NSWC Crane Mission Overview

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Our Mission . . . Provide acquisition engineering, in-service engineering and technical support for SENSORS, ELECTRONICS, ELECTRONIC WARFARE and SPECIAL WARFARE WEAPONS. Apply component and system level product and industrial engineering to surface sensors, strategic systems, special warfare devices and electronic warfare/information operations systems. Execute other responsibilities as assigned by the Commander, Naval Surface Warfare Center.
Quick Facts

1 Mission

$1.4B Business Base

3 Mission Areas
- Strategic Missions
- Expeditionary Warfare
- Electronic Warfare

67% Scientists, Engineers & Technicians

3471 NSWC Crane Employees
- 102 Doctorate
- 616 Masters
- 1595 Bachelors
What is the Government’s Role?

We provide
- Requirements identification
- Develop Open Architecture Standards
- Define Data Structure Requirements
- Independent Verification and Validation (IV&V)
- Technology Assessments
- Qualification
- Independent Engineering Oversight
- Test and Evaluation
- Warfighter Interface

Quick Facts
- Diverse and highly educated workforce with 25,000 scientists, engineers, and technicians (with more than 2,000 Ph.D.s)
- 20 commands across the NAVAIR/NAVSEA Warfare Centers, SPAWAR Systems Centers, ONR and NRL
- Conducts RDT&E for the DoN to discover, develop, transition and field technologically superior naval warfighting capabilities.
- Unique Naval RDT&E facilities including laboratories, test facilities and test ranges
- Serves as principal R&D agents for Navy and Marine Corps Program Executive Offices
- Organizationally aligned to Naval Systems Commands and ONR
  - Naval Sea Systems Command (NSWCs, NWC), Naval Air Systems Command (NAWCS), Space and Naval Warfare Systems Command (SSCs)

Aggressive Research, Development, Test & Evaluation for reliable real world solutions.
Supporting the Warfighter

The Warfighter **NEEDS** intelligent systems providing *real time* dynamic battlespace information to enhance decision making, maneuver, and engagement capabilities.
ELECTRONIC WARFARE - THRUST AREAS

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STRATEGIC MISSION - THRUST AREAS

2028 STRATEGIC INTENT

CROSSROADS FOR STRATEGIC DETERRENCE

Navy-Air Force Collaboration
Emerging Missions
Trusted Electronics & Hardware Cybersecurity
Workforce of the Future

- AI / Machine Learning
- System of Systems Modeling & Simulation
- Big Data Analysis
- Sensor/Data Fusion
- Visualization of data including large data sets and inclusion of physics models
- Statistical analysis
- Systems of Systems Test and evaluation
- Microelectronic technologists
- System-on-a-chip knowledge
- Quantum Sciences (Sensing, Security/Encryption, Computing, Radar, Communications)
- Radar/RF engineering
- Optical/Laser engineering
- Additive manufacturing (incl. energetics)
- Control systems and robotics
- Photonic Technologies (Photonic RF Memory, Hybrid Photonics, Low Stray Emission, Photonic Computing)
- Plasma Technologies (Plasmonics, Plasma Effects for Hypersonic Vehicles, Plasma Antennas)
- Human Systems Integration and Design
- Embedded HW Design and Programming
- Cyber Defense and Security
How Academia Can Help

• **Targeted Defense Masters Degrees**
• **Collaborative Research and Development Proposals**
• **Courses that shape tomorrow’s workforce**

*I can do things that you cannot; you can do things that I cannot, but TOGETHER WE CAN DO GREAT THINGS*  
-Mother Teresa
NSWC Crane University Engagements

Presented by:
Ms. Jenna Dix, Acting ORTA/T2 Manager
Student Opportunities
– Science, Mathematics And Research for Transformation (SMART) Scholarships
– Naval Research Enterprise Internship Program (NREIP)

Faculty Opportunities
– Naval Engineering Education Consortium (NEEC) Research Grants
– NSWC Crane Internally-Funded Research Grants
– Temporary Faculty Employment
– Cooperative Research and Development Agreements
– Educational Partnership Agreements
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BACK UP SLIDES
NSWC Crane Technology Area Priorities

- **Modeling, Simulation and Visualization:**
  - Strategic systems (w/ Purdue NW)
  - Model Based Systems Engineering for System of Systems Capability
  - Live, Virtual, Constructive Capabilities (distributed real-time hardware-in-the-loop / simulation mixed mode)
  - High Fidelity Models of Critical RF Technologies and Systems
  - Game Theory to determine most effective courses of action in scenarios based on multiple sensor and data inputs

- **Machine Learning / AI**
  - AI/ML testing and validation
  - Cognitive, Adaptive EW Capabilities
  - Electro-Optic (EO) machine vision
  - Multimodal sensor fusion (detection, recognition, identification, threat analysis)

- **Microelectronics**
  - Reduction in cost of design, both in IP and tools
  - Rad-hard-by-design research

- **Electromagnetic Maneuver Warfare**
  - Integrated kinetic and non-kinetic capabilities
  - Battlepace Awareness Capabilities to Maintain an Operational Picture Through Use of Electromagnetic Spectrum
  - Payloads for Unmanned Vehicles: Electronic Warfare (EW), Optical, Communications

- **Hypersonic Technologies**
  - Strategic systems (w/ Notre Dame)
  - Sensor payloads (EW, EO/IR, etc.)

- **Power and Energy**
  - Chemistries, Architectures, Management, etc.

- **Energetics**

- **Advanced Sensing Technologies**

- **Automation and Robotics**

- **Human System Integration**
  - Augmented / Virtual Reality
  - Real time data visualization

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Current Methods of Collaboration

- PhD Fellowships
- SMART PhD Scholarships
- Naval Research Enterprise Internship Program
- Naval Engineering Education Consortium Grants
- Microgrants for Research
- Temporary Faculty Hires
- Post-doctoral Researcher On-Site Fellowships
- Cooperative Research and Development Agreements
- Educational Partnership Agreements