The NRL Fact Book is a reference source for information about the U.S. Naval Research Laboratory (NRL). It is updated and placed on NRL's Web site (http://www.nrl.navy.mil) annually. To provide additional information to the reader, a point of contact is listed for each activity. NRL has a continuing need for physical scientists, mathematicians, engineers, and support personnel. Vacancies are filled without regard to age, race, creed, sex, or national origin. Information concerning current vacancies is furnished on request. Address all such inquiries to:

Human Resources Office
Personnel Operations Branch (Code 1810)
U.S. Naval Research Laboratory
Washington, DC 20375-5320

www.nrl.navy.mil

Visit USNRL: 🐦 📚 📱 📺

Quick Reference Telephone Numbers

<table>
<thead>
<tr>
<th></th>
<th>NRL-DC</th>
<th>NRL-SSC</th>
<th>NRL VXS-1</th>
<th>NRL-MRY</th>
<th>NRL CBD</th>
<th>Patuxent River</th>
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<tr>
<td>Hotline</td>
<td>(202) 767-6543</td>
<td>(202) 767-6543</td>
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<td>(202) 767-6543</td>
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<td>Personnel Locator</td>
<td>(202) 767-3200</td>
<td>(228) 688-3390</td>
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<td>(410) 257-4000</td>
<td>(301) 342-3751</td>
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<td>SCO</td>
<td>(202) 767-2541</td>
<td>(228) 688-5328</td>
<td>(202) 767-2541</td>
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<td>(202) 767-2541</td>
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</tbody>
</table>

Additional telephone numbers are listed on pages 133 and 134.
Introduction to the U.S. Naval Research Laboratory

The U.S. Naval Research Laboratory (NRL) is the Department of the Navy’s corporate laboratory, and it reports to the Chief of Naval Research. As the corporate laboratory of the Navy, NRL is the principal in-house component in the Office of Naval Research’s (ONR) effort to meet its science and technology responsibilities.

NRL has had a long and fruitful relationship with industry as a collaborator, contractor, and through Cooperative Research and Development Agreements (CRADAs). NRL values this linkage and continues to develop it.

NRL is an important link in the Navy Research, Development, and Acquisition (RD&A) chain. Through NRL, the Navy has direct ties with sources of fundamental ideas in industry and the academic community throughout the world and provides an effective coupling point to the R&D chain for ONR.

We provide the advanced scientific capabilities required to bolster our country’s position of global naval leadership. Here, in an environment where the nation’s best scientists and engineers are inspired to pursue their passion, everyone is focused on research that yields immediate and long-range applications in the defense of the United States.
Contents

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21 Office of Counsel
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24 Institute for Nanoscience
26 Mission Support Division
27 Military Support Division
28 Scientific Development Squadron ONE (VXS-1)
30 Laboratory for Autonomous Systems Research
32 Human Resources Office
34 Equal Employment Opportunity and Diversity Program Office
35 Cyber Operations Division
36 Ruth H. Hooker Research Library

37 BUSINESS OPERATIONS DIRECTORATE
39 Business Operations Directorate – Code 3000
40 Associate Director of Research for Business Operations
42 Enterprise Resource Planning (ERP) Business Systems Division
43 Contracting Division
44 Financial Management Division
46 Supply and Information Services Division
48 Research and Development Services Division

51 SYSTEMS DIRECTORATE
53 Systems Directorate – Code 5000
54 Associate Director of Research for Systems
56 Radar Division
58 Information Technology Division
60 Optical Sciences Division
62 Tactical Electronic Warfare Division
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<tr>
<th>SITE</th>
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<th>BUILDINGS/STRUCTURES</th>
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<td>Chesapeake Bay Section and Dock Facility Chesapeake Beach*</td>
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**PROPERTY**

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<tr>
<th>Land: 605 acres</th>
<th>Buildings:</th>
<th>Replacement Costs:</th>
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<tr>
<td>RDT&amp;E 3,163,638 ft²</td>
<td>Administrative 281,526 ft²</td>
<td>Buildings Plant Replacement Value (PRV)¹</td>
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<td>Other 284,206 ft²</td>
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¹ Per DON Facilities Asset Data System standard cost factors.
² NRL Accountable Property Acquisition Costs.
* See maps in the General Information section (page 125).
Current Research

The following areas represent broad fields of NRL research. Under each, more specific topics that are being investigated for the benefit of the Navy and other sponsoring organizations are listed. Some details of this work are given in the *NRL Review*, published annually. More specific details are published in reports on individual projects provided to sponsors and/or presented as papers for professional societies or their journals.

**Advanced Radio, Optical, and IR Sensors**
- Advanced optical sensors
- EM/EO/meteorological/oceanographic sensors
- Satellite meteorology
- Precise space tracking
- Radio/infrared astronomy
- Infrared sensors and phenomenology
- UV sensors and middle atmosphere research
- VLBI/astrometry
- Optical interferometry
- Imaging spectrometry
- Liquid crystal technology

**Autonomous Systems**
- Algorithms for control of autonomous systems
- Cognitive robotics
- Human-robot interaction
- Perception hardware and algorithms
- High-level reasoning algorithms
- Machine learning and adaptive algorithms
- Sensors for autonomous systems
- Power and energy for autonomous systems
- Networking and communications for mobile systems
- Swarm behaviors
- Test and evaluation of autonomous systems

**Computer Science and Artificial Intelligence**
- Standard computer hardware, development environments, operating systems, and run-time support software
- Methods of specifying, developing, documenting, and maintaining software
- Human-computer interaction
- Intelligent systems for resource allocation, signal identification, operational planning, target classification, and robotics
- Parallel scientific libraries
- Algorithms for massively parallel systems
- Digital progressive HDTV for scientific visualization
- Adaptive systems: software and devices
- Advanced computer networking
- Simulation management software for networked high performance computers
- Interactive 3D visualization tools and applications
- Real-time parallel processing
- Scalable, parallel computing
- Petaflop computing, globally distributed file systems, terabit-per-second networking

**Directed Energy Technology and Railguns**
- High-energy lasers
- Laser propagation
- Solid-state and fiber lasers
- High-power microwave sources
- Electromagnetic launchers (railguns)
- Pulse detonation engines
- Charged-particle devices
- Pulsed power
- DE effects
- Underwater laser acoustic sources
- Wireless recharging (power beaming)

**Electronic Electro-optical Device Technology**
- Integrated optics
- Radiation-hardened electronics
- Nanotechnology
- Microelectronics
- Microwave and millimeter-wave technology
- Hydrogen masers for GPS
- Aperture syntheses
- Electric field coupling
- Vacuum electronics
- Focal plane arrays
- Radiation effects and satellite survivability
- Molecular engineering
- Computational Electronics and Electromagnetics

**Electronic Warfare**
- EW/C2W/IW systems and technology
- COMINT/SIGINT technology
- EW decision aids and planning/control systems
- Intercept receivers, signal processing, and
identification systems
Passive direction finders
Decoys and offboard countermeasures (RF and IR)
Expendable autonomous vehicles/UAVs
Repeaters/jammers and EO/IR active countermeasures
Platform signature measurement and management
Threat and EW systems computer modeling and simulations
Visualization
Hardware-in-the-loop and flyable ASM simulators
Missile warning infrared countermeasures
RF environment simulators
EO/IR multispectral/hyperspectral surveillance

Enhanced Maintainability, Reliability, and Survivability Technology
Coatings
Friction/wear reduction
Water additives and cleaners
Fire safety
Laser hardening
Satellite survivability
Corrosion control
Automation for reduced manning
Radiation effects
Mobility fuels
Chemical and biological sensors
Environmental compliance

Environmental Effects on Naval Systems
Meteorological effects on communications
Meteorological effects on weapons, sensors, and platform performance
Air quality in confined spaces
Electromagnetic background in space
Solar and geomagnetic activity
Magnetospheric and space plasma effects
Nonlinear science
Ionospheric behavior
Oceanographic effects on weapons, sensors, and platforms
EM, EO, and acoustic system performance/optimization

Environmental hazard assessment
Contaminant transport
Biosensors
Microbially induced corrosion
Laboratory simulation of space plasmas

Imaging Research/Systems
Remotely sensed signatures analysis
Real-time signal and image processing algorithms/systems
Image data compression methodology
Image fusion
Automatic target recognition
Scene/sensor noise characterization
Image enhancement/noise reduction
Scene classification techniques
Radar and laser imaging systems studies
Coherent/incoherent imaging sensor exploitation
Remote sensing simulation
Hyperspectral imaging
Microwave polarimetry
Image processing

Information Technology
High-performance, all-optical networking
Antijam communication links
Next-generation, signaled optical network architectures
Integrated voice and data
Information security (INFOSEC)
Voice processing
High performance computing
High performance communications
Requirements specification and analysis
Real-time computing
Wireless mobile networking
Behavior detection
Machine learning
Information filtering and fusion
Integrated internet protocol (IP) and asynchronous transfer mode (ATM) multicasting
Reliable multicasting
Wireless networking with directional antennas
Sensor networking
Communication network systems modeling/simulation/emulation
Cognitive radio/dynamic spectrum awareness
and spectrum agility
High assurance software
Distributed network-based battle management
High performance computing supporting
uniform and nonuniform memory access with
single and multithreaded architectures
Distributed, secure, and mobile information
infrastructures
Simulation-based virtual reality
High-end, progressive HDTV imagery
processing and distribution
Defensive information warfare
Virtual reality/mobile augmented reality
3D multimodal interaction
Model integration (physical, environmental,
biological, psychological) for simulation
Command decision support
Data fusion

**Marine Geosciences**
Seafloor physical and acoustic properties,
methane gas and methane hydrates
Laboratory measurements of a wide variety of
sediment physical, elastic, geotechnical, and
acoustic properties
Numerical simulation and prediction of seafloor
sediment properties
Generation and analysis of interface (Scholte)
waves to characterize shear strength of marine
sediments
Acoustic, electro-optic, and electromagnetic
sensing for seafloor mapping and
characterization
Through-the-sensors seafloor characterization
Production and uncertainty estimation of ocean
bathymetry
Modeling, simulations, and prediction of
nearshore and riverine processes
Geospatial human machine interaction
Geospatial science and technology for enabling
information dominance
Geophysical machine learning methods

**Meteorology**
Global, theater, tactical-scale, and on-scene
numerical weather prediction
Data assimilation and physical initialization
Atmospheric predictability and adaptive
observations
Adjoint applications
Marine boundary layer characterization
Air/sea interaction; process studies
Coupled air/ocean/land model development
Tropical cyclone forecasting aids
Satellite data interpretation and application
Aerosol transport modeling
Meteorological applications of artificial
intelligence and expert systems
On-scene environmental support system
development/nowcasting
Tactical database development and applications
Meteorological tactical decision aids
Meteorological simulation and visualization

**Ocean Acoustics**
Underwater acoustics, including propagation,
noise, and reverberation

Advanced alloy systems
Solid free-form fabrication
Environmental effects
Energetic materials/explosives
Aerogels and underdense materials
Nanoscale materials
Nondestructive evaluation
Ceramics and composite materials
Thin film synthesis and processing
Electronic and piezoelectric ceramics
Thermoelectric materials
Active materials and smart structures
Computational material science
Paints and coatings
Flammability
Chemical/biological materials
Spintronic materials and half metals
Biomimetic materials
Multifunctional materials
Power and energy
Synthetic biology
Microwave and high pressure processing
Additive manufacturing

**Materials**
Superconductivity
Magnetism
Biological materials
Materials processing
Fiber-optic acoustic sensor development
Deep ocean and shallow water environmental acoustic characterization
Undersea warfare system performance modeling, unifying the environment, acoustics, and signal processing
Target reflection, diffraction, and scattering
Acoustic simulations
Tactical decision aids
Sonar transducers
Dynamic ocean acoustic modeling
Underwater acoustic communications
Acoustics signature

Oceanography
Oceanography instrumentation
Open ocean, littoral, polar, and nearshore oceanographic forecasting
Shallow water oceanographic effects on operations
Modeling, sensors, and data fusion
Ocean data assimilation
Bio-optical processes
Oceanographic processes observation: mixing, waves, circulation
Waves, tides, and surf prediction
Sea ice modeling and prediction
Coupled ocean-ice-wave-air-land modeling
Coupled data assimilation
Global, theater, and tactical scale modeling
Remote sensing of oceanographic parameters
Satellite Image Analysis
In-water sensing of ocean optics and biology
Turbulence effects on ocean optics
Lidar studies of particulates and turbulence in the ocean

Space Systems and Technology
Two-phase heat transfer systems
Space systems architectures and requirements
Advanced payloads and optical communications
Controllers, processors, signal processing, and VLSI
Precision orbit estimation
Onboard autonomous navigation
Satellite ground station engineering and implementation
Tactical communication systems

Spacecraft antenna systems
Launch and on-orbit support
Precise Time and Time Interval (PTTI) technology
Atomic time/frequency standards/instrumentation
Passive and active ranging techniques
Design, fabrication, and testing of spacecraft and hardware
Structural and thermal analysis
Attitude determination and control systems
Reaction control
Propulsion systems
Navigation, tracking, and orbit dynamics
Spaceborne robotics applications

Surveillance and Sensor Technology
Point defense technology
Imaging radars
Surveillance radars
Multifunction RF systems
High-power millimeter-wave radar
Target classification/identification
Airborne geophysical studies
Fiber-optic sensor technology
Undersea target detection/classification
EO/IR multispectral/hyperspectral detection and classification
Sonar transducers
Electromagnetic sensors, gamma ray to RF wavelengths
Neutral and charged-particle sensors
Radiation transport modeling and evaluation
SQUID for magnetic field detection
Low observables technology
Ultrawideband technology
Interferometric imagery
Microsensor system
Digital framing reconnaissance canvas
Biologically based sensors
Digital radars and processors

Undersea Technology
Autonomous vehicles
Bathymetric technology
Anechoic coatings
Acoustic holography
Unmanned undersea vehicle dynamics
Weapons launch
Executive Directorate

Code 1000 and Code 1001

The Commanding Officer (Code 1000) and the Director of Research (Code 1001) share executive responsibility for the management of the Naval Research Laboratory. In accordance with Navy requirements, the Commanding Officer is responsible for the overall management of the Laboratory and exercises the usual functions of command, including compliance with legal and regulatory requirements, liaison with other military activities, and the general supervision of the quality, timeliness, and effectiveness of the technical work and of the support services.

The Commanding Officer delegates line authority and assigns responsibility to the Director of Research for the Laboratory’s technical program, its planning, conduct, and staffing; evaluation of the technical competence of personnel; liaison with the scientific community; selection of subordinate technical personnel; exchange of technical information; and the effective execution of the NRL mission.

Within the limits of Navy regulations, the Commanding Officer and the Director of Research share authority and responsibility for the internal management of the Laboratory. The Commanding Officer retains all authority and responsibility specifically assigned to him by higher authority.

The mission of the Laboratory is carried out by three science and technology directorates and the Naval Center for Space Technology, supported by the Business Operations Directorate and the Executive Directorate. In addition, the Laboratory’s operating staffs provide assistance in their special fields to the Commanding Officer and to the Director of Research. The operating staffs are listed on the following pages of this publication.
Key Personnel

CAPT R. Vigil, USN  Commanding Officer  1000
Dr. B.G. Danly  Director of Research  1001
Mr. D.J. DeYoung  Executive Assistant to the Director of Research  1001.1
Vacant  Executive Assistant for Technology Deployment  1001.3
Dr. A.L. Callahan  NRL Historian  1001.15
Mr. M.W. Evers  Inspector General  1000.1
Ms. L.L. Hill  Deputy Equal Employment Opportunity Officer  1000.2
Mr. I.M. Kearl  Managers’ Internal Control (MIC) Program Coordinator  1000.12
CAPT G.T. Petrovic, USN  Executive Officer  1002
Ms. A.M. Horansky-McKinney  Head, Office of Technology Transfer  1004
Ms. M.E. Dixon  Head, Office of Program Admin and Policy Development  1006
Mr. J.N. McCutcheon  Head, Office of Counsel  1008
Mr. V. Chen  Head, Strategic Communications Office  1030
Dr. E.S. Snow*  Director, Institute for Nanoscience  1100
Mr. T. Brewer  Head, Mission Support Division/STILO  1200
Mr. K.J. Pawlovich  Head, Safety Branch  1250
CDR J.K. Tran, USN  Head, Military Support Division  1400
CDR E.M. Thomas, USN  Commanding Officer, Scientific Development Squadron ONE (VXS-1)  1600
Dr. K.S. Swider-Lyons*  Director, Laboratory for Autonomous Systems Research  1700
Ms. M.V. Kisamore  Director, Human Resources Office  1800
Mr. K.A. Rohwer*  Head, Office of the Command Information Officer (OCIO)  1900
Ms. K.P. Chappell  Deputy for Small Business  3005

*Acting  *Additional duty
Commanding Officer

Captain Ricardo Vigil is a native of Paterson, New Jersey, he received his commission in 1996 through the Naval Reserve Officer Training Corps program at Rensselaer Polytechnic Institute in Troy, New York. After completing Surface Warfare Officer School, he reported to USS Princeton (CG 59) where he served as the ship’s communications officer and electronic key management system custodian. During his tour, he qualified as a Surface Warfare Officer and completed a counter-narcotic deployment in the Caribbean and Eastern Pacific.

After Navy nuclear power training in Charleston, South Carolina and Ballston Spa, New York, he reported to USS Carl Vinson (CVN 70) where he served as the reactor electrical division officer. During his tour, he completed propulsion plant watch officer and nuclear engineer officer qualifications. Following his division officer and shore tours, Captain Vigil transferred to the Engineering Duty Officer (EDO) community in 2004. During his EDO qualification tour, he served at Space and Naval Warfare (SPAWAR) Systems Center Pacific as a project officer for shipboard computer network defense. He then served as officer-in-charge at (OIC) SPAWAR Middle East Detachment at U.S. Naval Forces Central Command (NAVCENT)/United States Fifth Fleet in Bahrain from February 2009 to April 2010.

Captain Vigil then served as assistant program manager (APM) for the Command and Control Systems (PMW-150) program office from April 2010 to September 2011 where he delivered Joint Range Extension to the fleet providing high throughput LINK-16 and LINK-22 connectivity. Prior to NRL, Captain Vigil served as the principal APM for Directed Energy Weapons branch in the Above Water Sensors Program Office (PEO IWS 2.0).

Captain Vigil has a bachelor’s degree and master’s degree in physics from Rensselaer Polytechnic Institute and Naval Postgraduate School respectively, and a doctorate in applied physics from the Naval Postgraduate School. He is an Acquisition Corps member with a Level III certification in Engineering and Program Management. His personal awards include the Meritorious Service Medal, Navy and Marine Corps Commendation Medal (4), Navy and Marine Corps Achievement Medal, and various unit and sea service awards.
Dr. Bruce Danly was selected as the Director of Research for the U.S. Naval Research Laboratory (NRL) in December 2016, and has been in various roles at NRL since 1995.

He was appointed to the Senior Executive Service (SES) in February 2008. From 2008 through 2016, Dr. Danly served as Superintendent, Radar Division. The division is responsible for basic and applied research and development in radar and related sensors for the Navy and Marine Corps. The division also provides support to the Navy acquisition community and to the operational Navy on quick-reaction tasks.

Prior to his appointment to the SES, Dr. Danly served as Branch Head, Microwave Technology Branch, in NRL’s Electronics Science and Technology Division (ESTD) from 2006 to 2008. This branch carries out R&D on both wide-bandgap and narrow-bandgap semiconductor devices and passive and active microwave components. Dr. Danly originally entered government service in 1995 as Head of the High Power Devices Section, Vacuum Electronics Branch, in the ESTD. From 1995 to 2006, he led a group that developed high-power millimeter-wave technology for application to radar, communications, and electronic warfare systems.

He represented the U.S. Navy to the Technology Cooperation Program Intelligence Surveillance Tracking Acquisition and Reconnaissance Technical Panel 2 on RF Sensing from 2010 to 2016, and was appointed chairman of the panel in 2016. He also served as a U.S. at-large member to the NATO Sensors and Electronics Technology Panel from 2014 to 2016.

Dr. Danly received a bachelor’s degree in physics from Haverford College in 1978 and a doctorate in physics from the Massachusetts Institute of Technology in 1983. His thesis work was in the field of quantum electronics. Prior to his arrival at NRL in 1995, Dr. Danly was on the research staff at the MIT Plasma Fusion Center, as a research scientist from 1983 to 1992, and as a Principal Research Scientist from 1992 to 1995, where he worked on high power microwave and millimeter wave sources for fusion, accelerator, and defense applications.

