschaftsfreiheit", "Freiheit von Wissenschaft, Forschung und Lehre")?
These rights include publishing results without prior approval but also the intellectual property ownership of the outputs from independent academic research.
Did you know that there are also "Duties" beyond teaching obligations? For instance, in KIT's self-governance bodies and as supervisor of Ph.D. students?

The tenure clock is ticking. Therefore, knowing the rights and responsibilities is a big asset to better navigate through faculties and administration on the path to a permanent position. The workshop also helps tremendously to better understand subtle legal differences between the statuses of "KIT-JRG leader", "JProf", and "Permanent Professor". This workshop should (continue to) be at the heart of the YIN educational program. I highly recommend this workshop to every YIN member.

Around the globe towards scientific independence, tenure track, and professorship

An interview with YIN alumna Rebecca Harrington, professor for hydrogeomechanics at the Ruhr University Bochum (RUB)

Prof. Rebecca Harrington
Ruhr University Bochum

Rebecca Harrington is quite a globetrotter: Born in the United States of America, she did her PhD in Los Angeles, was postdoc and leader of a young investigator group at KIT (2009-2013). She then moved to Canada ro become an assistant professor, before she finally, in 2017, accepted a full professorship in Bochum. At the Institute for Geology, Minerology, and Geophysics, she uses observational approaches to study how fluid-rock-interactions affect induced seismicity as well as the sources of natural earthquakes and other seismic signals such as non-volcanic tremor, very-low-frequency earthquakes, and volcanic hybrid earthquakes.

Why did you chose to come to Germany in the first place and why to return once more?
During the course of my PhD, I realized that I wanted to pursue a career path in academia. In the US, that requires one to be mobile. It was actually not on my radar to come to Germany after my PhD, but it just so happened that when I met my (German) husband, who is also an academic, we both found postdocs in Germany following our PhDs. We went to McGill University in Montreal following our postdoc positions in Germany to pursue two tenure track positions, as our positions in Germany at the time were not permanent. It was just coninicidence that both of our current positions were advertised here in Germany at roughly the same time, so we decided to give it a shot and submit an application package in both cases. The main reason we returned is because we were made two attractive offers. We were also happy to be closer to my husband's family (which is much more extended than mine).

To Canada for a tenure-track position

Why did you choose KIT for your postdoc?
I was lucky to have met Prof. Friedemann Wenzel, who first offered me a position in Karlsruhe, who allowed me the freedom to pursue my own research and to support me in writing proposals for both my Alexander von Humboldt and YIG applications. He was also key in supporting me building a research and collaboration network in Germany. The opportunity provided me research freedom flexibility to pursue my interests.

You led one of the first KIT Young Investigator Groups (YIGs). Did you like the concept?
I am a strong supporter of the North American tenure track system, which offers the financial independence for young academics to develop their research program and working groups. The YIG format affords young researchers similar opportunities, and is a great start to providing the necessary infrastructure to allow people to purse an academic career. The only main drawback is that there is no transparent path to tenure. I left KIT because McGill University made me a tenure track offer in an exciting, dynamic department (Earth and Planetary Sciences). In North America, tenure track offers imply that the position becomes permanent following a successful tenure review, so the offer provided a clear path to a tenured professorship.

Retrospective: Rebecca Harrington (m.) with her Young Investigator Group at KIT in 2012. (Photo: Markus Breig, KIT)

How was your YIG valued in Canada?
I would say that I was evaluated more on what the YIG enabled me to do, i.e., advise MSc and PhD students, lead a research project (that included a field deployment of seismometers), and apply for various sources of external funding. All of the above activities provide a signal to a hiring committee that a person is able to do the things that one needs to do as a tenured professor, and that was key to being made a tenure track offer.

How does it compare to a junior professorship in Germany?
There are many similarities in the structure, but from the few anecdotal examples that I am aware of for junior professorships in Germany (which can of course vary from university to university), the two main differences are that in North America the basic funds (Grundausstattung) can be more generous and that tenure follows after a successful tenure review (i.e., the "Hülse" or the funding is there in the case of a successful tenure review). In the cases of junior professorships in Germany that are not tenure-track, what I have observed is that the junior professors are not as integrated into the faculty, perhaps due to the fact that they are regarded as temporary positions. For the few junior professorships that I have seen that are tenure-track, the positions seem in most cases indistinguishable to assistant professor positions.

Without tenure track, junior professors are often less integrated into the faculty

After Canada, you came back to Germany – could it also have been back to KIT?
Having a "dual career" situation in my family required us to be a bit open as to where we ended up, but we knew we wanted to stay in either North America or in a German speaking country. I did, in fact, interview at KIT as well around the same time that I interviewed at the RUB, but was not offered the position.

