Naval Information Warfare Center
ATLANTIC

Naval Information Warfare Center Atlantic

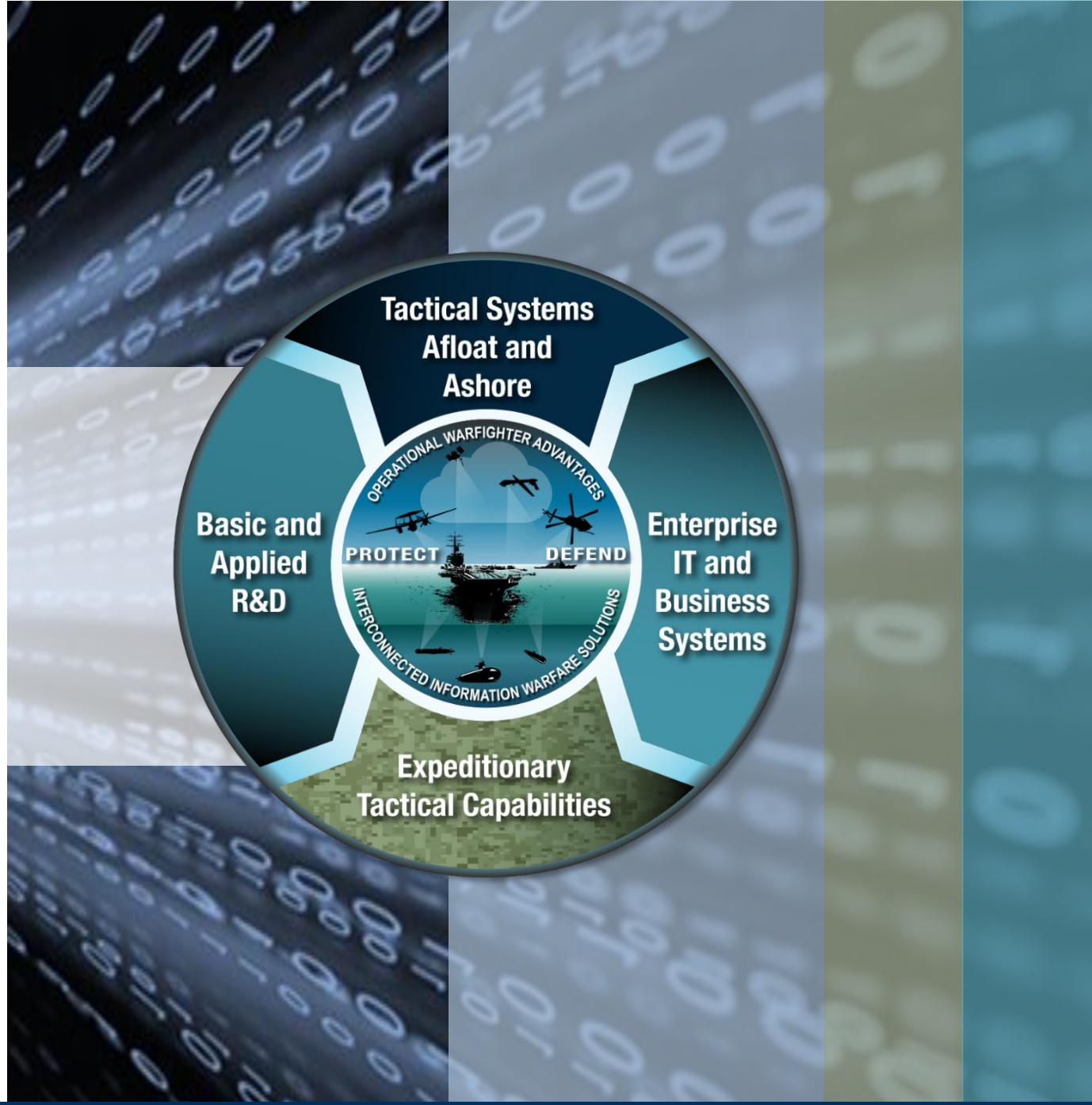
Fleet C4I and Readiness Department

69th Strategic Business Industry Outreach Initiative (SBIOI) Symposium

24 October 2024

Mr. Matt Blair
Fleet C4I and Readiness Department Chief Engineer

Mr. Lee Stubbs
Fleet C4I and Readiness Department Chief Scientist



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Matt Blair
A Brief History

- BSEE (Purdue, 1996), MSEE (Georgia Tech, 1999)
  - Emphasis on communications and signal processing
- First job – JHU/APL
  - Developed and integrated software for “edge device” VLF/LF signal strength measurements and processing, and remote data pulls from the mother ship
- Spent a year in private industry developing test harnesses and reference designs for powerline networking PCI cards
- Joined NIWC (SPAWAR) in 2001 (first day – Monday after 9/11)
  - Contractor until conversion to civilian in 2012
  - Started out in network modeling and simulation for satellite and terrestrial comms (Navy)
  - Transitioned to supporting USMC sponsors 2006-7ish
- Selected as Expeditionary Warfare Department CHENG in 2017
- Rotated into Fleet C4I & Readiness Department CHENG position in 2023

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Fleet C4I and Readiness Department

Vision: To Deliver a Fleet Focused Information Warfare Advantage