Dr. Danly was elected as a Fellow of the Institute of Electrical and Electronic Engineers (IEEE) in 2003 for his work on millimeter-wave sources. His other awards include the Robert L. Woods award from the Advisory Group on Electron Devices of the Office of Secretary of Defense in 1999 for leadership in the vacuum electronics community and the Navy Meritorious Unit Commendation as a member of the NRL research staff from September 11, 2001 to 2006. Dr. Danly was awarded a group award in 2002 for development of the WARLOC High-Power Millimeter-Wave Radar, and received NRL Technology Transfer Awards in 2000 and 2003. Dr. Danly is a member of the American Physical Society and IEEE, and served on the IEEE Aerospace and Electronic Systems (AES) Radar Systems Panel from 2008 to 2013. He has published more than 70 papers in scientific and technical journals.
The Executive Council consists of executive, management, and administrative personnel. Executive Council members include the following:

- Commanding Officer, Chairperson
- Inspector General
- Director of Research
- Executive Assistant to the Director of Research
- Associate Directors of Research
- Executive Officer
- Director, Naval Center for Space Technology
- Associate Director, Naval Center for Space Technology
- Heads of Divisions
- Director, Laboratories for Computational Physics and Fluid Dynamics
- Director, Center for Bio/Molecular Science and Engineering
- Director, Human Resources Office
- Deputy Equal Employment Opportunity Officer
- Strategic Communications Officer
- Head, Office of Program Administration and Policy Development
- Safety Officer
- Head, Office of Counsel
- Head, Office of Technology Transfer
- Head, Management Information Systems Staff
- Head, Office of Research Support Services
- Representative, Administrative Advisory Council
- Director, Institute for Nanoscience
- Director, Laboratory for Autonomous Systems Research
The Research Advisory Committee advises the Commanding Officer and the Director of Research on scientific programs and the administration of the Laboratory. The committee assists in planning the long-range scientific program, coordinating the scientific work, reviewing the budget, accepting or modifying problems, considering personnel actions, and initiating such studies as may be necessary or desirable. The membership consists of the following:

- Director of Research, Chairperson
- Commanding Officer
- Associate Directors of Research
- Executive Officer (Observer)
Inspector General — Code 1000.1

The Laboratory’s Inspector General investigates, inspects, and/or inquires into matters that affect the operation and efficiency of NRL. These matters include but are not limited to: effectiveness, efficiency, and economy; management practices; and fraud, waste, and abuse. He serves as principal advisor to the Commanding Officer on the Managers’ Internal Control Program, and is the primary point of contact and liaison with all inspections and audit agencies outside NRL.

Deputy Equal Employment Opportunity Officer — Code 1000.2

The Deputy Equal Employment Opportunity Officer (DEEOO) is the EEO program manager and the advisor to the Commanding Officer on all EEO matters. The DEEOO manages the discrimination complaint and reasonable accommodation processes, provides workplace accommodations, and directs the Laboratory’s affirmative action plans and special emphasis programs (Federal Women’s, Employment for Individuals with Disabilities, and Hispanic Employment). The DEEOO coordinates barrier analysis efforts to identify barriers to EEO for minorities and women in the workplace and develops/recommends strategies for eliminating existing barriers.

Executive Officer — Code 1002

The Executive Officer serves as the Deputy to the Commanding Officer and acts for the Commanding Officer in his absence. The Command Support Division (Code 1200), the Military Support Division (Code 1400), and the Scientific Development Squadron One (VXS-1) (NAS Patuxent River, Maryland, Code 1600) report directly to the Executive Officer.

Strategic Communications Officer — Code 1030

The Strategic Communications Officer (SCO) advises the Commanding Officer and Director of Research on public affairs matters, including external and internal relations and community outreach, and serves as the Commanding Officer’s principal assistant in the area of public affairs. To do this, the SCO plans and directs a program of public information dissemination on official NRL activities. The SCO coordinates responses to requests from the news media and the public for unclassified information or materials dealing with the Laboratory, coordinates participation in community relations activities, and directs the internal information programs. The SCO is also responsible for coordinating all actions within the Laboratory that respond to requirements of the Freedom of Information Act (FOIA) and coordinates support from Technical Information Services and Digital and Visual Information for publications, printing and duplication, graphics, videography, photography, and archival services for photos/videos.
Head: Ms. A.M. Horansky-McKinney

Point of Contact: Ms. E.R. Metcalf
Code 1004
(202) 767-7229

Key Personnel

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>Ms. A.M. Horansky-McKinney</td>
<td>Head, Technology Transfer Office</td>
<td>1004</td>
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<tr>
<td>Vacant</td>
<td>Sr. Licensing Associate</td>
<td>1004</td>
</tr>
<tr>
<td>Mr. C.P. Childs</td>
<td>Sr. Partnerships Manager</td>
<td>1004</td>
</tr>
<tr>
<td>Mr. G. Letscher</td>
<td>Licensing Associate</td>
<td>1004</td>
</tr>
<tr>
<td>Dr. H. Ricks-Laskoski</td>
<td>Licensing Associate</td>
<td>1004</td>
</tr>
<tr>
<td>Ms. E.R. Metcalf</td>
<td>Sr. Management Analyst</td>
<td>1004</td>
</tr>
<tr>
<td>Ms. H.O. Sofola</td>
<td>Administrative Assistant</td>
<td>1004</td>
</tr>
</tbody>
</table>

Personnel: 7 full-time civilian

Basic Responsibilities

The Technology Transfer Office (TTO) is responsible for NRL’s implementation of the Federal Technology Transfer Act of 1986 (Public Law 99-502). The law requires the transfer of Government innovative technologies to industry for commercialization as products and services for public benefit. TTO negotiates Cooperative Research and Development Agreements (CRADAs) under which NRL investigators collaborate with investigators from industry, academia, state or local governments, or other Federal agencies to develop NRL technologies for government and/or commercial use. It markets NRL’s patented inventions, negotiates patent license agreements under which the Navy grants a licensee the right to make, use, and sell NRL inventions (in exchange for receiving licensing fees and a percentage of sales), and enforces licenses to assure diligence in commercialization efforts.
Office of Program Administration and Policy Development

Code 1006

Head: Ms. M.E. Dixon

Point of Contact: Ms. D.J. Edelen
Code 1006.2
(202) 767-2668

Key Personnel

Ms. M.E. Dixon
Head, Office of Program Admin and Policy Development
1006
Ms. M.E. Dixon*
Head, Program Administration Staff
1006.1
Ms. D.J. Edelen
Administrative Officer
1006.2
Ms. M.M. Webb
Head, Executive Management and Policy Development Staff
1006.3
Ms. M.E. Barton
Directives
1006.31
Ms. M.E. Dixon*
Head, Conference Facilities Staff
1006.4
Vacant
Special Assistant
1006.6
Mr. K. Szczublewski
Administrative Resources Manager
1006.7
Ms. T.M. Chops
Protocol Officer
1006.8

Personnel: 16 full-time civilian
*Acting

Basic Responsibilities

The Office of Program Administration and Policy Development provides managerial, technical, and administrative support to the Director of Research (DOR) in such areas as program and policy development, intra-Navy and inter-Service Science and Technology (S&T) program coordination; liaison with other Navy, DoD, and government activities on matters of mutual concern; and support to the Executive Directorate in planning and directing NRL’s S&T (6.1, 6.2) program. Specific functions include: monitoring and providing background information on technical and policy matters that come under the purview of the DOR; representing NRL, ONR, and/or the Navy on tri-Service or DoD-wide coordination matters; performing special studies or chairing ad hoc study groups regarding program decisions or policy positions; performing special studies involving major NRL programs and resource issues; providing administrative support in the areas of personnel, budget, facilities, equipment, and security; providing executive management information and analyses for various aspects of the S&T program effort; coordinating VIP visits to NRL; managing the NRL directives system; administering the NRL response to Congressional requests; maintaining the NRL R&D achievements file; developing the S&T guidance for monitoring and reporting the NRL S&T program; administering NRL’s various postdoctoral fellowship programs; and managing the Facility Modernization Program.
Office of Counsel
Code 1008

Head: Mr. J.N. McCutcheon

Point of Contact: Legal Assistant
Code 1008.1
(202) 767-2244

Key Personnel

Mr. J.N. McCutcheon  Head, Office of Counsel  1008
Mr. C.G. Steenbuck  Deputy Counsel  1008.1
Mr. K.L. Broome  Associate Counsel/Intellectual Property  1008.2
Mr. D.J. Gearin  Assistant Counsel/SSC Legal Matters  1008.3
Mr. S.G. Bell  Assistant Counsel/SSC IP Matters  1008.3

Personnel: 30 full-time civilian

Basic Responsibilities

The Office of Counsel is responsible for providing legal services to NRL’s management in all areas of general, administrative, intellectual property, and technology transfer law. The Office reviews all procurement-related actions; reviews NRL scientific papers prior to publication; prepares patent applications and prosecutes the applications through the Patent and Trademark Office; defends against contract protests, other contract litigation, and personnel cases; and advises on other legal matters relating to technology transfer, personnel, fiscal, and environmental law.

NRL Counsel also serves as legal advisor to the Commanding Officer and Director of Research.
Head: Mr. V.S. Chen

Point of Contact: Mr. K.M. Pulver
Code 1030
(202) 767-2541

Key Personnel

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. V.S. Chen</td>
<td>Strategic Communications Officer</td>
<td>1030</td>
</tr>
<tr>
<td>Ms. K.K. Parrish</td>
<td>Deputy Strategic Communications Officer</td>
<td>1030.1</td>
</tr>
<tr>
<td>Mr. K.M. Pulver</td>
<td>Administrative Assistant</td>
<td>1030</td>
</tr>
<tr>
<td>MC1 J.J. Belanger, USN</td>
<td>Military Deputy</td>
<td>1031.1</td>
</tr>
<tr>
<td>Ms. J.R. Koch</td>
<td>Head, Public Affairs Section</td>
<td>1031</td>
</tr>
<tr>
<td>Vacant</td>
<td>Head, Marketing and Outreach Section</td>
<td>1032</td>
</tr>
<tr>
<td>Mr. J.M. Sunderman</td>
<td>Head, Digital and Visual Information Section</td>
<td>1033</td>
</tr>
<tr>
<td>Ms. J.L. Atkinson</td>
<td>Head, Technical Information Services Section</td>
<td>1034</td>
</tr>
</tbody>
</table>

Personnel: 19 full-time civilian; 1 student/part-time; 1 military; 1 contractor

Staff Activity Areas

- Public Affairs
- Exhibits/Posters
- STEM Outreach
- Digital and Visual Information
- Technical Information Services
- Social Media Posts
- NRL Academy
Basic Responsibilities

The Strategic Communication Office (SCO) is here to help you answer that question and create the products to help you communicate your work internally and externally. Our mission is to help you drive more work to the Lab, and help you recruit and retain employees. SCO has four sections: Public Affairs, Exhibits and STEM Outreach, Digital and Visual Information, and Technical Information Services. We will help you: 1) create plans and products to help you communicate; 2) answer media queries; 3) identify the right opportunity to exhibit NRL work and talent at conferences and STEM outreach events; and 4) meet your publication and documentation needs.

HOW WE HELP YOU TELL NRL’s STORY EFFECTIVELY

We help you create products
Multimedia Content
Technical Reports
Marketing Materials

We help you get the word out
Exhibits and STEM
Media Relations
Newsletter (Lababstracts)
Website
Social Media

We help you get the word in
NRL Academy
Newsletter (Lab Report)
Pipeline
Digital Signage
Institute for Nanoscience
Code 1100

Director: Dr. E.S. Snow

Point of Contact: Ms. C.A. Habron
Code 1100
(202) 767-1804

Key Personnel

Dr. E.S. Snow† Director, Institute for Nanoscience 1100
Ms. C.A. Habron Position Assistant 1100
Mr. D.R. St. Amand Facilities Manager 1100
Dr. A.K. Boyd Facilities Manager 1100
Mr. W.A. Spratt Facilities Manager 1100

Personnel: 4.5 full-time civilian
† Additional Duty

Staff Activity Areas

Interdisciplinary nanoscience that enables:
- Low-power, high-speed electronics
- Lightweight, high-strength materials
- Highly sensitive molecular sensors
- Efficient energy generation and storage
- Quantum information technologies
- Nano/bio systems
- Warfighter health monitoring and healing
- Neuromorphic computing
Basic Responsibilities

The Institute for Nanoscience has two primary responsibilities: to administer an interdisciplinary research program in nanoscience and to provide NRL scientists with high-quality laboratory space and state-of-the-art nanofabrication facilities.

The mission of the research program is to conduct highly innovative, interdisciplinary research at the intersections of the fields of materials, electronics, and biology in the nanometer size domain. The Institute exploits the broad multidisciplinary character of NRL to bring together scientists and engineers with disparate training and backgrounds to attack common goals at the intersection of their respective fields at this length scale. The Institute’s S&T programs provide the Navy and DoD with scientific leadership in this complex, emerging area and help to identify opportunities for advances in future defense technology.

The Institute also operates a nanoscience research building containing nanofabrication facilities and environmentally controlled measurement laboratories. The central core of the building, a 5000 ft$^2$ Class 100 clean room, has been outfitted with the newest tools to permit nanofabrication, measurement, and testing of devices. In addition to the clean room facility, the building also contains 5000 ft$^2$ of controlled-environment laboratory space, which is available to NRL researchers whose experiments are sufficiently demanding to require this space. There are 12 of these laboratories within the building. They provide shielding from electromagnetic interference, and very low floor vibration and acoustic levels. Eight of the laboratories control the temperature to within ±0.5 °C and four to within ±0.1 °C.

Major Research Capabilities and Facilities

- Clean room (5000 ft$^2$), quiet (4000 ft$^2$), and ultra-quiet (1000 ft$^2$) laboratories
- 35 dB and 25 dB acoustically isolated zones
- 20°C ± 0.5°C and 0.1°C controlled temperature zones
- Vibration isolation
  - Vertical (mm, pp) <0.1 @ 70–500 Hz
  - Horizontal (mm, pp) <0.1 @ 70–500 Hz
- Clean electrical power, free from SCR spikes and other interferences, and < ±10% voltage change
- <0.5 mG at 60 Hz EMI
- 45 ± 5% relative humidity
- Class 100 clean room
- Source of water meeting ASTM D5127 spec. Type E1.2

Clean Room Major Equipment
- Monitoring system (toxic gas, hazmat, temperature)
- Laminar flow wet benches for localized Class 1/10 ambient in clean room
- Air purification unit to remove local organic contamination
- DI water system
- Wire bonder
- Two electron-beam writers
- Two scanning electron microscopes
- Atomic force microscope
- Metallurgical optical microscopes
- 3D optical profiler
- Mask aligners (2, 1, and 0.2 µm)
- Electron beam evaporation systems
- Low pressure chemical vapor deposition (LPCVD) system
- Magnetron sputter deposition system
- Reactive ion etching systems
- Dual-beam focused ion beam workstation
- Optical pattern generating system
- Laser micromachining system
- Plasma-enhanced chemical vapor deposition (PECVD) system
- Plasma-enhanced atomic layer deposition system
- Chlorine reactive ion etching system
- 3D optical lithography system

Other Major Equipment
- Transmission electron microscope
- UHV multi-tip scanning tunneling microscope/nanomanipulator
- Aberration-corrected scanning transmission electron microscope
- He ion microscope
Mission Support Division

Code 1200

Director: Mr. T.B. Brewer

Point of Contact: Ms. N.M. White
Code 1202
(202) 767-6987

Key Personnel

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Code</th>
</tr>
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<tbody>
<tr>
<td>Mr. T.B. Brewer</td>
<td>Head, Mission Support Division</td>
<td>1200</td>
</tr>
<tr>
<td>Vacant</td>
<td>Deputy Head, Mission Support Division</td>
<td>1201</td>
</tr>
<tr>
<td>Ms. N.M. White</td>
<td>Administrative Officer</td>
<td>1202</td>
</tr>
<tr>
<td>Mr. K.A. Wheelock</td>
<td>Head, Stennis Space Center Security Staff</td>
<td>1203</td>
</tr>
<tr>
<td>Mr. C.D. Dodson</td>
<td>Head, Force Protection and Physical Security Branch</td>
<td>1210</td>
</tr>
<tr>
<td>Mr. J.D. Millard</td>
<td>Head, Information Assurance and Communications</td>
<td>1220</td>
</tr>
<tr>
<td></td>
<td>Security Branch</td>
<td></td>
</tr>
<tr>
<td>Mr. J.D. Millard*</td>
<td>Head, Information Security and Special Programs</td>
<td>1230</td>
</tr>
<tr>
<td>Ms. R.A. Proctor</td>
<td>Head, Personnel Security and Visitor Control Branch</td>
<td>1240</td>
</tr>
<tr>
<td>Mr. K.J. Pawlovich</td>
<td>Head, Safety Branch</td>
<td>1250</td>
</tr>
</tbody>
</table>

Personnel: 113 full-time civilian

*Acting

Basic Responsibilities

The Mission Support Division is responsible for NRL security and safety policy, management, and oversight. The Division Head serves as the NRL Security Manager and NRL Senior Intelligence Officer (SIO). Primary areas of security concern include cyber security, information security, personnel security, industrial security, classification management, foreign disclosure, physical security, force protection, antiterrorism, counter intelligence, operations security, communications security, and special security programs. In addition, the Division provides required security education across all security disciplines and conducts internal inspections for compliance with security-related governance. Primary areas of safety concern include safety and occupational health, explosives safety, and industrial hygiene programs. The Division is responsible for the development, implementation, and maintenance of comprehensive safety programs that support NRL research as well as ensuring NRL compliance with all appropriate federal, state, DoD, DON, and NRL regulations. The Division partners with other support and research Divisions to ensure that NRL's research is conducted in an appropriately secure and safe environment.
Military Support Division

Code 1400

**Head:** CDR J.K. Tran, USN

**Point of Contact:** LT T.J. Reichhart
Code 1410
(202) 767-2103

**Key Personnel**

<table>
<thead>
<tr>
<th>Name</th>
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<tr>
<td>CDR J.K. Tran, USN</td>
<td>Head, Military Support Division</td>
<td>1400</td>
</tr>
<tr>
<td>Ms. M.S. Braschler</td>
<td>Administrative Officer</td>
<td>1402</td>
</tr>
<tr>
<td>LT M. Greenlund, USN</td>
<td>Head, Military Administration/Personnel Branch</td>
<td>1410</td>
</tr>
<tr>
<td>YN1 N. Brown, USN</td>
<td>Administrative Yeoman</td>
<td>1410A</td>
</tr>
<tr>
<td>LT J. Chatfield, USN</td>
<td>Project Officer</td>
<td>1430</td>
</tr>
<tr>
<td>LT B. Bullen, USN</td>
<td>Project Officer</td>
<td>1430A</td>
</tr>
<tr>
<td>LT W.J. McCrone, USN</td>
<td>Project Officer</td>
<td>1430B</td>
</tr>
</tbody>
</table>

**Personnel:** 1 full-time civilian; 6 military

**Basic Responsibilities**

The Military Support Division provides military operational and administrative services to NRL. The Operations Branch assists NRL research directorates in planning and executing project flight missions, develops deployment schedules and military operational and training objectives, and coordinates the Research Reserve Program within NRL.

The Military Administration Branch is responsible for the coordination and efficient functioning of all military administrative operations for NRL (including site detachments). These duties specifically include: personnel actions, maintenance of personnel records, performance evaluations, awards and training; advising the Chief Staff Officer on manpower matters and organization issues; and preparing and administering the military operational budget.
Scientific Development Squadron ONE (VXS-1)

Code 1600

Commanding Officer: CDR E.M. Thomas, USN

Point of Contact: LT O.O. Abegunde, USN
Code 1610
(301) 995-4122

Key Personnel

CDR E.M. Thomas, USN  Commanding Officer, VXS-1  1600
CDR J.A. Tharp, USN  Executive Officer  1601
ATCS C.E. McCan, USN  Senior Enlisted Leader  1600.2
Vacant  Executive Secretary  1600.4
LT O.O. Abegunde, USN  Administrative Officer  1610
LT D.E. Miller, USN  Operations Officer  1630
LCDR M.M. McLean, USN  Projects Director  1630.1
LCDR C. Felice, USN  Maintenance Officer  1640
LT R.R. Clarida, USN  NATOPS/Training Officer  1670
Mr. S. Rorke  Projects Liaison Officer  1690

Personnel: 4 full-time civilian; 65 military

Staff Activity Areas

Projects Director
Operations
Safety/NATOPS/Training
Administration
Aircraft Maintenance
Quality Assurance
Project Liaison Officer
Basic Responsibilities

The Scientific Development Squadron ONE (VXS-1) located at NAS Patuxent River, Maryland, operates and maintains three uniquely configured P-3 Orion aircraft and one C-12 aircraft. Additionally, the squadron performs aircraft reporting custodian duties for nine Scan Eagle unmanned systems operating out of Dahlgren, Virginia, and will add a UV-18 Twin Otter to its aircraft inventory in 2018. The men and women of the squadron provide the Naval Research Laboratory with airborne research platforms, conducting flights worldwide in support of a broad spectrum of projects and experiments. These include magnetic variation mapping, electro-optic infrared research, hydroacoustic research, bathymetry, electronic countermeasures, gravity mapping, data link, and radar research. The squadron annually logs approximately 800 flight hours, and in its 52 year history, Scientific Development Squadron ONE (VXS-1) has amassed 73,000 hours of mishap-free flying.
Laboratory for Autonomous Systems Research
Code 1700

Director: Dr. K.S. Swider-Lyons

Point of Contact: Ms. D.E. Thorp
Code 1700
(202) 767-0653

*Additional Duty

Key Personnel

Dr. K.S. Swider-Lyons* Director, Laboratory for Autonomous Systems Research 1700
Mr. A. O’Hara Facilities Manager 1700
Ms. D.E. Thorp Financial and Administrative Management 1700

Personnel: 2 full-time civilian

*Additional Duty

Staff Activity Areas

Multidisciplinary research, development, and integration in autonomous systems, including:
Software for intelligent autonomy
Novel human-systems interaction technology
Mobility and platforms
Sensor systems
Power and energy systems
Networking and communications
Trust and assurance
Basic Responsibilities

The Laboratory for Autonomous Systems Research provides specialized facilities to support highly innovative, interdisciplinary research in autonomous systems, including software for intelligent autonomy, sensor systems, power and energy systems, human–systems interaction, networking and communications, and platforms and mobility. The Laboratory capitalizes on the broad multidisciplinary character of NRL, bringing together scientists and engineers with disparate training and backgrounds to advance the state of the art in autonomous systems at the intersection of their respective fields. The Laboratory provides unique facilities and simulated environments (littoral, desert, tropical) and instrumented reconfigurable high bay spaces to support integration of science and technology components into research prototype systems. The objective of the laboratory is to enable Naval and DoD scientific leadership in this complex, emerging area and to identify opportunities for advances in future defense technology.