Was an academic career the only option?
I received a job offer from Exxon as a postdoc and considered it seriously, but due to dual career considerations, didn't end up accepting it. In the end, I am happy to have the freedom to work on what I would like, so I certainly don't regret my decision, but the higher salary was tempting.

If you could change one thing in your academic environment, what would it be?
To improve the gender balance (particularly in STEM fields) at all levels of academia in Germany, but especially at the tenured professor level.

What are your goals for the future?
Aside from my research goals, I'd like to cultivate a cohesive, dynamic earth sciences department here at the RUB. We have a diverse research and teaching profile, and I especially enjoy having many disciplines such as Geophysics, Petrology, Rock Mechanics, and Mineralogy together in one Institute. We are going through a sort of "changing of the guard", as we have a series of retirements which started with my arrival. I am looking forward to being part of the next generation and continuing to build on our diversity with my existing and new colleagues.

Where do you see yourself in 10 years?
Right here at the RUB, working with my new colleagues, my enthusiastic students!

Rebecca Harrington on a field-based teaching course in Carboneras, Spain, probing the shallow subsurface structure with her students. (Photo: Kilian Kemna, RUB)

New YIN MEMBERS

Dr. Claudia Bizzarri
Institute of Organic Chemistry

KIT-Junior Research Group
Photoactive coordination metal complexes for artificial photosynthesis and bio-imaging

Dr. Benjamin Häfner
wbk Institute of Production Science

KIT-Junior Research Group
Agile Production Control Cycles

Dr. Alexander Hinz
Institute for Inorganic Chemistry

KIT-Junior Research Group
Synthetic molecular inorganic chemistry

JProf. Xian Liao
Institute of Analysis

Juniorprofessorship
Analysis of Partial Differential Equations

Dr. Mathias J. Krause
Institute for Mechanical Process Engineering and Mechanics (MVM)
Institute for Applied and Numerical Mathematics (IANM)

KIT Research Group:
Lattice Boltzmann Research Group (LBRG)

Dr. Benno Meier
Institute for Biological Interfaces 4

KIT-Junior Research Group
Hyperpolarized Magnetic Resonance

Dr. Axel Loewe
Institute of Biomedical Engineering

KIT-Junior Research Group
Computational Cardiac Modeling

JProf. Franziska Mathis-Ullrich
Institute of Anthropomatics and Robotics

Juniorprofessorship
Health Robotics and Automation

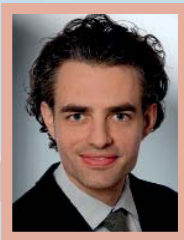
New YIN Alumni

Prof. Anne Koziolek
Professor for Software Engineering
KIT

previously
Junior Professor
Software Engineering

Dr. Philipp Niemann
Scientific Head
Nationales Institut für Wissenschaftskommunikation

previously
KIT Jr Research Group
Science in Presentation



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Professor of Natural Language Processing
Trier University

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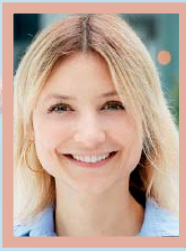
Adaptive Data Analytics - Interferring Knowledge Across Modalities



Prof. Katharina Schratz
Associate Professor
Heriot-Watt University, Edinburgh
Starting from May 2020
Professor
Sorbonne University, Paris

previously
Junior Professor
Numerics of Time-dependent Partial Differential Equations

Dr. Gabriel Rau
Institute of Applied Geosciences

Marie Skłodowska-Curie Fellowship and DFG Grant
Tidal Subsurface Analysis

JProf. Julian Thimme
Institute for Finance

Juniorprofessorship
Asset Pricing

JProf. Katharina Scherf
Institute of Applied Biosciences

Juniorprofessorship
Bioactive and Functional Food Chemistry

JProf. Ingo Wagner
Institute of Sports and Sports Science &
Center for Teacher Training

Juniorprofessorship
Interdisciplinary Didactics of STEM-subjects and Physical Education

What we stand for

Junior reserach group leaders and junior professors are heard in diverse committees at KIT

YIN connects independent junior research group leaders and junior professors at an early stage of their scientific careers. In order to represent this group well, YIN representatives are increasingly engaged at the boards and committees that have been established at KIT. True to the YIN mission, they strive to make KIT an ideal place for young scientists. As future academic leaders, partaking in university politics also gives them the chance to get familiar with academic self-governance. They bring in their individual perspective as well as the practical knowledge of YIN as a whole.

