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WIC Workshop 2021: Hybrid Force 2045 September 2021 Workshop Quick Look

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Monterey, California: Naval Postgraduate School

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WIC WORKSHOP 2021: HYBRID FORCE 2045

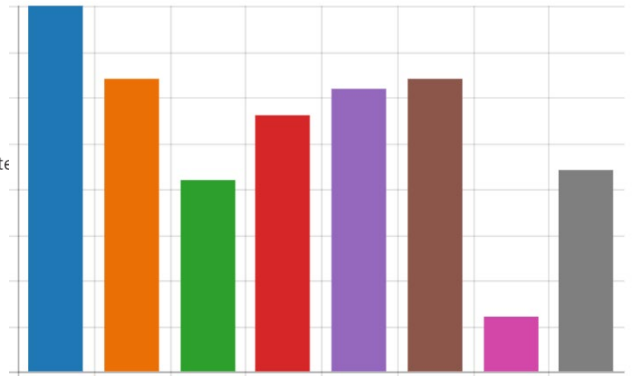


September 2021 Workshop Quick Look

This rapid concept generation workshop was held 20-23 September 2021 and included nearly 130 participants attending either on the NPS campus in Monterey or on the NPS “Virtual Campus” via MS Teams.



- Military (active duty)
- Military (civilian)
- NPS student
- Government (federal, state)
- Industry
- Academia
- International (non-US)
- Other



2021 Design Challenge

How might emerging technologies, new operational concepts, and alternative fleet designs contribute to a more effective naval force across the spectrum from competition to conflict?

How do the alternative fleet designs enhance the effectiveness and resilience of joint, combined and coalition forces across all domains?

WIC 2021 Scenario: Hybrid War 2045

Event Description

The Naval Postgraduate School’s annual Warfare Innovation Workshop acts as an innovation engine, leveraging operationally-focused students and defense-oriented faculty at the Naval Postgraduate School (NPS) to address complex fleet issues – from technical to ethical and from concept-generation to experimentation. Small teams of early career professionals from the fleet, Navy labs, industry, and academia with diverse experience levels and perspectives spend three and a half days rapidly generating concepts of employment and evaluate risk within a future conflict scenario. Government, military, industry, and academic leaders vet these ideas before disseminating results back to Naval leadership.





2021 Selected Concepts

Six **Concept Generation Teams** were facilitated through a two-day rapid concept generation process. From the concepts they presented the following were selected as concepts of interest:

CONCEPTS OF INTEREST – 2021
<u>WARRANTS NEW WORK:</u>
Enders GAM2E: generative architecture for military and machine execution; through reevaluate processes and incorporate AI-enabled technology to optimize human machine teaming
Shallow Submarine: small diesel-powered littoral vessel, increased carrying capacity and shallow dive capability
The Kelp Road Initiative: network of distributed hardware and undersea infrastructure; intermediate force capability leveraging the undersea environment in the competition phase.
JUJITSU “Belts”: joint undersea just-in-time surfacing units; humanitarian (Blue Belt), intermediate conflict (Green Belt), and full-scale A2AD conflict (Red Belt)
MORPHEUS: virtual training environment; virtualized capabilities
RoAM Boat: robotic autonomous manufacturing vessel for production, maintenance, and repair shop; additive manufacturing “mother ship”
ENHANCING WORK UNDERWAY: lightly manned autonomous combat capability (LMACC), fast WIG effect sea plane, CSG resilience, SoS network
All concepts presented will be included in full workshop report.

KEY TAKEAWAYS:

Human in the Loop Machine Learning – using human decision making in wargaming multiple tactical situations to farm a data base for supervised machine learning

Leveraging the Undersea Environment – across the spectrum of competition and warfare by creating sea floor infrastructure and capability now

Autonomy in Sustainment – sustainment, repair, and replacement through unmanned system platforms with additive manufacturing capability

Future Fleet Design – a future fleet of “forward” high risk offensive and primarily unmanned systems with a more traditional sea control and defense force currently found in our carrier strike group capabilities.



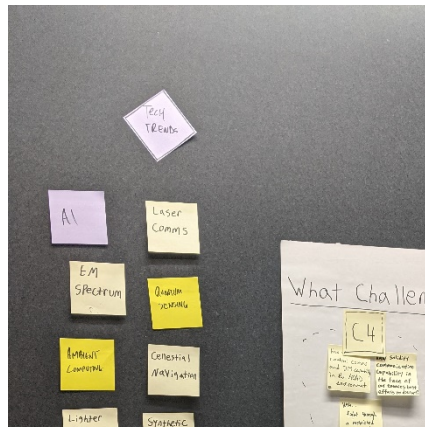
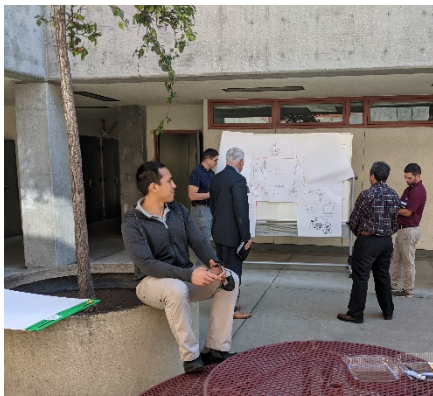
WIC WORKSHOP 2021: HYBRID FORCE 2045