The facility includes a Reconfigurable Prototyping High Bay that allows real-time, accurate tracking of many entities (vehicles and humans) for experimental ground truth. Small UAVs and ground vehicles can simultaneously operate within the large high bay, which is viewable from four adjacent Human–System Interaction labs. The Tropical High Bay emulates a rainforest with appropriate terrain and plants, and includes flowing water features. An outdoor Highland Forest provides an additional forest environment, and also includes interesting water and terrain features. The Desert High Bay provides a simulated desert environment featuring a sand pit, natural rock walls, and appropriate lighting and wind. The Littoral High Bay provides a simulated coastal environment featuring sediment tanks, large pool with a sloping floor, and small flow tanks. In addition to the environmental high bays, the facility also has a Power and Energy Laboratory, a Sensor Laboratory, and a mechanical and electrical shop.

The facility is open to use by all NRL scientists contributing to the science and technology of autonomous systems and will host many NRL scientists as needed.

Major Research Capabilities and Facilities

Prototyping High Bay: (150 ft by 75 ft by 30 ft), contains real-time motion capture system, directional environmental sounds, GPS repeater and simulator

Four human–systems interaction labs contain eye trackers and multiuser, multitouch monitors

Littoral High Bay with 45 ft by 25 ft by 5.5 ft deep pool with 16-channel wave generator and slope that allows simulation of littoral environments; multiple sediment tanks (from 5 ft to 16 ft); GPS repeater and simulator; portable tank 4 ft by 36 ft

Desert High Bay with a 40 ft by 14 ft area of sand 2.5 ft deep, and 18 ft high rock walls; high speed fans and variable lighting

Tropical High Bay, a 60 ft by 40 ft greenhouse, contains a re-creation of a southeast Asian rain forest with native plants; nominal 80 degrees temperature and 80% humidity; can generate rain events up to 6 in. per hour; Rainforest contains waterfall, stream, and pond

Outdoor test range is a 1/3 acre highland forest with a waterfall, stream and pond, and terrain of differing difficulty including large bolder structures and earthen berms

Sensor lab contains environmental chambers (small and walk-in) with maximum temperature range of −50°F to 375°F; relative humidity from 10% to 95% and for smaller chamber, barometric pressure of −9000 feet to 100,000 feet; lab also contains various fume hoods, biosafety cabinet, anechoic chamber, vapor generators, and other specialized equipment

Power and energy lab contains specialized equipment including a battery dry room, glove box, isolation room, and fume hoods
Human Resources Office
Code 1800
http://hroffice.nrl.navy.mil

**Director:** Ms. M.V. Kisamore

**Point of Contact:** Ms. R.A. Ward
Code 1802
(202) 404-2797

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### Key Personnel

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms. M.V. Kisamore</td>
<td>Director, Human Resources Office</td>
<td>1800</td>
</tr>
<tr>
<td>Ms. R.A. Ward</td>
<td>Administrative Officer</td>
<td>1802</td>
</tr>
<tr>
<td>Ms. M.V. Kisamore*</td>
<td>Head, Information Technology and Reports Office</td>
<td>1804</td>
</tr>
<tr>
<td>Ms. A.M. Slattery</td>
<td>Head, Personnel Operations Branch</td>
<td>1810</td>
</tr>
<tr>
<td>Ms. S.M. Cummings</td>
<td>Head, Employee Development and Management Branch</td>
<td>1840</td>
</tr>
<tr>
<td>Ms. L. Beck</td>
<td>Head, Employee Relations Branch</td>
<td>1850</td>
</tr>
</tbody>
</table>

*Acting

**Personnel:** 30 full-time civilian

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### Staff Activity Areas

- Personnel Operations (Staffing and Classification)
- Employee Relations
- Employee Development
- Compensation, Reports, and Demonstration Project
- Information Technology and Reports
- Manpower
Basic Responsibilities

The Human Resources Office (HRO) provides civilian personnel, manpower, and Equal Employment Opportunity (EEO) services to the Naval Research Laboratory. The Human Resources Program provides the full range of operating civilian personnel management in the staffing and placement, position classification, employee relations, labor relations, employee development, EEO functional areas, manpower management, and morale, welfare, and recreation programs.

The HRO at NRL’s main site in Washington, DC, services approximately 2,500 employees and provides a centralized capability to perform managerial, service, and advisory functions in support of field office operations. These include issuing policy and procedural directives; developing, designing, and maintaining automated systems; and monitoring and evaluating product effectiveness to develop and maintain efficient, cost-effective, service-oriented methods.
**Equal Employment Opportunity and Diversity Program Office**

**Code 1000.2**

eeo@nrl.navy.mil

---

**Key Personnel**

- **Ms. L.L. Hill** Director, EEO and Diversity Program Office
- **Ms. E.J. Fox** Administrative Assistant
- **Ms. L.M. Granados** EEO Officer
- **Ms. E.D. Garland** EEO Officer
- **Mr. R.J. Whittington** EEO Officer

**Personnel:** 5 full-time civilian

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**Staff Activity Areas**

- Informal/Formal Complaint Process • Accommodating Individuals with Disabilities
- Affirmative Employment Program

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**Basic Responsibilities**

Equal Employment Opportunity (EEO) is a fundamental NRL policy for all employees regardless of race, color, religion, national origin, sex (including pregnancy, gender identity and sexual orientation), age (40 years and over), disability (mental and physical), genetic information and reprisal (for participating in EEO activity). The NRL EEO and Diversity Program Office is a service organization whose major functions include counseling employees in an effort to resolve employee/management conflicts, processing formal discrimination complaints, handling requests for reasonable accommodations, providing accommodations, providing EEO training, and managing NRL's MD-715 affirmative employment program. The NRL EEO and Diversity Program Office is also responsible for sponsoring and recognizing special emphasis observances to promote awareness and increase sensitivity and appreciation of the issues or the history relating to females, individuals with disabilities and minorities.
Cyber Operations Division
Code 1900

**Director:** Mr. K.A. Rohwer

**Point of Contact:** Mr. K.A. Rohwer
Code 1900
(202) 767-9225

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**Key Personnel**

<table>
<thead>
<tr>
<th>Name/Title</th>
<th>Position</th>
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<tbody>
<tr>
<td>Mr. K.A. Rohwer</td>
<td>Director, Cyber Operations Division 1900</td>
</tr>
<tr>
<td>Vacant</td>
<td>Deputy Command Information Officer 1901</td>
</tr>
<tr>
<td>Ms. M.L. Walters</td>
<td>Administrative Officer 1902</td>
</tr>
<tr>
<td>LCDR S. Hudson, USN</td>
<td>Military Deputy 1905</td>
</tr>
<tr>
<td>Ms. M. Dowling</td>
<td>Head, Operational Networks and Communications Branch 1920</td>
</tr>
<tr>
<td>Mr. K.A. Rohwer*</td>
<td>Head, Desktop Support Branch 1940</td>
</tr>
<tr>
<td>Ms. D.K. Martin</td>
<td>Head, Information Systems Support Branch 1950</td>
</tr>
</tbody>
</table>

**Personnel:** 28 full-time civilian; 1 military

*Acting

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**Basic Responsibilities**

The Cyber Operations Division (COD) provides command-wide information technology (IT) leadership and standardization. The Division develops and implements policies related to all aspects of NRL's IT architectures, systems, and support personnel. The Division is specifically responsible for oversight and operation of command-wide networks and services including design, development, deployment, maintenance, and support of these systems. The Division works with Cybersecurity and Communications Security Branch (Code 1220) personnel on cybersecurity (CS) compliance issues, and provides appropriate guidance and direction to research division IT staffs. The Division is managed by the Director/Command Information Officer and the Director of Research on applicable IT policies, acquisition and management of IT resources, mission impact of statutory and regulatory IT requirements, preparation for IT inspections and assessments, and IT support manning. The Director/CIO supervises personnel within the Division and interfaces directly with external agencies on IT matters as needed.
Ruth H. Hooker Research Library

Code 5596

Chief Librarian: Ms. S.M. Ryder

Point of Contact: Ms. S.M. Ryder
Code 5596
(202) 767-2357

Key Personnel

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Ms. S.M. Ryder</td>
<td>Chief Librarian</td>
<td>5596</td>
</tr>
<tr>
<td>Ms. J.E. Griffin</td>
<td>Head, Research Reports and Bibliography Section</td>
<td>5596.3</td>
</tr>
<tr>
<td>Mr. J.C. Haesloop</td>
<td>Library IT Director</td>
<td>5596.5</td>
</tr>
</tbody>
</table>

Personnel: 21 full-time civilian

Basic Responsibilities

NRL’s Ruth H. Hooker Research Library supports NRL and ONR scientists in conducting their research by making a comprehensive collection of the most relevant scholarly information available and useable; by providing direct reference and research support; by capturing and organizing the NRL research portfolio; and by creating, customizing, and deploying a state-of-the-art digital library. Traditional library resources include extensive technical report, book, and journal collections dating back to the 1800s housed within a centrally located research facility that is staffed by subject specialists and information professionals. The collections include 44,000 books; 80,000 digital books; 80,000 bound historical journal volumes; more than 3,500 current journal subscriptions; and approximately 2 million technical reports in paper, microfiche, or digital format (classified and unclassified). Research Library staff members provide advanced information consulting; literature searches against all major online databases including classified databases; circulation of materials from the collection including classified literature up to the Secret level; and retrieval of articles, reports, proceedings, or documents through our interlibrary loan and document delivery network. The digital library provides desktop access to thousands of journals, books, proceedings, reports, databases, and reference sources.
The Business Operations Directorate provides executive management, policy development, and program administration for business programs needed to support the activities of the scientific directorates. This support is in the areas of financial management, supply management, technical information services, contracting, research and development services, and management information systems support.
Mr. Jay L. Cooper served as the Comptroller for the Office of Naval Research from March 2016 to October 2018 where he was directly responsible for the management and oversight of financial resources devoted to research, development, test and evaluation, and related activities of the DON. From November 2017 to November 2018, Mr. Cooper served as the Resource Manager for the NATO Resolute Support Mission while on deployment to Kabul, Afghanistan. Mr. Cooper and his staff of 150+ personnel conducted Train/Advise/Assist support to four cabinet level offices of the Afghan government responsible for Police and Army Security Forces. In December 2018, Mr. Cooper accepted the position as Associate Director of Research for Business Operations at the Naval Research Laboratory.

Mr. Cooper was appointed to the Senior Executive Service in April 2010. He has 29 years of Federal Service and seven years of service as a contractor in support of Navy fast attack submarines from 1982 to 1989.

Prior to ONR, from March 2010 to March 2016, Mr. Cooper served as the Director, Civilian Resources and Business Affairs in the Navy Comptroller’s office, OASN FM&C (FMB-4), where he was responsible for reviewing, recommending, and revising financial estimates for the Navy Working Capital Fund, civilian personnel, Information Technology, and contractor services for inclusion in the budget; to include justification of these estimates to OSD/OMB and the Congress. This equates to oversight of ~$57 billion and over 200,000 civilian personnel.

From September 2000 to April 2010, Mr. Cooper served as the Comptroller, Naval Facilities Engineering Command, Pacific, where he was responsible for management and execution of appropriated and Navy working capital funds in excess of $650M per year covering over 4,000 employees. Span of control extended from Hawaii to Japan, Thailand, Diego Garcia, Singapore, Korea, Philippines, and Guam.

Prior to 2000, Mr. Cooper held Comptroller positions with several other Navy shore installations, specifically Naval Computer and Telecommunications Area Master Station Pacific, Naval Station Guantanamo Bay Cuba, and Naval Training Center Orlando, Florida.

Mr. Cooper holds a B.S. degree in public administration from George Mason University. He is a recipient of the NATO non-Article 5 medal and the Joint Meritorious Civilian Service Award for service in support of NATO Operation Resolute Support. In addition, Mr. Cooper has three Meritorious Civilian Service Awards, one of which resulted from 12 months service in Al Anbar Province, Iraq, as part of the Department of State’s embedded Provincial Reconstruction Team initiative during 2007 to 2008. He has a Level 3 DoD FM Certification and is a prior American Society of Military Comptrollers member, Certified Defense Financial Manager, and Certified Government Financial Manager.
Key Personnel

Mr. J.L. Cooper  Associate Director of Research for Business Operations  3000
Ms. M.Q. Loften  Special Assistant  3001
Ms. K.C. Rice  Deputy Associate Director of Research for Business Operations  3002
Ms. K.P. Chappell  Deputy Director, Office of Small Business Programs  3005
Ms. P.W. Lowery  Head, Management Information Systems Office  3030
Mr. J.D. Coder  Enterprise Resource Planning (ERP) Business Systems Division  3100
Mr. C.S. Barton  Head, Contracting Division  3200
Mr. W.B. Sherer  Head, Financial Management Division/Comptroller  3300
Mr. B.W. Belcastro  Head, Supply and Administrative Services Division  3400
Mr. T.K. Hull, Jr.  Director, Research and Development Services Division  3500

Point of Contact: Ms. M.Q. Loften, Code 3001, (202) 404-7462

*Acting
Enterprise Resource Planning (ERP) Business Systems Division
Code 3100

Head: Mr. J.D. Coder

Point of Contact: Mr. J.D. Coder
Code 3100
(202) 404-1099

Key Personnel

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. J.D. Coder</td>
<td>Head, Enterprise Resource Planning (ERP) Business Systems Division</td>
<td>3100</td>
</tr>
<tr>
<td>Vacant</td>
<td>Deputy Head</td>
<td>3101</td>
</tr>
<tr>
<td>Ms. K.M. Budd</td>
<td>Administrative Officer</td>
<td>3102</td>
</tr>
<tr>
<td>Ms. S.R. Anderson</td>
<td>Head, Sustainment Operations Branch</td>
<td>3110</td>
</tr>
<tr>
<td>Mr. D.R. Twombly</td>
<td>Head, Functional Solutions Branch</td>
<td>3120</td>
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</table>

Personnel: 22 full-time civilian

Staff Activity Areas

- Navy ERP Process and Interface Monitoring
- Process Improvement for System Interactions
- End User Training
- Navy ERP-related Communications
- SAP Software Upgrade Support Activities
- Master Data Maintenance
- Trouble Ticket Resolution
- User Role Management
- Configuration and Release Management

Basic Responsibilities

The Enterprise Resource Planning (ERP) Business Systems Division is responsible for implementation, management, utilization, and operation of the Department of the Navy (DON) ERP system at NRL. DON ERP is the system of record for financial, materials, supply, acquisition, and some workforce functions. The Division facilitates system access, training, and usage of these functions for NRL personnel. It is responsible for implementation and sustainment of DON ERP functions within NRL which includes evaluation of required system hardware specifications, software, and networks; identification of required local system and application interfaces; coordination of required logistics actions to include business process changes, and user management and training; and engagement with the DON’s ERP Program Office, NAVSUP Business Solutions Center, Office of Naval Research ERP Business Office, DON ERP Center of Excellence, and other organizations.
Contracting Division

Key Personnel

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Code</th>
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<tbody>
<tr>
<td>Mr. C.S. Barton</td>
<td>Head, Contracting Division</td>
<td>3200</td>
</tr>
<tr>
<td>CDR G.A. Wright</td>
<td>Deputy Head</td>
<td>3201</td>
</tr>
<tr>
<td>Ms. K.P. Best</td>
<td>Administrative Officer</td>
<td>3202</td>
</tr>
<tr>
<td>Mr. B.W. Castleberry</td>
<td>Contracts Support Branch</td>
<td>3210</td>
</tr>
<tr>
<td>Ms. L.T. Kellstrom</td>
<td>Head, Contracts Branch 1</td>
<td>3220</td>
</tr>
<tr>
<td>Mr. M. Reiners</td>
<td>Head, Contracts Branch 2</td>
<td>3230</td>
</tr>
<tr>
<td>Ms. B.J. Green</td>
<td>Head, Contracts Branch 3</td>
<td>3240</td>
</tr>
<tr>
<td>Vacant</td>
<td>Team Lead, Contracts Section, SSC</td>
<td>3235</td>
</tr>
</tbody>
</table>

Personnel: 52 full-time civilian

Staff Activity Areas

- Advance Acquisition Planning
- Acquisition Strategies
- Acquisition Training
- Contract Negotiations
- Contractual Execution
- Contract Administration
- Acquisition Policy Interpretation and Implementation

Basic Responsibilities

The Contracting Division is responsible for the acquisition of major research and development materials, services, and facilities where the value is in excess of $150,000. It also maintains liaison with the ONR Procurement Directorate on procurement matters involving NRL. Specific functions include: providing consultant and advisory services to NRL division personnel on acquisition strategy, contractual adequacy of specifications, and potential sources; reviewing procurement requests for accuracy and completeness; initiating and processing solicitations for procurement; awarding contracts; performing contract administration and post-award monitoring of contract terms and conditions, delivery, contract changes, patents, etc., and taking corrective actions as required; providing acquisition-related training to division personnel; and interpreting and implementing acquisition-related Federal, Department of Defense, and Navy regulations.
Financial Management Division
Code 3300

Head: Mr. W.B. Sherer

Point of Contact: Ms. C.A. Hornig
Code 3302
(202) 767-6914

*Acting

Key Personnel

Mr. W.B. Sherer: Head, Financial Management Division/Comptroller 3300
Ms. C.A. Hornig: Administrative Officer 3302
Vacant: Financial Management Division/Assistant Comptroller 3303
Ms. E. Mitchell: Head, Financial Improvement and Audit Readiness Office 3305
Mr. E.L. Williams: Head, Budget and Funds Management Branch 3310
Ms. A.D. Kolbe: Head, Funding Section 3311
Ms. E.L. Williams: Head, Internal Budget Section 3312
Mr. W. Wong: Head, Corporate Budget Section 3313
Ms. S.V. Greenwell: Head, Financial Systems, Reports, and Accounting Branch 3350
Ms. L.L. Goodwin: Head, Cost Accounting Section 3351
Ms. L.L. Goodwin: Cost and Analysis Unit 3351.1
Ms. V.A. Reid: Head, Vendor Pay Unit 3351.2
Ms. L.D. Bowie: Head, Financial Services Section 3352
Ms. L.D. Bowie: Head, Payroll Services Unit 3352.1
Vacant: Head, Travel Services Unit 3352.2
Ms. S.V. Greenwell*: Head, Accounting Systems and Reports Section 3353
Ms. K.T. Lewis: Head, Asset Management and Accounting Section 3354

Personnel: 50 full-time civilian

*Acting

Staff Activity Areas

- Budget
- Payroll Liaison
- Reports and Statistics
- Audit Readiness
- Accounting
- Asset Management
- Travel Services
Basic Responsibilities

The Financial Management Division (FMD) is managed by the Head, Financial Management Division, who is designated the Naval Research Laboratory (NRL) Comptroller. The NRL Comptroller/Head of the FMD reports administratively to the SES Associate Director of Research for Business Operations, but maintains direct access to the Commanding Officer and Director of Research. The FMD develops, coordinates, and maintains an integrated system of financial management that provides the Commanding Officer, Director of Research, Associate Director of Research for Business Operations, and other NRL officials with the information and support needed to fulfill the financial and resource management aspects of their responsibilities. FMD translates NRL program requirements into the financial plan, formulates the NRL budget, monitors and evaluates performance with the budget plan, and provides recommendations and advice to NRL management for corrective actions or strategic program adjustments. FMD maintains the accounting records of NRL's financial and related resources transactions; and prepares reports, financial statements, and other documents in support of NRL management needs and/or to comply with external reporting requirements. FMD provides financial management guidance, policies, advice, and documented procedures to ensure that NRL operates in compliance with Navy and DoD regulations and with economy and efficiency. FMD coordinates efforts with the Defense Finance and Accounting Service (DFAS) to complete payment transactions related to NRL business (e.g., the payment of NRL personnel for payroll and travel expenses, and the payment to NRL's contractors and vendors for goods and services purchased by NRL). Additionally, FMD provides administrative support to the Management Information Systems (MIS) Office.