Mission: We engineer, test and evaluate, install, and sustain Command, Control, Communications, Computers, & Intelligence (C4I) systems that give our Fleet an information advantage over our adversaries.

Major Sponsors

PEO C4I

- PMW 120
- PMW 130
- PMW 150
- PMW 160
- PMW 170
- PMW 740
- PMW 750/760
- PMW 770
- PMW 790

FRD

NAVSEA

NAVAIR

USCG

Fleet Cyber

Numbered Fleets

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Department Priorities

Vision: To Deliver a Fleet Focused Information Warfare Advantage

- **Speed to Capability**
  - Modular Capability Upgrades
  - Continuous Capability Delivery
  - Smart Risk-Taking
  - Increase Fleet Operational Availability (A_o)
- **Quality On-Target Delivery**
  - DevSecOps
  - Cyber Resilient
  - Constantly Innovating
  - Designed for Installation and Sustainment
- **Fleet Centered Design**
  - Focus on needs of Sailor/Fleet
  - Sailor Self Sufficiency
  - Interoperable

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Interest Areas

- Table stakes: Navy C4ISR (better, faster, cheaper, lighter, etc.)
  - + Naval integration
- Digital transformation at enterprise scale
- AI/ML applications
  - Warfighting
  - Product development and sustainment
- Software supply chain risk management

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Engagement

- Contact me/Matt Blair (843) 218-4000

Be specific! The more I know, the better the job I can do in matching you with relevant stakeholders (within the department as well as across NIWC Atlantic)