Next Steps

Six concept generation teams presented over a dozen concepts generated over two days of focused work on the design challenge for “Hybrid Force 2045” – this NPS NWSI Warfare Innovation Continuum Workshop co-sponsored by CRUSER. In this first ever hybrid workshop held concurrently on both the NPS campus in Monterey and the NPS “Virtual Campus” via MS Teams, we had nearly 130 active participants from NPS, industry, OPNAV, civilian academia, the Fleet, systems commands, and international participants from Ecuador, Romania, the United Kingdom, and Australia. Concept generation teams composed of NPS students, civilian engineers, and researchers with diverse perspectives addressed issues related to future force design to maximize mission capabilities. We also had two U.S. only teams working on the NPS campus in Monterey in classified spaces on related challenges. Equal in significance to the concept outcomes was the opportunity to build and grow networks between NPS students and faculty, warfare center personnel, and industry engineers.

Four Discovery Panels included speakers from across NPS, the warfare centers, industry, and allied partner nations. We hope these presentations and the conversations they inspired will carry on well after the workshop experience. Our next step will be to synthesize all the concepts provided by the teams into a final report for distribution to our own researchers and NWSI stakeholders. This report will inform the new NWSI Task Force Hybrid Force 2045, and will influence NPS capstone classes, research topics, experimentation, the SEA project, wargaming, prototyping and theses over the remaining nine months of the Warfare Innovation Continuum “Hybrid Force 2045”.



OBJECTIVE: THE KERP ROAD

ENABLE THE ROTTLEABILITY OF PRECISION ENVIRONMENTAL SHAPING EFFECTS ACROSS THE COMPETITIVE SPECTRUM IN ORDER TO GAIN + SUSTAIN ADVANTAGE, + CONDUCT PROACTIVE, PERSISTENT OPE

STRATEGY

- RESILIENT EFFECTS DELIVERY MECHANISM
- DISRUPT ADVERSARY COMPUTE
- ASSURE FRIENDLY COMPUTE

TACTICS: JIJITSU

- JOINT UNDERSEA JUST IN TIME SURVIVING UNIT
- BLUE BELT - HUMANITARIAN ASSIST, DISASTER RELIEF, CLIMATE SUPPORT, INFLUENCE OPS
- GREEN BELT - PRECISION DISRUPTORS (EMP/QUANTUM) - PRECISION ENABLE/RESTORATION (CASP)
- RED BELT - THE GREAT RESET - MODULAR, VIRTUALIZED C2

COMPETITIVE SPECTRUM

NON-MIL | INTERMEDIATE OPS | COMBAT AS2D

OUTSTANDING Q'S

- Policy restrictions/Int'l Waters
- Which Allies get what?

A full final report will be available by November 2021. Email nwsi@nps.edu

WIC WORKSHOP 2021: HYBRID FORCE 2045



Schedule

MON – 20 September

		MAIN ROOM GL 109 and Teams (virtual)
0830	Welcome	VADM Ann Rondeau USN (ret), NPS President
0845	NPS NWSI, Warfare Innovation Continuum & Scenario	CAPT Jeff Kline USN (ret), NPS NWSI WIC Director
0930	Process & Resource Review	Ms. Lyla Englehorn, NPS NWSI Concepts Branch Lead
1000	BREAK	
1030	Discovery Panel I / NWSI Seapower Conversation	Global Geopolitics
	Great Power Competition	Dr. Clay Moltz, Dean NPS Graduate School of International and Defense Studies (IDS)
	Hybrid Warfare & Cold War	Dr. Daniel Moran, NPS National Security Affairs
	Images of Future War	Dr. James Wirtz, NPS National Security Affairs
	Maritime Strategy & Doctrine	Dr. Alessio Patalano, King's College London Department of War Studies
	MODERATOR	CAPT Doug Otte USN (ret), NPS Operations Research
1200	BREAK	
1230	Discovery Panel II	Force Structure
	Surface Ship Design Strategy	VADM David Lewis USN (ret), NPS NWSI Director
	Total Ship Systems Engineering	Professor Jarema Didoszak, NPS Mechanical & Aerospace Engineering
	Future Fleet Architectures	CDR Phillip Pournelle USN (ret), Group W
	Undersea Force Structure Considerations	Mr. Jeff Cares, Alidade Incorporated
	Omni-Domain Irregular Warfare	Mr. Isaac Taylor
	Energy Considerations and Impacts on Force Structure	Dr. Chris Bassler, Center for Strategic and Budgetary Assessments (CSBA)
	MODERATOR	Professor of Practice Jeff Kline, NPS Operations Research
1415	Tasking	CAPT Jeff Kline USN (ret), NPS NWSI WIC Director
1430	Initial Team Meetings	BREAKOUT ROOMS
1600	Networking Social	Glasgow Plaza