The Budget Branch prepares various financial analyses, reports, and studies in response to external data calls and/or management requests.

The Financial Systems, Reports, and Accounting Branch ensures that NRL's financial system satisfies user requirements and is in compliance with applicable rules and regulations, maintains official accounting records, and coordinates efforts with DFAS to complete payment transactions related to NRL business.
Supply and Administrative Services Division
Code 3400
https://pipeline.nrl.navy.mil/supply/

Supply Officer: Mr. B.W. Belcastro

Point of Contact: Ms. A.M. Olson
Code 3402
(202) 404-1701

Key Personnel

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Mr. B.W. Belcastro</td>
<td>Supply Officer</td>
<td>3400</td>
</tr>
<tr>
<td>Vacant</td>
<td>Deputy Supply Officer</td>
<td>3401</td>
</tr>
<tr>
<td>Ms. A.M. Olson</td>
<td>Administrative Officer</td>
<td>3402</td>
</tr>
<tr>
<td>Ms. D.M. Grimes</td>
<td>Head, Customer Support Staff</td>
<td>3403</td>
</tr>
<tr>
<td>Ms. P.J. Willis</td>
<td>Head, Purchasing Branch</td>
<td>3410</td>
</tr>
<tr>
<td>Mr. R.C. Taylor</td>
<td>Head, Material Control Branch</td>
<td>3450</td>
</tr>
<tr>
<td>Ms. S.E. Bethea</td>
<td>Head, Administrative Services Branch</td>
<td>3460</td>
</tr>
</tbody>
</table>

Personnel: 107 full-time civilian

Staff Activity Areas

- Purchasing
- Customer Support and Program Management
- Material Control
- Administrative Services
- Automated Internal Costing of Supplies
- Disposal and Storage
Basic Responsibilities

The Supply and Administrative Services Division provides the Laboratory and its field activities with contracting, supply management, logistics, and administrative services. Specific functions include: procuring required equipment, material, and services; receiving, inspecting, and delivering material and equipment; packing, shipping, and traffic management; surveying and disposing of excess and unusable property; operating various supply issue stores and performing stock inventories; providing technical and counseling services for the research directorates in the development of specifications for a complete procurement package; and obtaining and providing guidance in the performance stages of contractual services. Services also include mailroom services and correspondence management.
**Research and Development Services Division**

**Code 3500**

https://pipeline.nrl.navy.mil/rdservices/

**Director:** Mr. T.K. Hull, Jr.

**Point of Contact:** Ms. K.B. Spohn  
Code 3502  
(202) 404-4312

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**Key Personnel**

<table>
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<tr>
<th>Name</th>
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<tr>
<td>Mr. T.K. Hull, Jr.</td>
<td>Director, Research and Development Services Division</td>
<td>3500</td>
</tr>
<tr>
<td>Ms. K.B. Spohn</td>
<td>Administrative Officer</td>
<td>3502</td>
</tr>
<tr>
<td>Mr. G.L. Gray</td>
<td>Head, Customer Liaison Staff</td>
<td>3505</td>
</tr>
<tr>
<td>Mr. S.Y. Chan</td>
<td>Head, Support Services Branch</td>
<td>3520</td>
</tr>
<tr>
<td>Mr. H.W. Rolfs</td>
<td>Head, Chesapeake Bay Section</td>
<td>3522</td>
</tr>
<tr>
<td>Mr. E.T. Smith</td>
<td>Head, Shop Services Section</td>
<td>3523</td>
</tr>
<tr>
<td>Mr. U.E. Irby</td>
<td>Head, Production Control Section</td>
<td>3524</td>
</tr>
<tr>
<td>Ms. J. Cheswick</td>
<td>Head, Technical Services Branch</td>
<td>3530</td>
</tr>
<tr>
<td>Ms. J. Cheswick</td>
<td>Head, Engineering Section</td>
<td>3531</td>
</tr>
<tr>
<td>Mr. S.M. Tkacik</td>
<td>Head, Facilities, Planning and Operations Section</td>
<td>3535</td>
</tr>
<tr>
<td>Mr. D.R. Smith</td>
<td>Head, Environmental Section</td>
<td>3536</td>
</tr>
<tr>
<td>Ms. L. Jeffrieshunter</td>
<td>Head, Environmental Response Unit</td>
<td>3536.1</td>
</tr>
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</table>

**Personnel:** 130 full-time civilian
**Basic Responsibilities**

The Research and Development Services Division is responsible for the physical plant of the Naval Research Laboratory and subordinate field sites. The responsibilities include military construction, engineering, and coordination of construction; facility support services, planning, maintenance/repair/operation of all infrastructure systems; transportation; and environmental programs and permitting.

The Division provides engineering and technical assistance to research divisions in the installation and operation of critical equipment in support of the research mission.

**Staff Activity Areas**

- Engineering
- Production Control and Transportation
- Shop Services
- Chesapeake Bay Facilities Management
- Customer Liaison
- Environmental
- Utilities
- Telephones
- Facilities Planning and Operations

**Major Research Capabilities and Facilities**

- Military construction
- Research support engineering
- Planning
- Full range of facility contracting, including construction, architect/engineering services, facilities support, and reserved parking
- Transportation
- Telephone services
- Maintenance and repair of buildings, grounds, and communication and alarm systems
- Shops for machining, sheet metal, carpentry, and welding
- Environmental Program
The Systems Directorate applies the tools of basic research, concept exploration, and engineering development to expand operational capabilities and to provide materiel support to Fleet and Marine Corps missions. Emphasis is on technology, devices, systems, and know-how to acquire and move warfighting information and to deny these capabilities to the enemy. Current activities include:

- New and improved radar systems to detect and identify ever smaller targets in the cluttered littoral environment;
- Optical sensors and related materials to extract elusive objects in complex scenes when both processing time and communications bandwidth are limited;
- Unique optics-based sensors for detection of biochemical warfare agents and pollutants, for monitoring structures, and for alternative sensors;
- Advanced electronic support measures techniques for signal detection and identification;
- Electronic warfare systems, techniques, and devices including quick-reaction capabilities;
- Innovative concepts and designs for reduced observables;
- Techniques and devices to disable and/or confuse enemy sensors and information systems;
- Small intelligent teams of autonomous land, sea, and air vehicles to carry sensors, communications relays, or jammers;
- High performance/high assurance computers with right-the-first-time software and known security characteristics despite commercial off-the-shelf components and connections to public communications media; and
- Artificial intelligence and machine learning to enable more capable and intelligent decision aids.

Many of these efforts extend from investigations at the frontiers of science to the support of deployed systems in the field, which themselves provide direct feedback and inspiration for applied research and product improvement and/or for quests for new knowledge to expand the available alternatives.

In addition to its wide-ranging multidisciplinary research program, the Directorate provides support to the corporate laboratory in shared resources for high performance computing and networking, technical information collection and distribution, and in coordination of Laboratory-wide efforts in signature technology, counter-signature technology, Theater Missile Defense, and the Naval Science Assistance Program.
Dr. Gerald M. Borsuk is the Associate Director of Research for the Systems Directorate at NRL in Washington, DC. He provides executive direction and leadership to four major NRL research divisions that conduct a broad multi-disciplinary program of scientific research and advanced technological development in the areas of optics, electromagnetic warfare, information technology, and radar with combined funding in fiscal year 2017 of $510 million. He is responsible for the conduct and effectiveness of research programs performed within these divisions and for the overall administration of activities throughout the Systems Directorate. He is also the Focus Area Coordinator for all NRL Base programs in electronics science and technology.

Prior to his appointment as Associate Director of Research for Systems, Dr. Borsuk served for 23 years as the Superintendent of the Electronics Science and Technology Division at NRL, where he was responsible for the in-house execution of a multi-disciplinary program of basic and applied research in electronic materials and structures, solid state devices, nanometer scale electronics, vacuum electronics, and circuits. Prior to joining NRL, Dr. Borsuk served in the industrial sector for 17 years, first as a bench scientist and later as a manager of science and technology research. His last position in industry before joining NRL was as a science and technology manager at the Westinghouse Electric Corporation's (now Northrop-Grumman) Advanced Technology Laboratory in Baltimore, Maryland.

Dr. Borsuk received a doctorate in physics from Georgetown University in Washington, DC, in 1973. He is a Fellow of the IEEE. He has published in the literature and has been awarded several patents. He is the recipient of four Presidential Rank Senior Executive Awards, the most recent of which was the Distinguished Rank Award granted in 2010. Among his other recognitions for achievement, he is the recipient of the IEEE Frederik Philips Medal, the IEEE Harry Diamond Memorial Award, the IEEE Millennium Medal, and an IR-100 Award. Dr. Borsuk also served on the Editorial Board of the IEEE Proceedings for 18 years.
**Key Personnel**

Dr. G.M. Borsuk  
Associate Director of Research for Systems  
5000

Ms. L.L. Williams  
Special Assistant  
5001

Dr. M. White  
Special Consultant  
5007

Mr. M.F. Walder  
Superintendent, Radar Division  
5300

Dr. J.D. McLean  
Superintendent, Information Technology Division  
5500

Dr. C.A. Hoffman  
Superintendent, Optical Sciences Division  
5600

Dr. F.J. Klemm  
Superintendent, Tactical Electronic Warfare Division  
5700

**Point of Contact:** Ms. J.M. Stone, Code 5000A, (202) 767-3324
Radar Division
Code 5300

Superintendent: Mr. M.F. Walder

Point of Contact: Mr. M.F. Walder
Code 5300
(202) 404-8378

Key Personnel

Mr. M.F. Walder  Superintendent, Radar Division  5300
Mr. D.J. Cardiel  Associate Superintendent  5301
Ms. V. Short-Williams  Administrative Officer  5302
Mr. V. Gregers-Hansen  Head, AEGIS Coordinator Staff  5306
Dr. C.T. Rodenbeck  Head, Advanced Concepts Group  5307
Mr. T.J. Pizzillo  Head, Radar Analysis Branch  5310
Mr. G. Tavik  Head, Advanced Radar Systems Branch  5320
Dr. A. Shackelford  Head, Surveillance Technology Branch  5340

Personnel: 80 full-time civilian

Staff Activity Areas

Radar Systems Engineering
Shipboard and Airborne Radar Systems
Small Target Detection
Maritime Domain Awareness
Networked and Distributed Radar Concepts
Computational Electromagnetics
High Frequency Radar
Electronic Protection
Ultra-wideband Antennas
Multi-Function Systems
Millimeter-wave radar
Advanced Waveforms and Signal Processing
Radar Imaging
Basic Responsibilities

The Radar Division conducts research on basic physical phenomena of importance to radar and related sensors, investigates new engineering techniques applicable to radar, demonstrates the feasibility of new radar concepts and systems, performs related systems analyses and evaluation of radar, and provides special consultative services. The emphasis is on new and advanced concepts and technology in radar and related sensors that are applicable to enhancing the Navy’s ability to fulfill its mission.

Major Research Capabilities and Facilities

Shipboard radar research and development test beds:
- FlexDAR demonstration system (every element digital beamforming)
- AN/SPS-49-A(V)1
- S-Band radar waveform development testbed
- Electromagnetic Maneuver Warfare Testbed

Airborne research radar facility, AN/APS-137D(V)5

Airborne 94 GHz radar system

Radar signature calculation facility

Computational Electromagnetics facility

Compact range and near-field antenna measurement laboratory

Electronic Protection (EP) and adaptive pulse compression (APC) testbed

Electronics and mechanical computer aided design facility

High Frequency (HF) Multiple-Input Multiple-Output (MIMO) testbed

HF Surface Wave Radar Testbed

Microwave and RF instrumentation laboratories
### Key Personnel

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
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<tbody>
<tr>
<td>Dr. B.J. Cadwell</td>
<td>Superintendent, Information Technology Division</td>
<td>5500</td>
</tr>
<tr>
<td>Dr. B.J. Cadwell</td>
<td>Associate Superintendent</td>
<td>5501</td>
</tr>
<tr>
<td>Ms. A.W. Colpitts</td>
<td>Administrative Officer</td>
<td>5502</td>
</tr>
<tr>
<td>Vacant</td>
<td>Director, Navy Center for Applied Research in Artificial Intelligence</td>
<td>5510</td>
</tr>
<tr>
<td>Dr. P.M. Klein</td>
<td>Head, Networks and Communication Systems Branch</td>
<td>5520</td>
</tr>
<tr>
<td>Mr. S. Chincheck</td>
<td>Director, Center for High Assurance Computer Systems</td>
<td>5540</td>
</tr>
<tr>
<td>Mr. M.A. Rupar</td>
<td>Head, Transmission Technology Branch</td>
<td>5550</td>
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<tr>
<td>Mr. R. Mittu</td>
<td>Head, Information Management and Decision Architectures Branch</td>
<td>5580</td>
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<tr>
<td>Mr. B.A. Decina, Jr.</td>
<td>Director, Center for Computational Science</td>
<td>5590</td>
</tr>
<tr>
<td>Ms. S.M. Ryder</td>
<td>Chief Librarian, Ruth H. Hooker Research Library</td>
<td>5596</td>
</tr>
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</table>

**Personnel:** 212 full-time civilian

*Acting  *Additional Duty
Basic Responsibilities

The Information Technology Division conducts basic research, exploratory development, and advanced technology demonstrations in the collection, transmission, processing, presentation, and distribution of information to provide information superiority and distributed networked force capabilities that improve Naval operations across all mission areas. The Division provides immediate solutions to current operational needs as required while developing those technologies necessary to implement the Navy after next.

Research Activity Areas

Navy Center for Applied Research in Artificial Intelligence
Transmission Technology
Center for High Assurance Computer Systems
Networks and Communication Systems
Information Management and Decision Architectures
Center for Computational Science
Ruth H. Hooker Research Library
Configurable Synthetic and Merged Environment (CSME) Laboratory

Major Research Capabilities and Facilities

Extended Spectrum Experimentation Laboratory
Robotics and Autonomous Systems Laboratory
Immersive Simulation Laboratory
Warfighter Human-Systems Integration Laboratory
Audio Laboratory
Mobile and Dynamic Network Laboratory
Integrated Communications Technology Test Lab
General Electronics Environmental Test Facility
Key Management Laboratory
Crypto Technology Laboratory
Navy Cyber Defense Research Laboratory
Communications Security (COMSEC) Laboratory
Navy Shipboard Communications Testbed
Behavior Detection Laboratory
Virtual Reality Laboratory
Service Oriented Architecture Laboratory
Distributed Simulation Laboratory
Motion Imagery Laboratory
Laboratory for Large Data Research
Affiliated Resource Center for High Performance Computing
Ruth H. Hooker Research Library
Optical Sciences Division

Key Personnel

Dr. C.A. Hoffman  Superintendent, Optical Sciences Division  5600
Dr. J.M. Nichols  Associate Superintendent  5601
Ms. C. Woods  Administrative Officer  5602
Dr. J.R. Meyer  Head, Senior Scientific Staff  5604
Dr. B.L. Justus  Head, Optical Physics Branch  5610
Dr. J.S. Sanghera  Head, Optical Materials and Devices Branch  5620
Dr. K.J. Williams  Head, Photonics Technology Branch  5650
Mr. D.C. Linne von Berg  Head, Applied Optics Branch  5660
Dr. A. Dandridge  Head, Optical Techniques Branch  5670

Personnel: 136 full-time civilian

Staff Activity Areas

Program analysis and development
Special systems analysis
Technical study groups
Technical contract monitoring
Theoretical studies

Research Activity Areas

Optical Materials
Lasers and other Optical Sources
Organic and Inorganic Opto-Electronics
Visible and Infrared Imaging and Image Processing
RF and Integrated Photonics
Fiber Optic Sensing
Optical System Development
Basic Responsibilities

The Optical Sciences Division carries out a variety of research, development, and application-oriented activities in the generation, propagation, detection, and use of radiation in the wavelength region between near-ultraviolet and far-infrared wavelengths. The research, both theoretical and experimental, is concerned with discovering and understanding the basic physical principles and mechanisms involved in optical devices, materials, and phenomena. The development effort is aimed at extending this understanding in the direction of device engineering and advanced operational techniques. The applications activities include systems analysis, prototype system development, and exploitation of R&D results for the solution of optically related military problems. In addition to its internal program activities, the Division serves the Laboratory specifically and the Navy generally as a consulting body of experts in optical sciences. The work in the Division includes studies in quantum optics, laser physics, optical waveguide technologies, laser–matter interactions, atmospheric propagation, holography, optical data processing, fiber-optic sensor systems, optical systems, optical materials, radiation damage studies, IR surveillance and missile seeker technologies, IR signature measurements, and optical diagnostic techniques. A portion of the effort is devoted to developing, analyzing, and using special optical materials.

Major Research Capabilities and Facilities

- Optical probes laboratory to study viscoelastic, structural, and transport properties of molecular systems
- Short-pulse excitation apparatus for kinetic mechanisms investigations
- IR laser facility for optical characterization of semiconductors
- Facilities for synthesis and characterization of optical glass compositions and for the fabrication of optical fibers
- Silica and IR fluoride/chalcogenide fiber fabrication facilities
- Environmental testing of fiber sensors (acoustic, magnetic, electric field, etc.)
- Mid-IR, low-phonon crystal growth facility
- Infrared countermeasure techniques laboratory
- Mobile, high-precision optical tracker
- EO/IR technology/systems modeling and simulation capabilities
- Field-qualified EO/IR measurement devices
- Focal plane array evaluation facility
- Facilities for fabricating and testing integrated optical devices
- Panchromatic and multi- and hyperspectral digital imaging processing facilities
- NRL P-3 aircraft sensor pallet
- Airborne EO/IR and radar sensors
  - VNIR through SWIR hyperspectral systems
  - VNIR, MWIR, and LWIR high-resolution systems
- Wideband SAR systems
- RF and laser data links
- High-speed, high-power photodetector characterization
- Communication link characterization to >100 Gbps
- RF phase noise, noise figure, and network analysis
- Ultrahigh-speed A/O converters
- Bio-aerosol containment chamber for testing the limits of new optical detection strategies
Tactical Electronic Warfare Division
Code 5700

Superintendent: Dr. F.J. Klemm

Point of Contact: Mr. G.K. Weissbach
Code 5701
(202) 767-5937

Key Personnel

Dr. F.J. Klemm  Superintendent, Tactical Electronic Warfare Division  5700
Dr. J. Heyer  Senior Scientist for Electronic Warfare Technologies  5700.1
Mr. G.K. Weissbach  Associate Superintendent  5701
Ms. J.C. Johnson  Administrative Officer  5702
Mr. G.K. Weissbach  Head, Electronic Warfare Lead Laboratory Staff  5705
Mr. E.M. Van Meter  Electronic Warfare Operations and Liaison Organization  5706
Dr. D.L. Smith*  Head, Signature Technology Office  5708
Mr. J.G. Durbin  Head, Offboard Countermeasures Branch  5710
Dr. T.A. Roberts  Head, Electronic Warfare Support Measures Branch  5720
Mr. M.S. Spath  Head, Aerospace Electronic Warfare Systems Branch  5730
Mr. M.J. Monsma  Head, Surface Electronic Warfare Systems Branch  5740
Dr. J.M. Auxier  Head, Advanced Techniques Branch  5750
Mr. T.R. Willats  Head, Integrated Electronic Warfare Simulation Branch  5760
Mr. J.Q. Binford  Head, Electronic Warfare Modeling and Simulation Branch  5770

Personnel: 269 full-time civilian
*Acting

Staff Activity Areas

EW Strategic Planning
Signature Technology Office
Effectiveness of Naval EW Systems (ENEWS)
Electronic Warfare Operations Research and Liaison Organization
Basic Responsibilities

The Tactical Electronic Warfare Division (TEWD) is responsible for research and development in support of the Navy’s tactical electronic warfare requirements and missions. These include electronic warfare support measures, electronic countermeasures, and supporting counter-countermeasures, as well as studies, analyses, and simulations for determining and improving the effectiveness of these systems.

Research Activity Areas
Signature Analysis
Offboard Countermeasures
Electronic Warfare Support Measures
Aerospace Electronic Warfare Systems
Surface Electronic Warfare Systems
Advanced Techniques
Integrated EW Simulation
EW Modeling and Simulation

Major Research Capabilities and Facilities
Visualization display room
Transportable step frequency radar
Vehicle development laboratory
Offboard test platform
Compact antenna range facility
Millimeter-Wave Antenna Range Facility
TEWD Mechanical Fabrication Shop
RFCM techniques development chamber facility
Low-power anechoic chamber
High-power microwave research facility
Electro-optics mobile laboratory
Infrared-electro-optical calibration and characterization laboratory
Infrared missile simulator and simulator development laboratory
Secure supercomputing facility
CBD/Tilghman Island IR field evaluation facility
Ultrashort pulse laser effects research and analysis laboratory
Central Target Simulator facility
Flying Electronic Warfare laboratory
High-power RF explosive laboratory
Classified material lay-up facility
Classified computing facilities
RF measurement laboratory
Wet chemistry laboratory
Ultra-near-field test facility
RF and millimeter-wave laboratory
Optical laboratory
Paint room
Secure laboratories for classified projects
Offboard Test Platform (Wind Tunnel)
Near and Far Field Antenna Measurement Facility
Materials Science and Component Technology Directorate

Code 6000

The Materials Science and Component Technology Directorate carries out a multidisciplinary research program whose objectives are the discovery, invention, and exploitation of new improved materials, the generation of new concepts associated with materials behavior, and the development of advanced components based on these new and improved materials and concepts. Theoretical and experimental research is carried out to determine the scientific origins of materials behavior and to develop procedures for modifying these materials to meet important naval needs for advanced platforms, electronics, sensors, and photonics.