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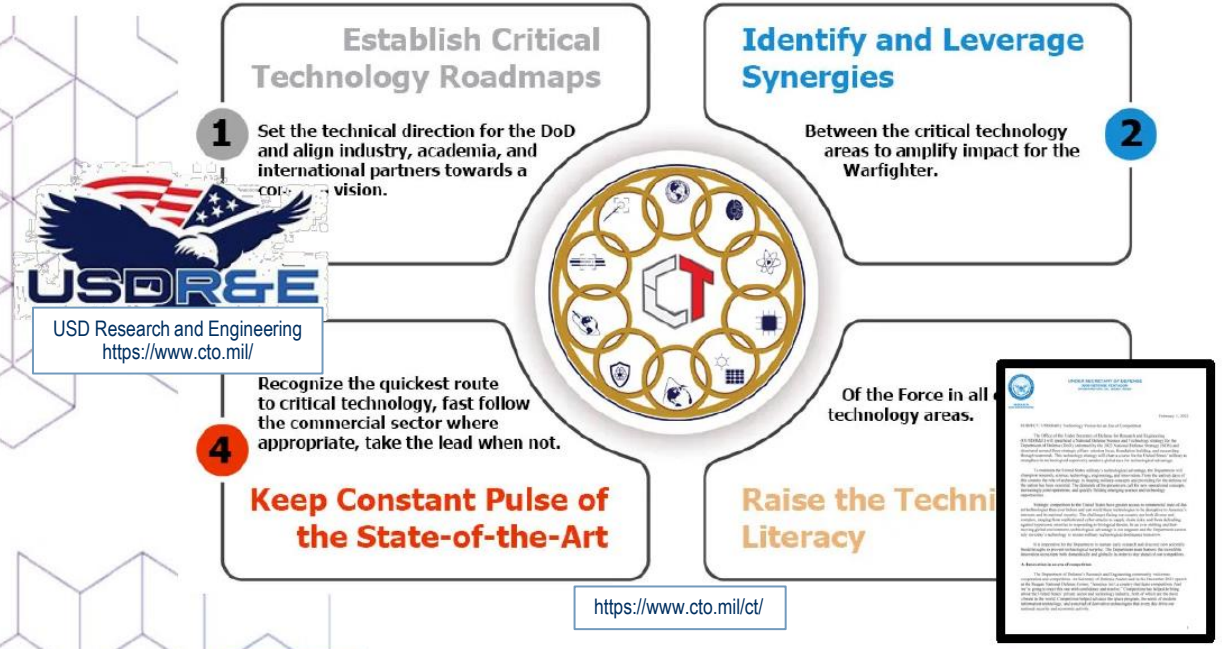
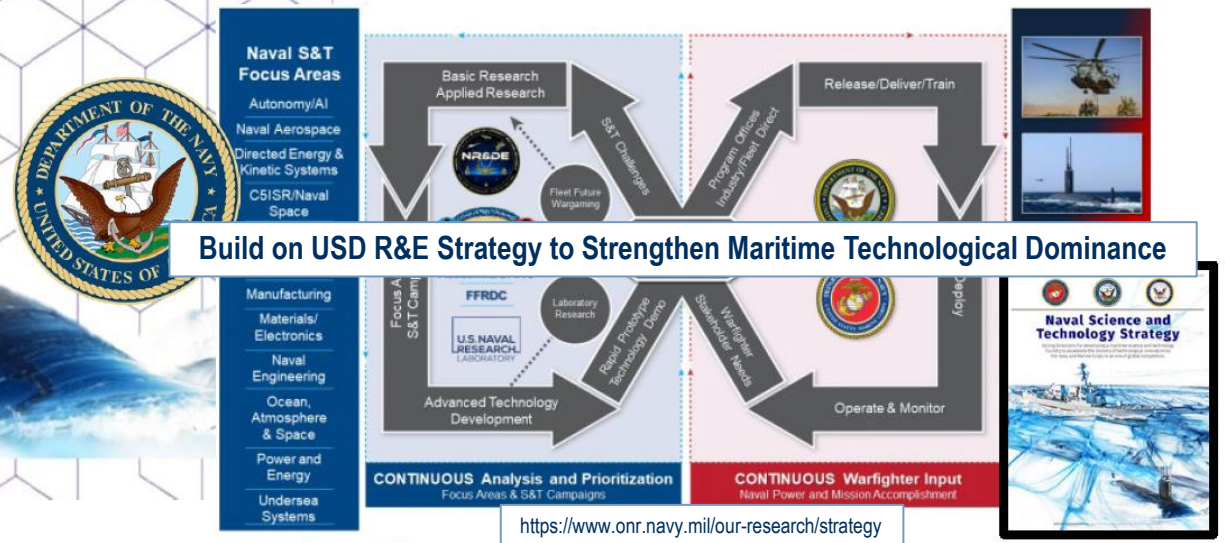
Lee Stubbs
A Brief History

- BSCmpE (Georgia Tech, 2004), M.I.T. (Virginia Tech, 2007) MEng EE (Naval Postgraduate School, 2013)
- Joined NIWC (SPAWAR) in 2004
  - Started out working Global Broadcast Service (GBS) shipboard systems
  - Spent ~10 years developing Communications/EW systems (focus on FPGAs)
  - Contributing author for VITA 49.2 (Digital RF standard) / VITA 65 (OpenVPX)
  - Spent the last 8 years focused on S&T (EW/computer architecture) for Office of Naval Research (ONR)
- Selected as Software Defined Radio Solutions IPT Technical Lead in 2018
- Selected as Fleet C4I & Readiness Department Chief Scientist in March 2024

Fleet C4I - Science and Technology Alignment





Build on USD R&E Strategy to Strengthen Maritime Technological Dominance

PEO C4I narrows in on comparable priorities and focuses on opportunities aligned to our needs

PEO C4I S&T Director: Mrs. Sally McGehee (sally.mcgehee@navy.mil)

Note: Slide from PEO C4I S&T 2024 gaps brief

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Fleet C4I and Readiness Dept - S&T Feedback Cycle