WIC WORKSHOP 2021: HYBRID FORCE 2045



Schedule

TUES – 21 September		MAIN ROOM GL 109 and Teams (virtual)
0830	Welcome	Dr. Brian Bingham, NPS CRUSER Director
0845	Discovery Panel III	Emerging Technology
	Rigging for AI	Mr. Brett Vaughan, Navy Chief AI Officer
	Human Machine Teaming	CAPT George Galdorisi USN (ret), NIWC Pacific
	Project Trident: <i>Emerging Technology in Maritime Security</i>	LCDR Jimmy Drennan USN, CIMSEC President
	Rapid Prototyping & Testing	Dr. N. Andrew Browning, AeroVironment
	MODERATOR	Dr. Raymond Buettner, NPS Information Sciences
1015	<i>Common Sense for the Common Good: an evolution of an idea</i>	Mr. Garth Jensen, NSWCCarderock Innovation Director
1030	BREAK	
1045	Concept Generation – Divergent and <i>Mentor Tasking</i>	BREAKOUT ROOMS
1100	Data Gathering	BREAKOUT ROOMS
1300	Concept Generation – Divergent to Convergent	BREAKOUT ROOMS
WED – 22 September		MAIN ROOM GL 109 and Teams (virtual)
0830	Welcome	CAPT Jeff Kline USN (ret), NPS NWSI WIC Director
0845	Discovery Panel IV	Innovation
	Future Warfare Concepts	CDR Justin Davis USN, NPS Defense Analysis
	Innovation Model Adaptation	Ms. Laura Masson, Royal Australian Navy Innovation Centre Director
	Warfare Center Innovation Ecosystem	Dr. Tom Choinski, NUWC Newport
	Are you ready to make a difference? <i>Innovation beyond Ideation</i>	Col (Ret) Todd Lyons USMC, NPS Volunteer Faculty, Innovation Leadership
	MODERATOR	Mr. Dave Nobles, Microsoft
1015	BREAK	
1030	Concept Generation – Convergent	BREAKOUT ROOMS
1100	Directors & Chairs Rotation	BREAKOUT ROOMS
1300	Concept Development – Final Push	BREAKOUT ROOMS
THUR – 23 September		MAIN ROOM GL 109 and Teams (virtual)
0800	Photos & Evaluation	
0830	Final Briefs	<i>Presentations by teams working unclassified</i>
1130	BREAK	
1300	Final Briefs (<i>classified</i>)	STBL B18 (by invitation only – no remote)
1400	ADJOURN	

WIC WORKSHOP 2021: HYBRID FORCE 2045



About Us



NAVAL WARFARE
STUDIES INSTITUTE

NWSI accelerates & enhances warfare concept & capability development via interdisciplinary research & education.



W I C Warfare Innovation Continuum
An Interdisciplinary Exploration Into Future Conflict Solutions

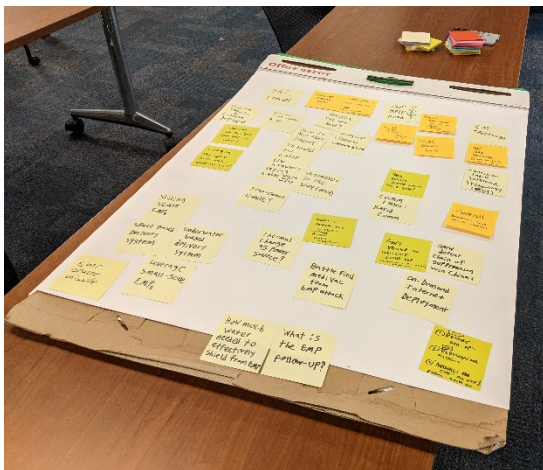
WIC uses classroom projects, theses, and research to advance naval concepts, assess technologies and develop tactics while enhancing our students' educational, research, and combat skills.



CRUSER
Consortium for Robotics and Unmanned
Systems Education and Research

CRUSER aligns academic coursework, military research and institutional focus around robotics and unmanned systems through operational experimentation, educational ventures, technical symposia and concept-generation workshops.

“The open and collaborative networking environment was very refreshing. No matter the rank or background of individuals they were open to discussions of all kinds and genuinely interested in helping. That was one of the most rewarding parts of the WIC for me, making new and lasting connections with my team members, facilitators, and mentors.” – B. McNelly, Mechanical Engineer JHU/APL



NAVAL
POSTGRADUATE
SCHOOL

NPS increases officer combat effectiveness via compelling, relevant, & sustainable higher education & research.