The program includes investigations of a broad spectrum of materials including insulators, semiconductors, superconductors, metals and alloys, optical materials, polymers, plastics, artificially structured biomolecular materials and composites, and energetic materials, which are used in important naval devices, components, and systems. New techniques are developed for producing, processing, and fabricating these materials for crucial naval applications.

The synthesis, processing, properties, and limits of performance of these new and improved materials in natural or radiation environments, and under deleterious conditions such as those associated with the marine environment, neutron or directed energy beam irradiation, or extreme temperatures and pressures, are established. For new materials design, emphasis is placed on protection of the environment.

Additionally, major thrusts are directed in advanced sensing, detection, reactive flow physics, computational physics, and plasma sciences. Areas of particular emphasis include nanoscience and technology, fluid mechanics and hydrodynamics, nuclear weapon effects simulations, high energy density materials including fuels, propellants, explosives, and storage devices, interactions of various types of radiation with matter, survivability of materials and components, and directed energy devices.
Dr. Peter Matic is the Associate Director of Research for Materials Science and Component Technology and the Superintendent of the Materials Science and Technology Division. His responsibilities include the direction and leadership of the scientists, engineers, and staff pursuing multidisciplinary discovery, invention, and innovation of new materials, devices, and system concepts for the Navy, the Marine Corps, and DoD agencies.

Dr. Matic was appointed to the Senior Executive Service in August 2013 after 28 years of federal service at NRL. He earned a B.S. degree in mechanical engineering from the Illinois Institute of Technology and a Ph.D. in applied mechanics from Lehigh University.

His NRL career experience includes 13 years as the Branch Head for Multifunctional Materials, two years as the Section Head for Physical and Computational Analysis, six years as the Section Head for Fracture Mechanics, and seven years as a Mechanical Engineer in the Fracture Mechanics Section at NRL. Prior to joining NRL, Dr. Matic was a Senior Engineer at the Electric Boat Division of the General Dynamics Corporation.

His awards include the Navy Superior Civilian Service Award in 2006, NRL Review Publication Award in 2004, NRL Technology Transfer Royalty Award for Innovation in 2003, American Society of Naval Engineers and Jimmie Hamilton Best Paper Award in 1989, and NRL Alan Berman Research Publication Award in 1989.

Dr. Matic has over 45 refereed publications and proceedings, over 50 contributed conference proceedings, over 70 invited and contributed presentations, over 20 technical reports, and four patents. He has taught graduate and undergraduate courses as an adjunct faculty member at The George Washington University and is a member of Sigma Xi.
Key Personnel

Dr. P. Matic                  Associate Director of Research for Materials Science and Component Technology 6000
Mr. R.A. Wynter               Special Assistant 6001
Dr. J.P. Boris                Chief Scientist for Computational Physics and Fluid Dynamics 6003
Dr. D.R. Mott*               Director, Laboratories for Computational Physics and Fluid Dynamics 6040
Dr. J.N. Russell, Jr.         Superintendent, Chemistry Division 6100
Dr. K. Bussmann/Dr. V.G. DeGiorgi/  
   Dr. A. Piqué†               Superintendent, Materials Science and Technology Division 6300
Dr. T.A. Mehlhorn             Superintendent, Plasma Physics Division 6700
Dr. B. Levush                 Superintendent, Electronics Science and Technology Division 6800
Ms. A.W. Kusterbeck†         Director, Center for Bio/Molecular Science and Engineering 6900

Point of Contact: Ms. D.L. Gray, Code 6000, (202) 767-2538

*Acting  †Additional duty
Laboratories for Computational Physics and Fluid Dynamics
Code 6040

**Director:** Dr. D.R. Mott*

**Point of Contact:** Ms. C. Collier
Code 6040.2
(202) 767-8713

*Acting

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**Key Personnel**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Laboratory</th>
<th>Code</th>
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<tbody>
<tr>
<td>Dr. D.R. Mott*</td>
<td>Director, Laboratories for Computational Physics and Fluid Dynamics</td>
<td>6040</td>
</tr>
<tr>
<td>Ms. C. Collier</td>
<td>Administrative Officer</td>
<td>6040.2</td>
</tr>
<tr>
<td>Dr. J.P. Boris</td>
<td>Chief Scientist for Computational Physics and Fluid Dynamics</td>
<td>6003</td>
</tr>
<tr>
<td>Dr. R. Ramamurti</td>
<td>Head, Laboratory for Propulsion, Energetic, and Dynamic Systems</td>
<td>6041</td>
</tr>
<tr>
<td>Dr. G. Patnaik</td>
<td>Head, Laboratory for Advanced Computational Physics</td>
<td>6042</td>
</tr>
<tr>
<td>Dr. D.R. Mott</td>
<td>Head, Laboratory for Multiscale Reactive Flow Physics</td>
<td>6043</td>
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**Personnel:** 22 full-time civilian

*Acting

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**Research Activity Areas**

- Reactive Flows
- Computational Physics Developments
- Military Aircraft Noise Reduction
- Naval Air Propulsion
Basic Responsibilities

The Laboratories for Computational Physics and Fluid Dynamics (LCP&FD) are responsible for the research leading to and the application of advanced analytical and numerical capabilities that are relevant to NRL, Navy, DoD, and other Government agencies. This research is pursued in the fields of compressible and incompressible fluid dynamics, reactive flows, fluid/structure interactions including submarine and aerospace applications, atmospheric and solar geophysics, magnetoplasma dynamics, application of parallel processing to large-scale problems such as unsteady flows of contaminants in and around cities, advanced propulsion concepts, flame dynamics for shipboard fire safety, jet noise reduction, and other disciplines of continuum computational physics as required to further the overall mission of NRL. The specific objectives of the LCP&FD are to develop and maintain state-of-the-art analytical and computational capabilities in fluid dynamics and related fields of physics; to establish in-house expertise in parallel processing for large-scale scientific computing; to perform analyses and computational experiments on specific relevant problems using these capabilities; and to transfer this technology to new and ongoing projects through cooperative programs with the research Divisions at NRL and elsewhere.

Major Research Capabilities and Facilities

1120 Core Intel Cluster
1152 core AMD cluster
420 core Intel Core i7 Cluster with 88 Nvidia GPUs
256 Core Intel Core i7 Cluster with 16 NVIDIA GPUs, 70 Xeon Phis
136 Core Many-Core Platform with 136 Xeon Phis
More than 50 Apple and Intel workstations
200 TB RAID storage system
All computers have network connections to NICENET, allowing access to the NRL CCS facilities (including DoD HPC resources) and many other computer resources internal and external to NRL.
Chemistry Division

Superintendent: Dr. J.N. Russell, Jr.

Point of Contact: Ms. M. Walters
Code 6102
(202) 767-2460

Key Personnel

Dr. J.N. Russell, Jr.  Superintendent, Chemistry Division  6100
Dr. W.W. Schultz  Associate Superintendent  6101
Ms. V.L. Rollins  Administrative Officer  6102
Dr. C.M. Roland  Senior Scientist for Soft Matter Physics  6105
CAPT S. Newell, USN  Biotechnology Program Manager  6106
Dr. G.E. Collins  Head, Chemical Dynamics and Diagnostics Branch  6110
Dr. J.H. Wynne*  Head, Materials Chemistry Branch  6120
Mr. E.J. Lemieux  Head, Center for Corrosion Science and Engineering  6130
Dr. K.J. Wahl*  Head, Surface Chemistry Branch  6170
Dr. S.L. Rose-Pehrsson  Head, Navy Tech Center for Safety and Survivability  6180

Personnel: 137 full-time civilian; 3 military; 1 intermittent; 1 part-time

*Acting

Research Activity Areas

Chemical Diagnostics
Materials Chemistry
Center for Corrosion Science and Engineering
Surface/Interface Chemistry
Safety and Survivability
Basic Responsibilities

The Chemistry Division conducts basic research, applied research, and development studies in the broad fields of chemical/structural diagnostics, reaction rate control, materials chemistry, surface and interface chemistry, corrosion passivation, environmental chemistry, and ship safety/survivability. Specialized programs within these fields include coatings, functional polymers/elastomers, clusters, controlled release of energy, physical and chemical characterization of surfaces, electrochemistry, assembly and properties of nanometer structures, tribology, chemical vapor deposition/etching, atmosphere analysis and control, environmental protection/reclamation, prevention/control of fires, mobility fuels, modeling/simulation, and miniaturized sensors for chemical, biological, trace analysis and data fusion, and explosives.

To enhance protection of Navy personnel and platforms from damage and injury in peace and wartime, the Navy Technology Center for Safety and Survivability performs RDT&E on fire and personnel protection, fuels, chemical defense, submarine atmospheres, and damage control aspects of ship and aircraft survivability; supports Navy and Marine Corps requirements in these areas; and acts as a focus for technology transfer in safety and survivability.

To address problems in corrosion and marine fouling, a Marine Corrosion Facility is located in Key West, Florida. This laboratory resides in an unparalleled site for natural seawater exposure testing and marine related materials evaluation. The tropical climate is ideal for marine exposure testing. Along with the high quality seawater, the location provides small climatic variation and a stable biomass throughout the year.

Major Research Capabilities and Facilities

Synthesis/processing facilities
- Paint formulation and coating
- Functional polymers/elastomers/composites
- Nanotubes/Nanofibers
- Surface modification
- Thin film deposition/etching with in situ control

Marine Corrosion Facility (at Key West, Florida)
Fire/Damage Control Test Facility (at Chesapeake Beach, Maryland)
Wave pool (at Mobile, Alabama)
Small boat test platforms (at Mobile, Alabama)

Characterization facilities
- General-purpose chemical analysis/trace analysis
- Surface diagnostics
- Nanometer scale composition/structure properties
- Magnetic resonance NDI
- Tribology
- Polymer structure/function/dynamics

Special-purpose capability
- Environmental monitoring/remediation
- Combustion and fire research
- Alternate and petroleum-derived fuels
- Trace explosive detection test beds
- Trace vapor generation and detection test beds
- Simulation/modeling
- Pressurized test chambers (small, medium, large)
Materials Science and Technology Division

Code 6300

Superintendent: Dr. K. Bussmann/Dr. V.G. DeGiorgi/Dr. A. Piqué*

Point of Contact: Ms. S.L. Willett
Code 6302
(202) 767-2458

*Additional duty

Key Personnel

Dr. K. Bussmann/Dr. V.G. DeGiorgi/
Dr. A. Piqué*  
Superintendent, Materials Science and Technology Division 6300

Dr. B.T. Jonker  
Senior Scientist 6300.1

Dr. K.M. Bussmann  
Associate Superintendent 6301

Ms. S.L. Willett  
Administrative Officer 6302

Mr. J.H. O’Donnell  
Head, Special Projects Group 6304

Dr. V.G. DeGiorgi  
Head, Multifunctional Materials Branch 6350

Dr. A. Piqué  
Head, Materials and Systems Branch 6360

Dr. S.C. Erwin  
Head, Center for Materials Physics and Technology 6390

Personnel: 93 full-time civilian

*Additional duty

Research Activity Areas

Fundamental Materials and Physics
Density functional theory, molecular dynamics and multiphysics simulations, quantum dots, spintronics, and surface and interface physics

Materials-based Concepts and Devices
Chemical and explosive detection, magneto-optic sensors, laser direct write, nonlinear dynamics, and advanced alloys

Extreme Environment Multiphysics
Corrosion, electromagnetic launch, warfighter protection, additive manufacturing, and joining technology

Materials for Energy
Fuel from seawater, battery and fuel cell materials, multiferroic energy harvesting, thermo-electric ceramics, and superconductor technologies

Materials Informatics
3D materials science, multiscale simulation, atom probe tomography, TEM, SEM, tomography, and IR characterization

Biology and Materials
Neuronal networks, single-cell process measurements, cell healing mechanisms, protein modeling in solution, and biomechanical modeling
Basic Responsibilities

The Materials Science and Technology Division conducts basic and applied research in functional and structural materials and engages in exploratory and advanced development to generate new Navy technologies and defense capabilities. The Division efforts encompass metals, ceramics, polymers, composites, and biological materials for electrical, magnetic, optical, plasmonic, chemical, mechanical, and energy technologies. Major Division focus areas include fundamental material physics, innovative device design, performance in extreme environments, power and energy, materials informatics, and the interface between materials and biology. These efforts are performed by multidisciplinary teams of materials scientists, physicists, chemists, and engineers working at the atomic, nano, microstructural, mesostructural, and macroscopic scales. The integrated use of new experimental and computational techniques accelerates new scientific understanding and innovative engineering solutions. Advanced materials synthesis, processing, characterization, diagnostic capabilities, performance prediction methods, and life-cycle management methods are developed to further new device design, prototyping, and testing methods.

Major Research Capabilities and Facilities

Synthesis and Processing
- Hot and cold isostatic presses
- Isothermal heat treating facility
- Vacuum arc melting facility
- Rapid Solidification System
- Composites processing autoclave
- Film deposition by thermal/sputter/MBE/PLD/MOCVD/aerosol/ALD
- 2D materials: graphene, MoS$_2$, other TMDs
- Parylene coater
- Laser direct write system
- 3D-printing of polymers
- Polymer extruder, synthesis and characterization
- Channel reactors for fuels synthesis
- Laser cutting facility
- Biomechanical surrogate fabrication

Physical & Structural Property Characterization
- Conductive AFM/MFM
- Vibrating sample & SQUID magnetometry
- Magneto–transport characterization 1.5K–400K, 9T
- Analytical transmission electron microscopy
- Atomic–resolution scanning TEM
- Scanning electron microscopy with EDS, EBSD and automated robotic serial sectioning system
- Variable–pressure SEM
- Dual–beam focused ion beam system
- Atom probe tomography (LEAP)
- SIMS–SSAMS mass spectrometry for sub-ppb elemental characterization
- Quantitative metallography

Thermal analysis characterization suite (TGA/DSC DMA/DEA/rheometer)
- Dielectric characterization facility
- Microwave device test facility
- Bomen infrared spectrometer facility
- Diffuse light scattering facility
- Femtosecond laser facility
- Magneto–electric materials characterization
- Gas chromatography
- X-ray computed microtomography with DCT
- X-ray diffractometers, powder and 4-circle
- Contact angle and surface tension analyzer
- LEED/RHEED/XPS/Auger characterization

Mechanical Property Characterization
- Robotic multiaxial loading system
- Stress corrosion cracking measurement systems
- Computer-aided experimental stress analysis
- 2D and 3D strain imaging and measurement
- Material drop tower test facility
- Helmet drop tower test facility
- Shock tube
- Gas gun

Imaging, Modeling, and Simulation
- High speed video and infrared cameras
- Quantum cascade lasers
- Live biological cell confocal imaging and manipulation system
- Live biological cell mechanical loading system
- High performance computer clusters
Plasma Physics Division

Superintendent: Dr. T.A. Mehlhorn

Point of Contact: Dr. T.A. Mehlhorn
Code 6700
(202) 767-2723

Key Personnel

Dr. T.A. Mehlhorn  Superintendent, Plasma Physics Division 6700
Dr. R.F. Hubbard  Associate Superintendent 6701
Ms. T.G. Santos  Administrative Officer 6702
Dr. A.L. Velikovich  Senior Scientist, Radiation Physics and High Energy Density Materials 6705
Dr. G.I. Ganguli  Senior Scientist, Intense Particle Beams and Plasma Processes 6709
Dr. J.L. Giuliani, Jr.  Head, Radiation Hydrodynamics Branch 6720
Dr. S.P. Obenschain  Head, Laser Plasma Branch 6730
Dr. W.E. Amatucci  Head, Charged Particle Physics Branch 6750
Dr. J.W. Schumer  Head, Pulsed Power Physics Branch 6770
Dr. J.R. Penano  Head, Beam Physics Branch 6790

Personnel: 90 full-time civilian

Research Activity Areas

Radiation Hydrodynamics
Laser Plasma
Charged Particle Physics
Pulsed Power Physics
Beam Physics
Basic Responsibilities

The Plasma Physics Division conducts a broad theoretical and experimental program of basic and applied research in plasma physics, laboratory discharge, and space plasmas, intense electron and ion beams and photon sources, atomic physics, pulsed power sources, laser physics, advanced spectral diagnostics, and nonlinear systems. The effort of the Division is concentrated on a few closely coordinated theoretical and experimental programs. Considerable emphasis is placed on large-scale numerical simulations related to plasma dynamics; ionospheric, magnetospheric, and atmospheric dynamics; nuclear weapons effects; inertial confinement fusion; atomic physics; plasma processing; nonlinear dynamics and chaos; free electron lasers and other advanced radiation sources; advanced accelerator concepts; and atmospheric laser propagation. Areas of experimental interest include laser–plasma, laser–electron beam, and laser–matter interactions, high-energy laser weapons, laser shock hydrodynamics, thermonuclear fusion, electromagnetic wave generation, the generation of intense electron and ion beams, large-area plasma processing sources, electromagnetic launchers, high-frequency microwave processing of ceramic and metallic materials, advanced accelerator development, inductive energy storage, laboratory simulation of space plasma phenomena, high-altitude chemical releases, and in situ and remote sensing space plasma measurements.

Major Research Capabilities and Facilities

Pulsed Power
- Mercury: 6 MV, 360 kA, magnetically insulated inductive voltage adder
- Gamble II: 1 MV, 1 MA pulsed power generator
- HAWK: 1 MA inductive storage facility
- Railgun Materials Testing Facility
- Small Railgun (SRG)

Inertial Confinement Fusion and High Energy Density Physics
- NIKE krypton fluoride laser facility
- ELECTRA: repetitive-pulsed electron beam and excimer laser facility
- Z-pinch and plasma radiation source modeling

Space Plasmas
- Space Physics Simulation Chamber
- Ionospheric sensing, modification, and modeling
- Radiation belt physics
- Solar physics and space weather

Directed Energy and Active Sensing
- MATRICS ultrafast laser facility (sources spanning wavelength range from ultraviolet to far infrared)
- Directed Energy Physics Facility (fiber lasers for weapons and power beaming applications)
- Remote underwater laser acoustics system (RULAS)
- SWOrRD: Swept-Wavelength Optical resonant Raman Device
- High-power microwave sources

Materials Processing and Related Applications
- Plasma Applications Laboratory (low temperature plasmas at atmospheric and reduced pressures)
- Microwave facility for processing of advanced materials
- Plasma chemistry modeling and applications

Nonlinear Dynamics and Applied Mathematics
- Autonomous swarm behavior
- Coupled systems with delay
Electronics Science and Technology Division
Code 6800
elecinfo@nrl.navy.mil

Superintendent: Dr. B. Levush

Point of Contact: Ms. C. McConnell
Code 6802
(202) 767-3416

Key Personnel

Dr. B. Levush  Superintendent, Electronics Science and Technology Division  6800
Dr. J.M. Pond  Associate Superintendent  6801
Ms. C.A. McConnell  Administrative Officer  6802
Vacant  Theoretical Consultant  6807
Dr. T.L. Reinecke  Senior Scientist for Nanoelectronics  6877
Dr. J.G. Tischler  Head, Optoelectronics and Radiation Effects Branch  6810
Dr. D.K. Abe  Head, Electromagnetics Technology Branch  6850
Dr. E.S. Snow  Head, Physics of Electronic Materials Branch  6870
Dr. F.J. Kub  Head, High Power Electronics Branch  6880

Personnel: 107 full-time civilian

Research Activity Areas

Quantum Information Science and Technology
Nanoelectronics
Surface and Interface Sciences
Electronic Materials Growth, Characterization, and Processing
Theoretical and Computational Electronics and Electromagnetics
Power Electronics
Microwave, Millimeter, and Submillimeter Wave Solid State and Vacuum Electronics Technologies
Optoelectronics
Photovoltaics
Radiation Effects
Basic Responsibilities

The Electronics Science and Technology Division conducts programs of basic science and applied research and development. Our technically diverse staff of experimental, theoretical, and computational physicists, surface and materials scientists, chemists, and electrical, electronic, chemical and mechanical engineers reflects the multidisciplinary nature of the Division’s research. The synergy that results from the collaboration between these experts ensures the development of world-class electronics science and technology. Our well-equipped laboratories and unique fabrication facilities provide the research tools needed to move rapidly from a flash of inspiration to real-world demonstration. In-house efforts include research and development in the following areas: quantum information science and technology; nanoelectronics; surface and interface sciences; electronics material growth, characterization, and processing; theoretical and computational electronics and electromagnetics; power electronics; microwave, millimeter-wave, and submillimeter-wave solid-state and vacuum electronics technologies; optoelectronics; photovoltaics; radiation effects.