Autonomous C4ISR SSTM (Overby)

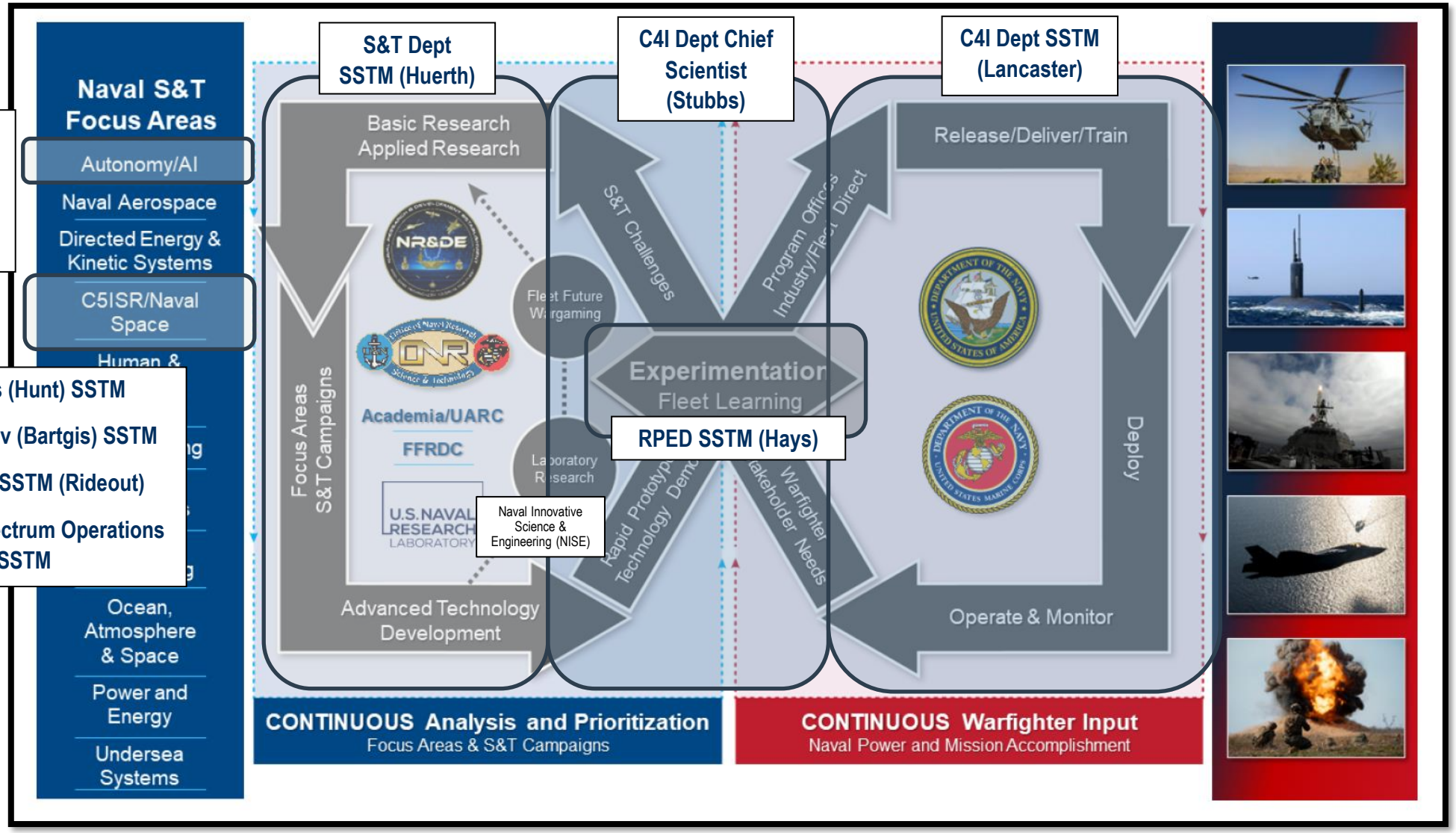
Data Science & AI SSTM (Keisler)

Assured Comms (Hunt) SSTM

Cyber Capability Dev (Bartgis) SSTM

Comms/Networks SSTM (Rideout)

Electromagnetic Spectrum Operations (Taylor) SSTM



SSTM = Senior Scientific Technical Manager

Graphic from Naval S&T Strategy (2024) - https://www.onr.navy.mil/our-research/strategy