Council for Research and Promotion of Young Scientists

Dr. Manuel Hinterstein

Being a representative speaker of YIN gives me the privilege of being part of the Council for Research and Promotion of Young Scientists (CRYS). Now that the resolutions from the Excellence Strategy are being implemented, this is a particularly exciting time. It was part of the excellence strategy to upgrade our guest status to a voting seat in CRYS. As a result, we are no longer just observers and consultants, but full members. The CRYS advisory board plays an important role for junior researchers at KIT and in particular for junior research group leaders. With our seat with voting rights, we can influence the boundary conditions of current YIN members and future generations to come. For instance, CRYS verifies the credentials for newly established KIT junior research groups and preselects excellent postdocs for the Young Investigator Group Preparation Program as well as suitable candidates to apply for external funding lines like the Helmholtz Young Investigator Groups. As YIN members, we all went through a similar selection processes recently and, thus, can give valid input.

For me personally, participation offers the opportunity to gain an insight into committee work in general and especially into the promotion of young researchers across different disciplines and KIT departments. Moreover, I come into contact with professors with whom I have no scientific overlap. Since all KIT departments are represented in the CRYS, I get an insight into the different department cultures and ways of thinking in the different disciplines. With this knowledge, I can, then, act and react accordingly as a YIN representative to change established structures and make them fit for the future. This can mean, for instance, the need to improve the situation of junior research group leaders at KIT Campus North with regard to teaching and the opportunities to work with students. Both are important aspects in preparing for a professorship and should be accessible to all young scientists who are in qualification phase for a professorial career.

Accordingly, being part of CRYS is a very valuable experience for me and an important field of action for YIN as a whole. We appreciate to be given a voting seat and the opportunity to bring in the perspective of junior group leaders and junior professors.

KIT Convention for scientific and academic employees

Dr. Karsten Woll

Shaping opinion among the scientific and academic employees at KIT, the collection and bundling of these opinions, and the development of suggestions for the individual management organizations are the primary goals of the KIT Convention. Hence, the Convention is in direct exchange with KIT committees such as the executive board, the divisions, or the KIT senate where a mutual flow of information has been established over the past years.

From my perspective, being part on the latter exchange of information is one of the great expereiences for a representative of the Convention. It is worth noting that the Young Investigator Network (YIN) has yet no official status within the KIT-Convention. However, I was elected in 2019 as scientific employee. This enables me to get insight in latest developments at KIT and future directions. The Convention mandate also gives me the chance for active participation on the decision-making and shaping processes allowing me to express and discuss interests of young group leaders. Aside from that, the Convention brings scientists from different disciplines together which is a very inspiring experience for me. Hence, the monthly convention meetings serve as regular platform for face-to-face networking on employee level at KIT.

Steering Committee of the Karlsruhe House of Young Scientists

Dr. Hartwig Anzt

For prospective and current PhD students as well as for postdocs up to two years after their PhD, the Karlsruhe House of Young Scientists (KHYS) is the number one resource for career consulting and higher education. Serving on the Steering Committee of KHYS is not only an honor for me, but also a great pleasure. The Steering Committee reviews proposals submitted by young scientists, assesses the achievements of funded researchers, and decides on strategic funding lines. This comes with significant responsibility, but also with the power to shape the landscape for young scientists, and enable them a bright future. Given my intrinsic motivation to support the youngest and most unbiased generation in the scientific community, I am looking to see this generation grow and thrive with their scientific careers.

HEiKA Board of Directors

Dr. Frank Biedermann

The story of the Heidelberg Karlsruhe Strategic Partnership (HEiKA) began in 2010, motivated by the third call of the German Excellence Initiative. During that time, both the presidential boards of Heidelberg and KIT realized that fostering synergies and closer collaborations between both Universities could give them a competitive edge over rivalling institutions. In addition to stimulating interdisciplinary research in strategically important areas, there has always been the larger vision to also promote teaching and young talents.

I personally learnt about HEiKA through the Karlsruhe House of Young Scientists in 2017 and joined the annual HEiKA members meeting out of interest. They are open to everyone and I would recommend that you visit this event to "breathe in the HEiKA spirit" At that time, YIN alumna Cornelia Lee-Thedieck was still working at KIT and was the young-scientist representative of the HEiKA Board of . I am grateful to have been selected as her successor. Being still relatively "fresh" in this position, I can already assess that the voice of the two junior representatives - Martin Pfannmöller (Centre for Advanced Materials) from the University of Heidelberg and myself - are well heard and that we feel that our opinions are considered, both in the planning stages for upcoming HEiKA events and in the evaluation round. In fact, actions to anchor the support of junior research groups into the HEiKA statute are ongoing. In addition, the business manager of HEiKA, Regine Kleber, and YIN referee Lilith C. Paul, were initiating workshop between KIT and Heidelberg to discuss options for strengthening support and training of junior researchers at both institutions, and what we can learn from each other. This will probably be still a lengthy process and eventually needs the support of the (vice) presidents of KIT and Heidelberg, but the benefits for young researchers at both places may be eventually high and it is worthwhile that we (as YIN) actively support and drive this process.

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