Major Research Capabilities and Facilities

Compound Semiconductor Processing Facility
Laboratory for Advanced Materials Synthesis
Center for Advanced Materials Epitaxial Growth and Characterization (Epicenter)
Electronic Transport Laboratory
Advanced Silicon Carbide Epitaxial Research Laboratory
Solar Cell Characterization Laboratory
Ultrafast Laser Facility
Ultraviolet Photolithography Laboratory for Submillimeter-Wave Devices
Millimeter-Wave Vacuum Electronics Fabrication Facility
Solid-State Qubit Coherent Spectroscopy Laboratory
3D Laser Lithography Laboratory
Optoelectronic Scanning Electron Characterization Facility
Infrared Materials and Detectors Characterization Laboratory
Atomic Layer Deposition System
Atomic Layer Epitaxy System
Facility for Nanopowders Processing and Enhanced Pressure Assisted Sintering
Center for Bio/Molecular Science and Engineering
Code 6900

**Director:** Ms. A.W. Kusterbeck*

**Point of Contact:** Ms. E.C. Newman
Code 6902
(202) 404-6012

*Additional duty

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**Key Personnel**

- Ms. A.W. Kusterbeck* Head, Center for Bio/Molecular Science and Engineering 6900
- Ms. A.W. Kusterbeck Assistant Director 6901
- Ms. E.C. Newman Administrative Officer 6902
- Dr. D.A. Stenger Senior Scientist for Biosurveillance 6905
- Dr. I.L. Medintz Senior Scientist for Biosensors and Biomaterials 6907
- LT N.D. Reynolds Military Deputy 6900
- Dr. J.R. Deschamps Head, Laboratory for Biosensor and Biomaterials 6910
- Ms. A.W. Kusterbeck* Head, Laboratory for Biomolecular Dynamics 6920
- Dr. L.M. Tender Head, Laboratory for the Study of Molecular Interfacial Interactions 6930

**Personnel:** 57 full-time civilian

*Additional duty

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**Research Activity Areas**

- Biologically Derived Microstructures
- Biosensors
- Novel Materials
- Molecular Biology
- Energy Harvesting
Basic Responsibilities

The Center for Bio/Molecular Science and Engineering is using the tools of modern biology, physics, chemistry, and engineering to develop advanced materials and sensors. The long-term research goal is first to gain a fundamental understanding of the relationship between molecular architecture and the function of materials, then apply this knowledge to solve problems for the Navy and DoD community. The key theme is the study of complex bio/molecular systems with the aim of understanding how “nature” has approached the solution of difficult structural and sensing problems. Technological areas currently being studied include molecular and microstructure design, molecular biology, imaging of cells using nanoparticles, sensor design and prototype development for biosurveillance or underwater chemical detection, and energy harvesting. Much of the research deals with the engineering of peptides, proteins, and nanoparticles into complex microstructures for use in advanced material applications, and the harnessing of the recognition functions of proteins and cells for the development of advanced sensors. A highly multidisciplinary staff is required to pursue these research and development programs. The Center provides a stimulating environment for cross-disciplinary programs in the areas of immunology, biochemistry, systems biology, electrochemistry, synthetic chemistry, microbiology, microlithography, photochemistry, biophysics, spectroscopy, advanced diagnostics, organic synthesis, and electro-optical engineering.

Major Research Capabilities and Facilities

Optical equipment
- Confocal microscope
- Raman microscope
- UV-visible absorption spectrophotometers
- Transmission electron microscope
- Scanning electron microscope
- Microscope/atomic force microscope
- Nanosight (nanoparticle tracking analysis)
Analytical instruments
- Gas chromatography mass spectrometer
- HPLC
- LC/MS/MS system
- FluroMax-3 spectrofluorometer
- Titration workstation
General facilities
- X-ray scattering
- Cold room for storage and preparation
- High-speed and microanalytical ultracentrifuges
- Inert atmosphere dry box
- NMR
- FTIR
- Ellipsometer
- Dynamic mechanical analyzer
- Differential scanning calorimeter
- Circular dichroism
- Minimill injection mold machine

Multi RF centrifuge
Perkin Elmer BioChip Arrayer I
Freeze-dry system
Affymetrix Gene Chip system
Surface plasmon resonance (SPR)
Isothermal calorimeter
High-resolution 3D Printer
OCEAN AND ATMOSPHERIC SCIENCE AND TECHNOLOGY DIRECTORATE
Ocean and Atmospheric Science and Technology Directorate

Code 7000

The Ocean and Atmospheric Science and Technology Directorate performs research and development in the fields of acoustics, remote sensing, oceanography, marine geosciences, marine meteorology, and space science. Areas of emphasis in acoustics include advanced acoustic concepts and computation, acoustic signal processing, physical acoustics, acoustic systems, ocean acoustics, and acoustic simulation and tactics. Areas of emphasis in remote sensing include radio, infrared, and optical sensors, remote sensing physics and hydrodynamics, remote sensing simulation, and imaging systems. Areas of emphasis in oceanography include coastal and open ocean dynamics, ocean modeling and prediction, coastal and open ocean processes, remote sensing applications to oceanography, and marine biocorrosion processes. Areas of emphasis in marine geosciences include characterization and prediction of seafloor and terrestrial regions, dynamic littoral and riverine processes, and geospatial sciences and technology. Areas of emphasis in marine meteorology include atmospheric dynamics and coupled processes ranging from theater to tactical scales, coupled data assimilation and prediction systems, and meteorological application systems. Areas of emphasis in space science include middle and upper atmosphere physics, solar terrestrial relationships, solar physics, and higher energy astronomy. Senior naval officers are assigned as military advisors to help maintain the directorate focus on operational Navy and other DoD requirements in these areas of emphasis. The directorate is responsible for administrative and technical support to major activities in Washington, DC; Stennis Space Center, Mississippi; and Monterey, California.
D r. D.G. Todoroff is the Associate Director of Research for Ocean and Atmospheric Science and Technology and the Superintendent of the Acoustics Division at the Naval Research Laboratory. In this capacity, he leads and directs a world-class research organization that conducts basic and applied research in ocean acoustics, physical acoustics, signal processing, and acoustic systems. Dr. Todoroff was appointed to the Senior Executive Service in April 2009, and has over 20 years of Federal service.

Prior to joining the Naval Research Laboratory, Dr. Todoroff held a three-year appointment to NATO (on leave from the Office of Naval Research) as the Deputy Director and Chief Scientist at the NATO Undersea Research Centre, La Spezia, Italy. As Deputy Director, he was responsible for the overall operation of the laboratory, including the management and operation of the Centre’s two research vessels (NRV Alliance and CRV Leonardo). As the Chief Scientist, Dr. Todoroff led the scientific and technical staff, and was responsible for the development and execution of the Centre’s Scientific Program of Work.

Dr. Todoroff joined the Office of Naval Research in 1994. He managed the Navy’s mine warfare S&T programs, led the development of the Organic Mine Countermeasures Future Naval Capability, and led the development of the ONR basic research program to counter Improvised Explosive Devices. While at ONR, Dr. Todoroff was active in international efforts, serving as the U.S. Head of Delegation to NATO Naval Group 3, the U.S. National Lead for Panel 13 of The Technical Cooperation Program, and the U.S. Alternative Representative on the Scientific Committee of National Representatives for the NATO Undersea Research Centre.

From May 1988 through November 1994, Dr. Todoroff served as Division Head, Branch Head, and researcher at the Naval Coastal Systems Station, Panama City, Florida. He also conducted research on acoustic scattering, and was the Chief Scientist for Wake Physics on the Joint U.S./U.K. Surface Ship Torpedo Defense Program.

Dr. Todoroff received a bachelor’s degree in physics as well as a master of arts and a doctorate degree (1983) in physics from Kent State University. He is a member of the Liquid Crystal Institute. Dr. Todoroff’s awards include the Navy Superior Civilian Service Award, the Navy Meritorious Civilian Service Award, and the Commanding Officer/Technical Director Award for Science and Technology.
Key Personnel

Dr. D.G. Todoroff  
Associate Director of Research for Ocean and Atmospheric Science and Technology  
7000

Ms. P.A. Dixon  
Special Assistant  
7001

CDR R.G. Ingersoll, USN  
Military Deputy  
7005

Dr. R.H. Preller*  
Head, Office of Research Support Services  
7030

Dr. B.H. Houston*  
Superintendent, Acoustics Division  
7100

Dr. R.M. Bevilacqua  
Superintendent, Remote Sensing Division  
7200

Dr. R.H. Preller  
Superintendent, Oceanography Division  
7300

Dr. K.T. Holland/Dr. J. Sample*  
Superintendent, Marine Geosciences Division  
7400

Dr. J.A. Hansen  
Superintendent, Marine Meteorology Division  
7500

Dr. C.R. Englert/Dr. J.E. Grove/Dr. D.G. Socker*  
Superintendent, Space Science Division  
7600

Point of Contact: Ms. C.A. Joyce, Code 7000A, (202) 404-8174

*Additional duty
Office of Research Support Services (NRL-SSC)
Code 7030

Head: Dr. R.H. Preller*

Point of Contact: Dr. R.H. Preller
Code 7030
(228) 688-4704; DSN 828-4704

Key Personnel

Dr. R.H. Preller* Head, Office of Research Support Services 7030
Ms. E.H. Rawls* Administrative Officer 7030.2
Mr. P.T. Haverstic Head, Facilities Office 7030.3
Ms. S.M. Mensi NRL-SSC Strategic Communications Office 7030.4
Mr. W.L. Calehuff Safety/Environmental Officer 7030.5
Ms. H.K. Turfitt HPC Management Office 7030.6
Mr. K.O. Davis NRL-SSC Network Management Office 7030.8

Personnel: 8 full-time civilian
*Acting  *Additional duty

Staff Activity Areas

Facilities
HPC Management
Safety/Environmental
Public Affairs
NRL-SSC Network Management
Basic Responsibilities

The Office of Research Support Services is responsible for the operational and management support necessary for the day-to-day operations at NRL Stennis Space Center, Mississippi (NRL-SSC). The head of NRL-SSC acts for the Commanding Officer in dealing with local Navy, Federal, and civil activities and personnel on matters relating to NRL-SSC support activities and facilities, community and multicommand issues, and safety and disaster control measures. Support functions include public affairs, network support, safety, high performance computer management, and support services to include management, administration, and facilities.
Acoustics Division

Code 7100

Superintendent: Dr. B. Houston

Point of Contact: Mr. J.R. Tomlinson
Code 7102
(202) 767-3176

Key Personnel

Dr. B. Houston* Superintendent, Acoustics Division 7100
Vacant Associate Superintendent 7101
Mr. J.R. Tomlinson Administrative Officer 7102
Vacant Military Deputy 7105
Dr. E.G. Williams Senior Scientist for Structural Acoustics 7106
Dr. B.H. Houston Head, Physical Acoustics Branch 7130
Dr. D.C. Calvo* Head, Acoustic Signal Processing and Systems Branch 7160
Dr. J.P. Fabre Head, Acoustic Simulation, Measurements, and Tactics Branch 7180

Personnel: 65 full-time civilian; 1 military

*Acting  *Additional duty

Research Activity Areas

Physical Acoustics
Acoustic Signal Processing and Systems
Acoustic Simulation, Measurements, and Tactics
Basic Responsibilities

The Acoustics Division conducts basic and applied research addressing the physics of acoustic signal generation, propagation, scatter, and detection with the objective of improving the strategic and tactical capabilities of the Navy and Marine Corps in the ocean and land operational environment. The Division's scientists and engineers perform collaborative research with scientists affiliated with national and international academic, private, and governmental research organizations. The Division's research spans classical and quantum physics, signal processing, the impact of fluid dynamics on the oceans sound speed field, the propagation and scatter of acoustic signals in the ocean and land environments, structural and physical acoustics including the development of MEMS and nanotechnology based sensors, and the application of networked unmanned underwater vehicles and associated sensors to the Navy’s ASW, MCM, and ISR missions.

Major Research Capabilities and Facilities

Laboratory Measurements
- One-million-gallon, vibration-isolated underwater acoustic holographic/3D laser vibrometer facility for studying structural acoustic phenomena
- Large, sandy-bottom, acoustic holographic pool facility for investigating echo characteristics of underwater buried/near-bottom targets and sediment acoustics
- In-air structural acoustics facility with high spatial density near-field acoustic holography and 3D laser vibrometry for diagnosing large structures, including aircraft interiors and rocket payload fairings
- Salt water acoustic tank (20 ft by 20 ft by 10 ft deep) with environmental control and substantial optical access for studying the acoustics of bubbly media, acoustic metamaterials, and laser induced sound
- Micro-Nanostructure Dynamics Laboratory to study the structural dynamics and performance of high Q oscillators and other micromechanical systems using laser Doppler vibrometers, super resolution nearfield scanning optical microscope, and low temperature calorimeter
- Additive Manufacturing Center to fabricate structures and devices using 3D printing techniques

Sonomagnetic Laboratory with doubly insulated Faraday cage for conducting experiments to measure weak electromagnetic fields generated by mechanical/ acoustic vibrations of a conducting medium in an arbitrary magnetic field

Seagoing Assets
- Acoustic arrays (towed/moored/suspended)
- 64-channel broadband source–receiver array with time-reversal mirror functionality over a frequency band of 500 to 3500 Hz
- High-powered sound sources and source arrays
- Autonomous acoustic sources
- Acoustic communications array and data acquisition buoy
- Portable, ocean-deployable synthetic aperture acoustic measurement system (100-meter rail with precise positioning)
- Containerized, seagoing multichannel data acquisition system
- High-speed, maneuverable towed body with MK-50 and synthetic aperture sonars to measure high frequency scattering and coherence
## Remote Sensing Division

Code 7200

**Superintendent:** Dr. R.M. Bevilacqua

**Point of Contact:** Dr. R.M. Bevilacqua
Code 7200
(202) 767-3391

### Key Personnel

<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Branch/Office</th>
<th>Code</th>
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<tbody>
<tr>
<td>Dr. R.M. Bevilacqua</td>
<td>Superintendent, Remote Sensing Division</td>
<td>7200</td>
</tr>
<tr>
<td>Vacant</td>
<td>Associate Superintendent</td>
<td>7201</td>
</tr>
<tr>
<td>Mr. M.S. Deniston</td>
<td>Administrative Officer</td>
<td>7202</td>
</tr>
<tr>
<td>LCDR D.J. Cheney, USN</td>
<td>Military Deputy</td>
<td>7205</td>
</tr>
<tr>
<td>Vacant</td>
<td>Special Projects Office</td>
<td>7207</td>
</tr>
<tr>
<td>Dr. S.R. Restaino</td>
<td>Head, Radio/Infrared/Optical Sensors Branch</td>
<td>7210</td>
</tr>
<tr>
<td>Dr. P.W. Gaiser</td>
<td>Head, Remote Sensing Physics Branch</td>
<td>7220</td>
</tr>
<tr>
<td>Dr. M.E. Kappus</td>
<td>Head, Coastal and Ocean Remote Sensing Branch</td>
<td>7230</td>
</tr>
<tr>
<td>Dr. R.L. Fiedler</td>
<td>Head, Image Science and Applications Branch</td>
<td>7260</td>
</tr>
</tbody>
</table>

**Personnel:** 82 full-time civilian; 1 military

### Research Activity Areas

- Passive Microwave research and exploitation
- Middle Atmosphere
- Hydodynamics
- Hyper/multi-spectral Coastal Imaging
- Synthetic Aperture Radar Exploitation
- Interferometric Imaging
- Ionospheric Remote Sensing
- Astrophysics
Basic Responsibilities

The Remote Sensing Division is the Navy's center of excellence for remote sensing research and development, conducting a program of basic research, science, and applications aimed at the development of new concepts for sensors and imaging systems for objects and targets on the Earth, in the near-Earth environment, and in deep space. The research, both theoretical and experimental, deals with discovering and understanding the basic physical principles and mechanisms that give rise to target and background emission and to absorption and emission by the intervening medium. The accomplishment of this research requires the development of sensor systems technology. This development effort includes active and passive sensor systems to be used for the study and analysis of the physical characteristics of phenomena that give rise to naturally occurring background radiation, such as that caused by the Earth's atmosphere and oceans, as well as man-made or induced phenomena, such as ship/submarine hydrodynamic effects. The research also includes theory, laboratory, and field experiments leading to ground-based, airborne, and space-based systems for use in such areas as environmental remote sensing (including improved meteorological support systems for the operational Navy), astrometry, astrophysics, surveillance, and nonacoustic ASW. Special emphasis is given to developing space-based platforms and exploiting existing space systems.

Major Research Capabilities and Facilities

WindSat satellite instrument (joint with Code 8000)
WindSat processing facility
Ground-based water vapor millimeter-wave spectrometer (WVMS)
SAR processing facility
SCI processing facility
SEALAB
SAP facility
Hyperspectral imaging, sensors, and processing facility
Optical remote sensing calibration lab/facility
Navy Precision Optical Interferometer (NPOI)
Very Large Array (VLA) Low-band Ionospheric and Transient Experiment (VLITE)
Free surface hydrodynamics laboratory (including a 10 m wave tank with wave generation capability)

In-water lidar facility
Aerosol field measurement facility
Airborne polarimetric microwave imaging radiometer (APMIR)
Interferometric Synthetic Aperture Radar (InSAR)
Multi-phase Center Synthetic Aperture Radar (MSAR)
Electro-optical (EO) airborne sensor suite
Visible/near infrared (VNIR) hyperspectral imaging systems
VNIR polarimetric multispectral imager
Short-wave IR (SWIR) hyperspectral imaging systems
Midwave infrared (MWIR) indium antimonide (InSb) imaging system
Long-wave infrared (LWIR) quantum well IR photodetector (QWIP) imaging system
Oceanography Division
Code 7300

Superintendent: Dr. R.H. Preller

Point of Contact: Mr. R.C. Rhodes
Code 7301
(228) 688-4704; DSN 828-4704

Key Personnel

Dr. R.H. Preller  Superintendent, Oceanography Division  7300
Mr. R.C. Rhodes  Associate Superintendent  7301
Ms. E.H. Rawls  Administrative Officer  7302
Dr. B.J. Little  Office of the Senior Scientist for Marine Molecular Processes  7303
Vacant  Military Deputy  7305
Mr. W.R. Maloy, Jr.  Head, Information Technology Office  7309
Dr. G.A. Jacobs  Head, Ocean Dynamics and Prediction Branch  7320
Dr. R.L. Crout  Head, Ocean Sciences Branch  7330

Personnel: 75 full-time civilian; 1 military

Research Activity Areas

Ocean Dynamics and Prediction
Ocean Data Assimilation
Coupled Environmental Models
Physical Oceanographic Processes
Bio-optical Modeling
Remote Sensing of Ocean Optics
Ocean Lidar Applications
Basic Responsibilities

The Oceanography Division conducts basic and applied research in description and modeling of biological, physical, and dynamical processes in open ocean, regional, and littoral areas; in exploitation of satellite, airborne, and in situ sensors for environmental characterization; and in investigation and application of microbial processes to Navy problems. The oceanographic research is both theoretical and experimental in nature and is focused on understanding and modeling ocean, coastal, and littoral area hydro/thermodynamics, circulation, waves, ice dynamics, air–sea exchange, optics, and small and microscale processes. Analytical methods and algorithms are developed to provide quantitative retrieval of geophysical parameters of Navy interest from state-of-the-art sensor systems. The Division work includes analysis of biological processes that mediate and control optical properties of the oceans, coastal, and littoral regions, and microbiologically induced corrosion/metal–microbe interaction. The Division programs are designed to be responsive to and to anticipate Naval needs. Transition of Division products to the DoD, Navy systems developers, operational Navy, and civilian (dual use) programs is a primary goal. The Division’s programs are coordinated and interactive with other NRL programs and activities, ONR’s research programs, and other government agencies involved in oceanographic activities. The Division also collaborates and cooperates with scientists from the academic community and other U.S. and foreign laboratories.