Capability Needs and Technology Gaps

PEO C4I

| Modernize (Offset Technical Debt) |
the process of updating technology, practices & systems to keep up with emerging technologies

- Coalition Maritime Command and Control (C2) Interoperability
- Common Data Link (CDL) and Tactical Data Link (TDL) Positioning, Navigation, and Timing (PNT)
- Communications with Non-Geostationary Orbit Satellites
- Decision Support in contested or congested environments
- General Purpose Antennas
- Integrated Communications and Sensing
- Improvements for Submarine Inboard Systems
- Improvements for Sub-Surface Platform Antenna and Associated Components
- Legacy PNT Systems Hardware Obsolescent
- Legacy Tactical Systems Supportability of Modernized Tactical Radio Functionality
- Power Amplifier Modernization
- Remote Software, Waveforms, and Crypto
- Spectral Agility
- Waveforms
- Waveform Resiliency

Science and Technology

Strategy (Investment)

| Seed Areas of Emerging Opportunity |
| Effective Adoption Areas |
| Defense-Specific Areas |

While many technologies may cross between these USD R&E categories, these groupings represent the broad and different approaches that are required to advance technologies crucial to the Department.

DON must constantly assess the relevance of our S&T efforts to core naval missions and operational problems. S&T is a means and maritime superiority is the end.

| Realize Technology Gains Faster |
| Disruptors |
| Play to Our Strengths |
| Experimentation and Wargaming |

Strategy (Focus Areas)

Science and Technology

| State-of-the-Art (Maintain Superiority) |
the best available using the most modern techniques and technology

- Alternative and Assured Positioning, Navigation, and Timing (PNT) Capabilities
- Artificial Intelligence/Machine Learning data tools
- Artificial Intelligence/Machine Learning Enabled Network Tools
- Command and Control (C2) for Long Range Fires
- C2 for Uncrewed Platforms
- C2 of Integrated Air and Missile Defense (IAMD)
- Decision Advantage via Machine Intelligence and Advance Visualization
- Detection and protection form Cyber-attacks on Artificial Intelligence
- Enhanced Situational Awareness for Maritime Operations and Planning
- High Reliability Data Transfer over Intermittent Terrestrial Links
- Joint Integrated Fires Command and Control
- Operational Logistics Planning in support of Distributed Maritime Operations
- Reliable Optical Communications
- Reliable Transfer of Data and Energy in the Undersea Domain

Note: Slide from PEO C4I S&T 2024 gaps brief

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S&T Opportunities

- Cooperative Research and Development Agreements (CRADAs)
  - Full and Limited Partnership CRADAs available
- Small Business Innovation Research (SBIR)
  - https://www.sbir.gov/
- Office of Naval Research
  - https://www.onr.navy.mil/work-with-us/funding-opportunities
- NavalX
  - Palmetto Tech Bridge - https://www.secnav.navy.mil/agility/Pages/tech-bridges/palmetto/default.aspx
  - Mid-Atlantic Tech Bridge - https://www.secnav.navy.mil/agility/Pages/tech-bridges/mid-atlantic/default.aspx
  - NavalX - https://www.secnav.navy.mil/agility/Pages/default.aspx
- Advanced Naval Technology Exercise (ANTX)
  - https://www.niwcatlantic.navy.mil/Technology/ANTX/

Questions?

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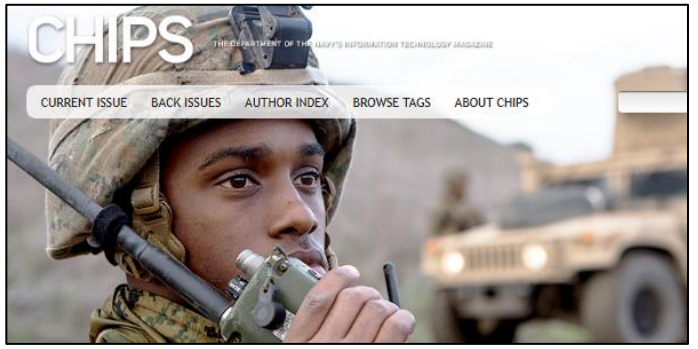
https://www.niwcatlantic.navy.mil

CHIPS Magazine (navy.mil)