

WIC WORKSHOP 2021: HYBRID FORCE 2045

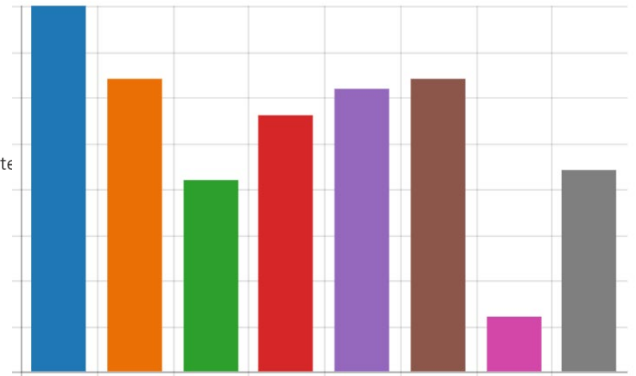


September 2021 Workshop Quick Look

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



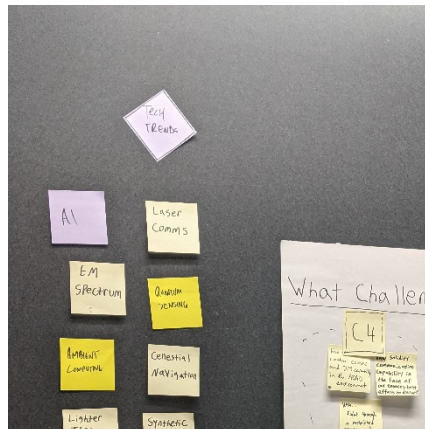
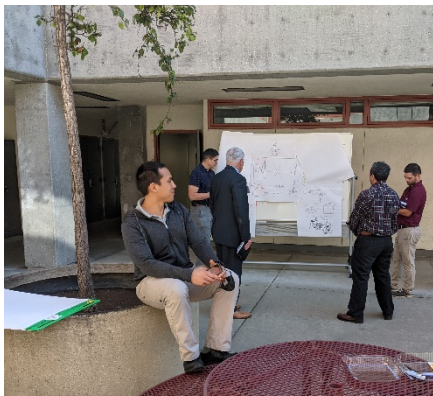
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Next Steps

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

STRATEGY

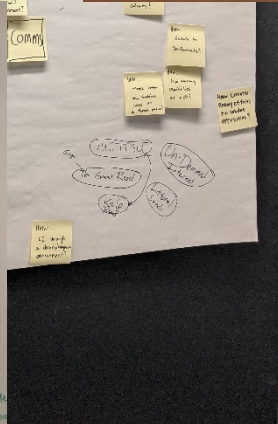
- RESILIENT EFFECTS DELIVERY MECHANISM
- DISRUPT ADVERSARY COMPUTE
- ASSURE FRIENDLY COMPUTE

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 (A CAN)

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 |

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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: *Emerging Technology in Maritime Security* LCDR Jimmy Drennan USN, CIMSEC President

Rapid Prototyping & Testing Dr. N. Andrew Browning, AeroVironment

MODERATOR Dr. Raymond Buettner, NPS Information Sciences

1015 *Common Sense for the Common Good: an evolution of an idea* Mr. Garth Jensen, NSWC Carderock Innovation Director

1030 BREAK

1045 Concept Generation – **Divergent** **BREAKOUT ROOMS**
 and *Mentor Tasking*

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? Col (Ret) Todd Lyons USMC, NPS Volunteer Faculty, Innovation Leadership
Innovation beyond Ideation

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 *Presentations by teams working unclassified*

1130 BREAK

1300 Final Briefs (*classified*) **STBL B18 (by invitation only – no remote)**

1400 ADJOURN

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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

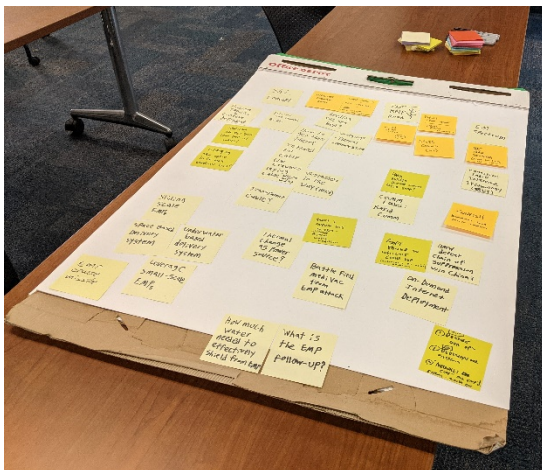
WIC uses classroom projects, theses, and research to advance naval concepts, assess technologies and develop tactics while enhancing our students' educational, research, and combat skills.



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.