Major Research Capabilities and Facilities

Towed sensor and advanced microstructure profiler systems for studying upper ocean fine and micro-structure
Integrated absorption cavity and optical profiler systems for studying ocean optical characteristics
Self-contained bottom-mounted upward-looking acoustic profilers for measuring ocean variability
Acoustic Doppler profiler for determining ocean currents while under way
Remotely operated underwater vehicle (ROV)
Bottom-mounted acoustic Doppler profilers
Towed hyperspectral optical array
SCI processing facility
Satellite receiving stations for AVHRR, MODIS, DMSP, and JPASS ocean color processing facility
Environmental scanning electron microscope, confocal laser scanning microscope, and Inspect slow vacuum scanning electron microscope for detailed studies of biocorrosion in naval materials
Real-time Ocean Observations and Forecast Facility for monitoring and tracking of ocean physical and bio-optical conditions
Slocum Electric Gliders for performing wide-area ocean surveys of temperature, salinity, and optical characteristics
SCANFISH MKII, a towed undulating vehicle system, designed for collecting 3D TS profile data of the water column
Bottom-mounted Shallow water Environmental Profiler in Trawl-safe Real-time configuration (SEPTR) for measuring temperature, salinity, and optical parameters in addition to current profiles and pressure
Bio-optical Physical Pop-up Environmental Reconnaissance System to measure bio-optical and physical properties of the water column
Cytosense Scanning Flow Cytometer to identify individual phytoplankton and zooplankton for ecological model development and validation
Shipboard Lidar Optical Profiler and Turbulence Ocean Lidar (TURBOL) to measure optical properties of the water
Simulated Turbulence and Turbidity Environment (SITTE) using a Raleigh Bernard Convective Tank with Hybrid Underwater Camera and TURBOL to study both particulates as well as turbulent mixing in underwater environments
Collaborative system for propagating environment error distributions through disparate dynamical systems
Marine Geosciences Division

Code 7400

Superintendent: Dr. K.T. Holland/Dr. J. Sample

Point of Contact: Ms. S.M. Bower
Code 7400
(228) 688-4650; DSN 828-4650

Key Personnel

Dr. K.T. Holland/Dr. J. Sample† Superintendent, Marine Geosciences Division 7400
Vacant Associate Superintendent 7401
Vacant Administrative Officer 7402
Dr. K.B. Shaw Head, Office of Geospatial Science and Tech. Innovation 7403
CDR S. Miller, USN Military Deputy 7405
Dr. K.T. Holland Head, Seafloor Sciences Branch 7430
Dr. J. Sample Head, Geospatial Sciences and Technology Branch 7440

Personnel: 85 full-time civilian; 2 military
†Additional duty

Research Activity Areas

Marine Geology
Marine Geophysics
Geospatial Sciences and Technology
Marine Related In Situ and Laboratory Sensors

Basic Responsibilities

The Marine Geosciences Division conducts a broadly based, multidisciplinary program of scientific research, advanced technology development, and applied research in marine geosciences, geodesy, geospatial information, and related technologies. This includes investigations of basic processes within ocean basins, littoral regions and adjacent land areas, and arctic regions; development of models, sensors, and techniques; and the exploitation of this knowledge and technology to enhance Navy and Marine Corps systems, plans, and operations, and to meet national needs.
As the Navy’s subject matter expert in the areas of geospatial computing, analysis, and data, the Division provides vital technical support to the Oceanographer/Navigator of the Navy; Commander, Naval Meteorology and Oceanography (CNMOC); CNO (N2/N6E); the National Geospatial–Intelligence Agency (NGA); and the Tri-Service Community. NRL also contributes to the development of leading-edge geospatial technology by reviewing emerging standards and products.

Close coordination and interactions with the Commander, Naval Meteorology and Oceanography Command, Naval Oceanographic Office, CNO, Office of Naval Research (ONR), Systems Commands, Warfare Centers, NGA, and the other DoD and national organizations are essential to the success of Division programs, with transition of Division technology to systems developers and to the operational Navy as a primary goal. The Division program is coordinated and interactive with other NRL programs and activities, ONR’s research programs, NOAA, USGS, NSF; and other government agencies involved in seafloor activities. The Division collaborates and cooperates with scientists from the academic community, other U.S. and foreign laboratories, and industry.

**Major Research Capabilities and Facilities**

- Airborne gravimetry, magnetics, and topographic measurements suite coupled with differential GPS yielding position accuracies of <1.0 meter
- 100 and 500 kHz sidescan sonar with 2–12 kHz chirp profiler and Cs magnetometer for seafloor characterization/imaging and shallow subbottom profiling
- Deep-towed acoustic geophysical system operating at 220–1000 Hz characterizes subseafloor structure
- Acoustic seafloor classification system operating at 8–50 kHz provides underway, real-time prediction of sediment type and physical properties
- Seafloor probes for measuring sediment pore water pressures, permeability, electrical resistivity, acoustic compressional and shear wave velocities and attenuations, and dynamic penetration resistance
- Electronic Charting and Navigation System Test and Validation Facility
- Comprehensive geotechnical and geoacoustics laboratory capability
- 3D, multispectral, subbottom swath imaging system
- Ocean bottom seismographs (OBS)
- In situ sediment acoustic measurement system (ISSAMS)
- Instrumented mine shapes to measure hydrodynamics of free-fall in the water column, dynamics of deceleration in seafloor sediments, and rates and depths of scour burial
- Bottom Mounted Sector Scanning and Pencil Beam Sonar System

- Integrated digital databases analysis and display system for bathymetric, meteorological, oceanographic, geoacoustic, and acoustic data
- Sediment gas-content sampler
- Acoustic tomographic probes for surf zone sands and gassy muds
- Computed tomography (CT) system and real-time radiography unit with a 0–225 keV @ 0–1 mA micro-focus X-ray tube and a 225 mm image intensifier
- Human Machine Interaction Laboratory
- GPS-based survey vehicles and equipment to measure foreshore and nearshore bathymetry (camera towers, jet ski, and push cart)
- Geospatial lab for rapid 2D and 3D visualization, analysis, and prototyping
- Small oscillatory flow tunnel to observe sediment dynamics under forcing from waves and currents
- Tomographic particle image velocimetry system for three-dimensional volumetric velocity measurements of fluid flow
- SEABAT Bathymetric Survey System, 200–400 kHz
- 3D Riverine Mapping System
- Multi-band Synthetic Aperture Radar; 2.5–9.5 MHz, 1000–1500 MHz
- UXS Environmental Sensing Laboratory
- Marine Biogeochemistry Laboratory
Marine Meteorology Division

Code 7500

Superintendent: Dr. J.A. Hansen

Point of Contact: Ms. L.A. Hazard
Code 7502
(831) 656-4314; DSN 828-4314

Key Personnel

Dr. J.A. Hansen Superintendent, Marine Meteorology Division 7500
Dr. D.L. Westphal Associate Superintendent 7501
Ms. L.A. Hazard Administrative Officer 7502
Dr. J.D. Doyle Senior Scientist for Mesoscale Meteorology 7503
Dr. C.A. Reynolds Lead Scientist, Probabilistic Prediction Research Office 7504
LCDR D.H. Watson, USN Military Deputy 7505
Dr. L. Xu Head, Atmospheric Dynamics and Prediction Branch 7530
Dr. T.R. Holt Head, Meteorological Applications Development Branch 7540

Personnel: 77 full-time civilian; 1 military

Research Activity Areas

Atmospheric Dynamics and Prediction
Data Assimilation
Tactical Environmental Support
Atmospheric Physics
Satellite Data/Imagery
Decision Aids
Basic Responsibilities

The Marine Meteorology Division conducts a basic and applied research and development program designed to improve scientific understanding of atmospheric processes that impact Fleet operations and to develop automated systems that analyze, simulate, predict, and interpret the structure and behavior of these processes and their effect on naval weapons systems. Basic and applied research includes work in air–sea interaction, aerosol and cloud physics, atmospheric turbulence, orographically forced flow, atmospheric predictability, scale interactions observation impact, advanced data assimilation, ensemble prediction, tropical dynamics, and numerical methods. Research and development ranges from development of atmospheric analysis/forecast systems and satellite data products to the development of tactical decision aids for operations support. Interdisciplinary research supports the development of coupled analysis/forecast systems, including components for ocean, wave, land surface, aerosol, chemistry, and middle atmosphere prediction. NRL-Monterey (NRL-MRY) is co-located with the Fleet Numerical Meteorology and Oceanography Center (FNMOC), the Navy’s operational forecast center. NRL-MRY has developed and transitioned to FNMOC and other operational centers the data assimilation, global, and mesoscale weather forecast models, aerosol prediction systems, and satellite applications products that form the backbone of the Navy’s worldwide environmental forecasting capability. Specialties of the Division include numerical weather prediction, data assimilation, tropical cyclones, marine boundary layer processes, aerosols, rapid environmental assessment, environmental decision aids, and satellite data analysis, interpretation, and application.

Major Research Capabilities and Facilities

The U.S. GODAE Data Server (Global Ocean Data Assimilation Experiment) for collection and broad distribution of near-real-time METOC data and higher-level products from Navy, DoD, and other providers to the global ocean and atmospheric research community

A Cray XE6m Supercomputer for numerical weather prediction systems development provided by the DoD High Speed Computing Modernization Program (HPCMP) through a Dedicated HPC Project Investment (DHPI) grant

A large data center with an extensive disk file storage capacity and research data tape backup/archival capability

Classified and unclassified radar and satellite data processing facility

Two Mobile Atmospheric Aerosol and Radiation Characterization Observatories (MAARCO) used to collect atmospheric data around the world

Rooftop observation platform, laboratory and calibration facilities, and surface and airborne instrumentation for research on the effects of atmospheric aerosols, clouds and radiation on visibility, naval sensors and Earth’s weather and climate

The mobile NRL Cloud Lab equipped with a portable Ka-band scanning Doppler radar, microwave radiometer, ceilometer, fog drop detector and two laser disdrometers for studying cloud evolution

Marine Meteorology Center building for the Meteorological Applications Development Branch, Secure IT Facility, Division Administrative support, and Front Office Management Team
Space Science Division
Code 7600

Superintendent: Dr. C.R. Englert

Point of Contact: Ms. S.L. Swann
Code 7602
(202) 767-3248

Key Personnel

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Code</th>
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<tbody>
<tr>
<td>Dr. C.R. Englert</td>
<td>Superintendent, Space Science Division</td>
<td>7600</td>
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<tr>
<td>Vacant</td>
<td>Associate Superintendent</td>
<td>7601</td>
</tr>
<tr>
<td>Ms. S.L. Swann</td>
<td>Administrative Officer</td>
<td>7602</td>
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<tr>
<td>Vacant</td>
<td>Military Deputy</td>
<td>7603</td>
</tr>
<tr>
<td>Dr. J.L. Lean</td>
<td>Senior Scientist for Sun-Earth Systems Research</td>
<td>7605</td>
</tr>
<tr>
<td>Dr. C.R. Englert</td>
<td>Head, Geospace Science and Technology Branch</td>
<td>7630</td>
</tr>
<tr>
<td>Dr. J.E. Grove</td>
<td>Head, High-Energy Space Environment Branch</td>
<td>7650</td>
</tr>
<tr>
<td>Dr. D.G. Socker</td>
<td>Head, Solar and Heliospheric Physics Branch</td>
<td>7680</td>
</tr>
</tbody>
</table>

Personnel: 77 full-time civilian; 1 military

Research Activity Areas

- Geospace Science and Technology
- High Energy Space Environment
- Solar and Heliospheric Physics
Basic Responsibilities

The Space Science Division conducts a broad-spectrum RDT&E program in solar-terrestrial physics, astrophysics, upper/middle atmospheric science, and astronomy. Instruments to be flown on satellites, sounding rockets and balloons, and ground-based facilities and mathematical models are conceived and developed. Researchers apply these and other capabilities to the study of the atmospheres of the Sun and Earth, including solar activity and its effects on the Earth’s ionosphere, upper atmosphere, and middle atmosphere; laboratory astrophysics; and the unique physics and properties of celestial sources. The science is important to orbital tracking, radio communications, and navigation that affect the operation of ships and aircraft, utilization of the near-space and space environment of the Earth, and the fundamental understanding of natural radiation and geophysical phenomena.

Major Research Capabilities and Facilities

Development and test facilities for satellite, sounding rocket, and balloon instruments, to perform solar terrestrial, astrophysical, astronomical, solar, upper/middle atmospheric, and space environment sensing
Solar Coronagraph Optical Test Chamber (SCOTCH)
Vacuum Ultraviolet Calibration Facility (VUCF)
Gamma Ray Imaging Laboratory (GRIL)
Rocket Assembly and Checkout Facility
Neutron Characterization Laboratory
Semiautomatic Probe Station
Solar Irradiance Calibration Facility
Suborbital Instrument Assembly and Test Facility
SuperMISTI series of reconfigurable and adaptable stand-off gamma ray and neutron radiation detection systems for detection of special nuclear material and other radiological/nuclear Weapons of Mass Destruction
Fast Neutron Spectrometer (FNS) deployable stand-off neutron radiation detection system
Strontium Iodide Radiation Instrumentation (SIRI) satellite instrument series
Very high angular Resolution Imaging Spectrometer (VERIS) sounding rocket instrument
Helium Resonance Scattering in the Corona and Heliospheric (HERSCHEL) sounding rocket instrument
High Intensity Transient Event Acquisition System (HITEAS)
Michelson Interferometer for Global High-resolution Thermospheric Imaging (MIGHTI) satellite instrument

Extreme Ultraviolet Imaging Spectrometer (EIS) satellite instrument
Large Angle Spectrometric Coronagraph (LASCO) satellite instrument
Sun Earth Connection Coronal and Heliospheric Investigation (SECCHI) satellite instrument suite
Solar Orbiter Heliospheric Imager (SoloHI) satellite instrument
Wide-field Imager for Solar PRobe (WISPR) satellite instrument
Compact Coronograph (CCOR) satellite instrument
Special Sensor Ultraviolet Limb Imager (SSULI) satellite instrument
Winds Ions Neutrals Composition Suite (WINCS) small satellite instrument suite
Extensive computer-assisted data manipulation, interpretive, and theoretical capabilities for space science instrumentation operations, data imaging, and modeling
SECCHI Payload Operations Center (POC)
Fermi Gamma-ray Space Telescope (formerly GLAST) Science Analysis Center (SAC)
SoftWare for Optimization of Radiation Detectors (SWORD)
Mountain Wave Forecast Model (MWFM)
Mass Spectrometer and Incoherent Scatter Radar empirical atmospheric model (NRLMSISE)
Horizontal Wind Model (HWM)
Ground to Space empirical atmospheric model (G2S)
Navy Gloval Environmental Model (NAVGEM)
Highly Integrated Thermosphere Ionosphere DEmonstration System (HI-TIDES)
In its role to preserve and enhance a strong space technology base and provide expert assistance in the development and acquisition of space systems that support naval missions, the Naval Center for Space Technology performs basic and applied research through advanced development in all areas of interest to the Navy space program. The Center develops spacecraft, systems using these spacecraft, and ground command and control stations. Principal functions of the Center include understanding and clarifying requirements, recognizing and prosecuting promising research and development, analyzing and testing systems to quantify their capabilities, developing operational concepts that exploit new technical capabilities, performing system engineering to allocate design requirements to subsystems, and performing engineering development and initial operation to test and evaluate selected spacecraft subsystems and systems. The Center is a focal point and integrator for those divisions at NRL whose technologies are used in space systems. The Center also provides systems engineering and technical direction assistance to system acquisition managers of major space systems. In this role, technology transfer is a major goal and motivates a continuous search for new technologies and capabilities and the development of prototypes that demonstrate the integration of such technologies.
Mr. Christopher Dwyer is currently Acting Superintendent of the Naval Research Laboratory’s (NRL) Space Systems Development Department (SSDD). The department is the space and ground systems development organization of the Naval Center for Space Technology. As Superintendent, Mr. Dwyer leads a highly skilled team of scientists, engineers, and technicians and is responsible for the executive level leadership of a broad spectrum of highly sophisticated research and development programs in the areas of advanced mission and concept development and overall system engineering for Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance systems for the space, near-space, and other environments. In this position, he is responsible for directing the financial, personnel, programmatic, and facilities of the SSDD, including obtaining the funding for the execution of SSDD’s Research and Development efforts. Mr. Dwyer entered the Senior Executive Service in March of 2009. He has been at NRL since he became a member of the Civilian Service in July 1985. Mr. Dwyer served as the Head of SSDD’s Command, Control, Communications, Computers, and Intelligence Branch from March 2004 to March 2009. As the Branch head, Mr. Dwyer lead research and development efforts communications systems, data collection processing systems, information dissemination systems, mobile command and control systems, and spacecraft tracking, telemetry, and control systems. He was named Acting Superintendent of the Space Systems Development Department in October 2008. Mr. Dwyer earned B.S. degree in electrical engineering from the University of Virginia in 1985. From 2006 until 2009, Mr. Dwyer led the technical execution of two Maritime Domain Awareness (MDA) Joint Capability Technology Demonstrations (JCTDs), Comprehensive Maritime Awareness (CMA), and Maritime Automated Supertrack Enhanced Reporting (MASTER). CMA and MASTER were awarded the 2008 JCTD Team of the Year award. For his MDA research and development leadership, Mr. Dwyer was named a finalist for the Partnership for Public Service’s 2009 National Security and International Affairs Medal.

Dr. Sandhoo is currently Acting Superintendent of the Spacecraft Engineering Department of the Naval Center of Space Technology (NCST). Dr. Sandhoo holds a B.S. degree in mechanical engineering from the University of Maryland, a master’s degree in electrical engineering from Johns Hopkins University, a master’s degree from the U.S. Naval War College, and a master’s and Ph.D. degree in aeronautics and astronautics from George Washington University. After working at NASA’s Johnson Space Center, Johns Hopkins University’s Applied Physics Laboratory, and in industry, Dr. Sandhoo began his career at NRL in 2005 as a senior aerospace engineer. Prior to his role as Superintendent, Dr. Sandhoo has served as the science advisor for the U.S. Navy’s Fifth Fleet in Bahrain, and as a member of Naval Warfare Integration group on the staff of Chief of Naval Operations.
Key Personnel

Mr. C. Dwyer/Dr. G.S. Sandhoo*  
Vacant  
Vacant  
Ms. K. Cavalier  
CDR J.D. Tuthill  
Mr. C. Dwyer  
Dr. G.S. Sandhoo  

*Additional duty

Point of Contact: Ms. K. Cavalier, Code 8010, (202) 767-6552
Space Systems Development Department
Code 8100

Superintendent: Mr. C. Dwyer

Point of Contact: Ms. M.E. Russo
Code 8102
(202) 767-0432

Key Personnel

Mr. C. Dwyer                 Superintendent, Space Systems Development Department 8100
Mr. D.A. DeRieux            Associate Superintendent 8101
Ms. M.E. Russo              Administrative Officer 8102
Mr. R.L. Nichols            Head, Mission Management Office 8103
Vacant                      Head, National Programs Support Office 8104
Mr. A.S. Hope               Head, Mission Development Branch 8110
Dr. K.A. Clark              Head, Advanced Systems Technology Branch 8120
Ms. W.S. Borodin            Head, Command, Control, Communications, Computers, and Intelligence Branch 8140
Dr. K.L. Senior             Head, Advanced Space Precision Navigation and Timing Branch 8150

Personnel: 147 full-time civilian; 1 part-time civilian; 11 student civilian; 1 military

Research Activity Areas

Advanced Space/Airborne/Ground Systems Technologies
Astrodynamics
Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
Space and Airborne Payload Development
Laser Communications Research
Space and Airborne Mission Development
Precision Navigation and Time
Basic Responsibilities

The Space Systems Development Department (SSDD) is the space and ground support systems research and development organization of the Naval Center for Space Technology. The primary objective of the SSDD is to develop command, control, communications, computers, and intelligence, surveillance, and reconnaissance (C4ISR) hardware and software solutions to space, airborne, and ground applications to respond to Navy, DoD, and national mission requirements with improved performance, capacity, reliability, efficiency, and/or life cycle cost. The Department must derive system requirements from the mission, develop architectures in response to these requirements, and design and develop systems, subsystems, equipment, and implementation technologies to achieve the optimized, integrated operational space, airborne, and ground system. These development responsibilities extend across the entire space/airborne/ground spectrum of hardware, software, and advanced technologies, including digital processing and control, analog systems, power, communications, payload command and telemetry, radio frequency, optical, payload, and electromechanical systems, as well as systems engineering.

Major Research Capabilities and Facilities

Payload test facility and processor development laboratory
Laser communications and electro-optics laboratories
Tactical Technology Development Laboratory (TTDL)
Precision oscillator (clock) test facility
RF payload development laboratory with anechoic chamber
Precision high-frequency RF compact range anechoic chamber facility
Transportable ground station development, assembly, and test facility
Multiplatform FPGA/ASIC/VLSI development laboratory
Pomoneky field site: large antenna, space communications, and research facility
Midway Research Center space communications and research facility
Optical telescope facility
Spacecraft Engineering Department
Code 8200

Key Personnel

Dr. G.S. Sandhoo  Superintendent, Spacecraft Engineering Department  8200
Mr. M.S. Johnson  Associate Superintendent  8201
Ms. C.A. Gross  Administrative Officer  8202
Mr. G.A. Golba*  Head, Programs Support Office  8204
Mr. J.D. Brooks  Head, Blossom Point Satellite Command and Tracking Facility  8206
Mr. T. Duffey  Head, Design, Test, and Processing Branch  8210
Vacant  Head, Space Mechanical Systems Development Branch  8220
Mr. M.E. Mook  Head, Control Systems Branch  8230
Mr. M.S. Johnson  Head, Space Electronics Systems Development Branch  8240

Personnel: 154 full-time civilian; 2 part-time civilian; 21 student civilian

*Acting

Research Activity Areas

Design, Test, and Processing
Space Mechanical Systems Development
Control Systems
Space Electronic Systems Development
Spacecraft and Robotics Control Systems
  Attitude Control Systems
  Propulsion Systems
Astrodynamics, Orbit Determination, and Control
Robotic Control, Agility, and Motor Learning

Superintendent: Dr. G.S. Sandhoo

Point of Contact: Ms. C.A. Gross
Code 8202
(202) 767-6412
Basic Responsibilities

The Spacecraft Engineering Department (SED) is the focal point for the Navy’s capability to design and build spacecraft. Activities range from concept and feasibility planning to on-orbit IOC for NRL’s space systems.

The SED provides spacecraft bus expertise for the Navy and maintains an active in-house capability to develop satellites; manages Navy space programs through engineering support and technical direction; in concert with the Space Systems Development Department, designs, assembles, and tests spacecraft and space experiments, including all aspects of space, launch, and ground support; analyzes and designs structures, mechanisms, and a variety of control systems, including attitude, propulsion, reaction, and thermal; integrates satellite designs, launch vehicles, and satellite-to-boost stages; functions as a prototype laboratory to ensure that designs can be transferred to industry and incorporated into subsequent satellite hardware builds; and consults with the Navy Program Office on technical issues involving spacecraft architecture, acquisition, and operation.

Major Research Capabilities and Facilities

Chambers:
- Thermal-vacuum
- Acoustic reverberation
- Large, tapered horn, RF anechoic chamber
- EMI/EMC testing chamber

Facilities:
- Spacecraft high-reliability electronic and electrical rework facility
- Spacecraft electronic systems integration and test facility
- Radio frequency (RF) system development facility
- RF microcircuit fabrication clean room facility
- Large tapered horn RF anechoic chamber facility
- Frequency sources laboratory
- Shock and vibration test
- Clean rooms (multiple classes and sizes)
- Spacecraft fabrication and assembly
- Fuels testing
- Autoclave
- Space robotics laboratory
- Proximity operations testbed
- CAD/CAM
- Propulsion system welding
- Static loads test
- Star tracker characterization
- Spacecraft spin balance
- Modal analysis
- Computational astrodynmic simulation and visualization
- Advanced Two-Phase Heat Transfer
- Satellite telemetry, tracking, and satellite control at Blossom Point, MD
- L/C/S/X-band fixed antenna resources
- Connectivity to the Air Force Satellite Control Network (AFSCN)
TECHNICAL OUTPUT, FISCAL, AND PERSONNEL INFORMATION
The Navy continues to be a pioneer in science and engineering developments and a leader in applying these advancements to military requirements. The primary means of informing the scientific and engineering community of the advances made at NRL is through the Laboratory’s technical output—reports, articles in scientific journals, contributions to books, papers presented to scientific societies and topical conferences, patents, and inventions.

The figures for calendar years 2017 and 2018 presented below represent the output of NRL facilities in Washington, DC; Bay St. Louis, Mississippi; and Monterey, California.

In 1986, Congress enacted the Federal Technology Transfer Act in an effort to encourage the commercial use of technology developed in Federal laboratories. The Act allows Government inventors and the laboratories where they work to share the royalties generated by commercial licensing of their inventions. Also, the Act encourages the establishment of Cooperative Research and Development Agreements (CRADAs) between laboratories such as NRL and non-Federal entities such as state and local governments, universities, and business corporations. Such cooperative R&D agreements can include the allocation in advance of patent rights on any inventions made under the joint research effort.

The 1986 Act has given additional impetus to the Laboratory’s efforts to patent important inventions arising out of its various research programs.

### Calendar Year 2017

<table>
<thead>
<tr>
<th>Type of Contribution</th>
<th>Unclassified</th>
<th>Classified</th>
<th>Total</th>
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<tr>
<td>Articles in periodicals, chapters in books, and papers in published proceedings</td>
<td>1340</td>
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<tr>
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<tr>
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<td>Foreign patents granted</td>
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### Calendar Year 2018

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*This is a provisional total based on information available to the Ruth H. Hooker Research Library on March 5, 2019. Total includes refereed and non-refereed publications.
### FY 2017 Sources of New Funds (Actual)

#### FY 2017 Source of Funds

<table>
<thead>
<tr>
<th>Source of Funds</th>
<th>Reimbursable</th>
<th>Direct Cite</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Office of Naval Research (ONR)</td>
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<td>448.9</td>
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<td>Naval Sea Systems Command (NAVSEA)</td>
<td>44.3</td>
<td>63.0</td>
<td>107.3</td>
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<tr>
<td>Space and Naval Warfare Systems Command (SPAWAR)</td>
<td>8.4</td>
<td>0.6</td>
<td>9.0</td>
</tr>
<tr>
<td>Naval Air Systems Command (NAVAIR)</td>
<td>28.4</td>
<td>21.7</td>
<td>50.1</td>
</tr>
<tr>
<td>Other Navy</td>
<td>85.4</td>
<td>12.1</td>
<td>97.5</td>
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<tr>
<td>All Other</td>
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<td>50.7</td>
<td>409.3</td>
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<tr>
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<td><strong>185.0</strong></td>
<td><strong>1,122.1</strong></td>
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#### FY 2018 Source of Funds

<table>
<thead>
<tr>
<th>Source of Funds</th>
<th>Reimbursable</th>
<th>Direct Cite</th>
<th>Total</th>
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</thead>
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<td>444.8</td>
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<td>Other Navy</td>
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<td><strong>1,110.8</strong></td>
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FY 2017/2018 Uses of Funds

**FY 2017**

**Distribution of Funds**

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount (M)</th>
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<tbody>
<tr>
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<tr>
<td>General Overhead</td>
<td>97.8</td>
</tr>
<tr>
<td>Indirect Overhead</td>
<td>103.9</td>
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<tr>
<td>Direct Material, Travel, and Other</td>
<td>145.6</td>
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<tr>
<td>Direct Contracts</td>
<td>428.1</td>
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<tr>
<td><strong>Total Costs</strong></td>
<td><strong>1,047.8</strong></td>
</tr>
</tbody>
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**FY 2018**

**Distribution of Funds**

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount (M)</th>
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<tr>
<td>Direct Labor</td>
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<tr>
<td>General Overhead</td>
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<tr>
<td>Indirect Overhead</td>
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<tr>
<td>Direct Material, Travel, and Other</td>
<td>142.7</td>
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<tr>
<td>Direct Contracts</td>
<td>426.1</td>
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<tr>
<td><strong>Total Costs</strong></td>
<td><strong>1,075.4</strong></td>
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</table>

*Costs based on CFO statements; direct contracts include costs for reimbursable-funded contracts and obligations for direct cite-funded contracts.
FY 2017 Total New Funds by Category

Distribution of RDT&E, Navy (%)

- BA1: Basic Research - 23.3%
- BA2: Applied Research - 16.4%
- BA3: Advanced Technology Development - 6.7%
- BA4: Advanced Component Development Prototypes - 7.8%
- BA5: System Development and Demonstration - 15.1%
- BA6: RDT&E Management Support - 30.6%
- BA7: Operational System Development - 3.2%

Subtotal RDT&E: $586.1M

Distribution of Total (%) ($1,122.1M)

- RDT&E, Navy: 52.2%
- RDT&E, Non-Navy: 23.3%
- Other Non-Navy: 13.8%
- Other Navy: 0.0%
- O&M, Navy: 4.4%
- Proc., Navy: 6.3%

FY 2017

<table>
<thead>
<tr>
<th>Category</th>
<th>Navy</th>
<th>Non-Navy</th>
<th>Total</th>
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<tr>
<td>BA1: Basic Research</td>
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<td>144.9</td>
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<td>BA2: Applied Research</td>
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<td>211.0</td>
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<td>BA3: Advanced Technology Development</td>
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<td>162.7</td>
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<tr>
<td>BA4: Advanced Component Development Prototypes</td>
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<td>12.3</td>
<td>108.5</td>
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<tr>
<td>BA5: System Development and Demonstration</td>
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<td>13.5</td>
<td>52.7</td>
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<tr>
<td>BA6: RDT&amp;E Management Support</td>
<td>27.5</td>
<td>13.5</td>
<td>41.0</td>
</tr>
<tr>
<td>BA7: Operational System Development</td>
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<td>19.0</td>
<td>37.8</td>
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<tr>
<td>Subtotal RDT&amp;E</td>
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<td>261.1</td>
<td>847.2</td>
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<tr>
<td>Operations and Maintenance</td>
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<tr>
<td>Procurement</td>
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<tr>
<td>Other</td>
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<td>76.1</td>
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<tr>
<td>Total New Funds</td>
<td>706.1</td>
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## FY 2018 Total New Funds by Category

### FY 2018

<table>
<thead>
<tr>
<th>Category</th>
<th>Navy</th>
<th>Non-Navy</th>
<th>Total</th>
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<tbody>
<tr>
<td>Basic Research (BA1)</td>
<td>139.0</td>
<td>8.5</td>
<td>147.5</td>
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<tr>
<td>Applied Research (BA2)</td>
<td>174.3</td>
<td>32.5</td>
<td>206.7</td>
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<tr>
<td>Advanced Technology Development (BA3)</td>
<td>49.8</td>
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<td>209.1</td>
</tr>
<tr>
<td>Advanced Component Development Prototypes (BA4)</td>
<td>69.8</td>
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<tr>
<td>System Development and Demonstration (BA5)</td>
<td>60.1</td>
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<td>Operational System Development (BA7)</td>
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<tr>
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<td>52.9</td>
<td>78.7</td>
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<tr>
<td>Other</td>
<td>0.0</td>
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<tr>
<td><strong>Total New Funds</strong></td>
<td>654.0</td>
<td>456.9</td>
<td>1,110.8</td>
</tr>
</tbody>
</table>

### Distribution of RDT&E, Navy (%)

- BA1: 23.8%
- BA2: 30.0%
- BA3: 8.6%
- BA4: 12.0%
- BA5: 10.3%
- BA6: 12.2%
- BA7: 3.1%

### Distribution of Total (% ($1,110.8))

- RDT&E, Navy: 52.4%
- RDT&E, Non-Navy: 27.8%
- Other Navy: 13.3%
- O&M, Navy: 4.2%
- Other Non-Navy: 13.3%
Personnel Information

Civilian On-Board
Full-Time, Permanent (FTP)
- Graded: 2,462
- Ungraded: 96
- Total: 2,558

Temporary, Part-Time, Intermittent (TPTI)
- TPTI: 166
- Total Civilian: 2,724

FTP Breakdown
- Scientific/Engineering Professional: 1,654
- Scientific/Engineering Technical: 104
- Administrative Specialist/Professional: 438
- Administrative Support: 234
- Senior Executive Service: 16
- Scientific or Professional: 16
- General Schedule: 0
- Total: 2,462

Military On-Board
- Officers: 38
- Enlisted: 58
- Total Military On-Board: 96
- (Military Allowance) Total: 106

Annual Civilian Turnover Rate (%) (permanent employees only)

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
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<td>Nonresearch areas</td>
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<td>15.7</td>
<td>16.4</td>
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<td>Entire Laboratory</td>
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<td>10.3</td>
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Highest Academic Degrees Held by Civilian Full-Time Permanent Employees

- Bachelors: 603
- Masters: 484
- Doctorates: 889

*All data is as of December 31, 2018.*
Professional Development

Programs for NRL Employees

The NRL Human Resources Office (HRO) supports and provides traditional and alternative methods of training for employees. NRL employees are encouraged to develop their skills and enhance their job performance so they can meet the current and future needs of NRL and enhance their own personal development.

LONG-TERM TRAINING AND DEVELOPMENTAL PROGRAMS

The Advanced Graduate Research Program enables selected professional employees to pursue collaborative research in their own field or a related field on a full-time basis for up to one year at an institution or research facility of their choice. Participants receive full pay and benefits. NRL pays all travel and moving expenses for the employee. Criteria for eligibility include professional stature consistent with the applicant’s opportunities and experience, the ability and special aptitude for advanced training, and acceptance by the facility selected by the applicant. The program is open to employees who have completed six years of Federal service, four of which have been at NRL by the commencement of the program.

The Edison Memorial Graduate Training Program enables employees to pursue graduate-level work that may lead to a graduate degree at a local university. Participants in this program normally work 24 hours per week at the work site, while carrying an appropriate academic load of either graded, credited classes or dissertation research credits. The criteria for eligibility include a minimum of one year of Federal service at NRL by program commencement, a bachelor’s degree in an appropriate field, professional stature consistent with the applicant’s opportunities and experience, and the ability and special aptitude for advanced training.

The Select Graduate Training Program develops employees of exceptional talent by assisting them in full-time graduate study that may lead to the acquisition of a graduate degree at a facility of their choice within the continental United States. To be eligible for this program, employees must possess at least a bachelor’s degree in an appropriate field, have completed at least one full year of Federal service at NRL by program commencement, and have demonstrated ability and aptitude for advanced training. Students accepted into this program receive one-half of their salary and one-half of their benefits. NRL pays for tuition and travel expenses.

The Naval Postgraduate School (NPS), located in Monterey, California, provides graduate programs to enhance the technical preparation of Naval officers and civilian employees who serve the Navy in the fields of science, engineering, operations analysis, and management. This program enables employees to pursue full-time graduate studies that may lead to the completion of a graduate degree. Thesis work will be accomplished at NRL. To be eligible for this program, employees must possess at least a bachelor’s degree in an appropriate field and must have maintained at least a 3.0 GPA in undergraduate course work or previous graduate studies. Employees must also have completed at least two full years of Federal service at NRL, have demonstrated the ability and aptitude for advanced training, and have professional stature consistent with the applicant’s opportunities and experience. Participants in the NPS program will continue to receive full pay and benefits during their periods of study. NRL also pays for tuition and travel expenses.

In addition to NRL and university offerings, applications may be submitted for a number of noteworthy Navy developmental programs. These and other fellowship programs are grade-specific, and the courses vary in length. A few examples of these opportunities are the Aspiring Leader Program (ALP), Defense Civilian Emerging Leader Program (DCELP), Executive Leadership Development Program (ELDP), and the Defense Senior Leader Development Program (DSLDP). Announcements for these programs are posted on the HRO web page as schedules are published.
CONTINUING EDUCATION

Undergraduate and graduate courses offered at local colleges and universities may be subsidized by NRL for employees interested in improving their skills and keeping abreast of current developments in their fields.

NRL offers short courses to all employees in a number of fields of interest, including administrative subjects and supervisory and management techniques. Laboratory employees may also attend these courses at nongovernment facilities. HRO advertises training opportunities on Pipeline, the HRO website, and in the email newsletter HRO Highlights.

For further information on any of the Long-Term Training, Leadership Development, and Continuing Education programs, contact the Employee Development and Management Branch (Code 1840) at (202) 767-8306 or via email at Training@hro.nrl.navy.mil.

The Scientist-to-Sea Program (STSP) provides opportunities for Navy R&D laboratory/center personnel to go to sea to gain firsthand insight into operational factors affecting system design, performance, and operations on a variety of ships. NRL is a participant in the program. When these opportunities become available from ONR, NRL divisions are informed to nominate candidates. For further information, call (202) 404-2701.

PROFESSIONAL DEVELOPMENT

NRL has several programs, professional society chapters, and informal clubs that enhance the professional growth of employees. Some of these are listed below.

The NRL chapter of Women In Science and Engineering (WISE) was established to address current issues concerning the scientific community of women at NRL, such as networking, funding, work-life satisfaction, and effective use of our resources. We address these issues by empowering members through the establishment of a supportive and constructive network that serves as a sounding board to develop solutions that address said issues, and then serve as a platform in which members work together to implement solutions. Recently, WISE hosted Dr. Stephanie Tompkins of DARPA, Dr. Wen Masters of ONR, and a summer career panel with guest lecturer Dr. Brenda Little. The NRL WISE organization also provided feedback that led to an official NRL lactation policy and NRL's first-ever lactation room as well as support for adding more spaces and other improvements. Membership in WISE is open to all employees. For more information call (202) 767-9549.

Sigma Xi, The Scientific Research Society, encourages and acknowledges original investigation in pure and applied science. It is an honor society for research scientists. Individuals who have demonstrated the ability to perform outstanding research are elected to membership in local chapters. The NRL Edison Chapter, comprising approximately 200 members, recognizes exceptional research by presenting annual awards in pure and applied science to two outstanding NRL staff members per year. In addition, an award seeking to reward rising stars at NRL is presented annually through the Young Investigator Award. The chapter also sponsors several lectures per year at NRL on a wide range of topics of general interest to the scientific and DoD community. These lectures are delivered by scientists from all over the world. The highlight of the Sigma Xi Lecture Series is the Edison Memorial Lecture, which traditionally is given by an internationally distinguished scientist. Call (202) 767-0351.

The NRL Mentor Program was established to provide an innovative approach to professional and career training and an environment for personal and professional growth. It is open to permanent NRL employees in all job series and at all sites. Mentees are matched with successful, experienced colleagues who have more technical or managerial experience and who can provide mentees with the knowledge and skills needed to maximize their contribution to their immediate organization, to NRL, the Navy, and their chosen career fields. The ultimate goal of the program is to increase job productivity, creativity, and satisfaction through better communication, understanding, and training. NRL Instruction 12400.1B provides policy and procedures for the program. For more information,
please email mentor@hro.nrl.navy.mil or call (202) 767-8324.

Employees interested in developing effective self-expression, listening, thinking, and leadership potential are invited to join the NRL Forum Toastmasters Club, a chapter of Toastmasters International. Members of this club possess diverse career backgrounds and talents and learn to communicate not by rules but by practice in an atmosphere of understanding and helpful fellowship. NRL’s Commanding Officer and Director of Research endorse Toastmasters. Call (202) 404-4670.

The Department of the Navy Civilian Employee Assistance Program (DONCEAP) provides confidential assessment, referral, and short-term counseling for employees (or their eligible family members) to help resolve personal concerns that otherwise might adversely affect job performance, such as challenging relationships (at work or home); dealing with stress, anxiety, or depression; grief and loss; or substance abuse. The DONCEAP also provides work/life referral services, such as “live” or on-demand webinars; discussion groups; and advice on parenting, wellness, financial and legal issues, education, and much more. Call (844) 366-2327, or visit http://donceap.foh.hhs.gov.

**EQUAL EMPLOYMENT OPPORTUNITY (EEO) PROGRAMS**

NRL provides equal employment opportunity (EEO) for all employees regardless of race, color, national origin, sex, religion, age, physical or mental disability, or genetic information. The NRL EEO Office is a service organization responsible for counseling employees to resolve employee/management conflicts, processing formal discrimination complaints and requests for reasonable accommodation, providing EEO training, and managing NRL’s MD-715 and affirmative employment recruitment programs. The NRL EEO Office is also responsible for sponsoring special-emphasis programs to promote awareness and increase sensitivity and appreciation of the issues or the history relating to females, individuals with disabilities, and minorities. Contact the NRL Deputy EEO Officer at (202) 767-8390 for additional information on programs and services.

**OTHER ACTIVITIES**

NRL’s Community Outreach Program emphasizes STEM education. Managed by the Public Affairs Section of the Strategic Communication Office, the program is designed to inspire, engage, educate, and employ the next generation of scientists and educators. The robust program originated in response to our nation placing a high priority on STEM education and workforce development.

The NRL Community Outreach Program continues to grow many STEM initiatives aimed at K–12 and its primary audience of undergraduate, graduate, and post-doctoral students. At the K–12 level, the program partners with researchers to create STEM-inspired presentations that fit education lesson plans for hands-on activities. The program also reaches out to students in institutions of higher learning who are considering STEM careers, and fosters collaboration between colleges and universities and NRL researchers. Lecture series, STEM demonstrations, Q&As, digital engagements, and STEM competitions focused on the needs of the Navy are primary program drivers.

NRL volunteer mentors actively engage in judging science fairs, guiding science projects, and employing interns, and vigorously support STEM competitions. At the end of each year, an annual holiday party is held for DC-neighborhood schoolchildren. Through the Community Outreach Program, NRL has built active partnerships with several District of Columbia public schools. To find out how you can get involved, contact the STEM Outreach Coordinator at (202) 767-2541.

Other programs that enhance the development of NRL employees include sports groups and the Amateur Radio Club. The NRL Fitness Center at NRL-DC, managed by Naval Support Activity Washington Morale, Welfare and Recreation (NSAW-MWR), houses a fitness room with treadmills, bikes, ellipticals, step mills, and a full strength circuit; a gymnasium for basketball, volleyball, and other activities; and full locker rooms. The Fitness Center is free to NRL employees and contractors. NRL employees are also eligible to participate in all NSAW-MWR activities on Joint Base Anacostia–Bolling and Washington Navy Yard, less than five miles down the road from the NRL D.C. campus.
Programs for Non-NRL Employees

Several programs have been established for non-NRL professionals. These programs encourage and support the participation of visiting scientists and engineers in research of interest to the Laboratory. Some of the programs may serve as stepping-stones to Federal careers in science and technology. Their two-fold objective is to enhance the quality of the Laboratory’s research activities through working associations and interchanges with highly capable scientists and engineers and provide opportunities for outside scientists and engineers to work in the Navy laboratory environment. Along with enhancing the Laboratory’s research, these programs acquaint participants with Navy capabilities and concerns, and may provide a path to full-time employment at NRL.

POSTDOCTORAL RESEARCH ASSOCIATESHIPS

Every year, NRL hosts several postdoctoral research associates through the National Research Council (NRC) and American Society for Engineering Education (ASEE) postdoctoral associate and fellowship programs. These competitive positions provide postdoctoral scientists and engineers with the opportunity to pursue research at NRL in collaboration with NRL scientists and engineers. Research associates are guest investigators, not employees of NRL.

NRL/NRC Cooperative Research Associateship Program: The National Research Council conducts a national competition to recommend and make awards to outstanding scientists and engineers at recent postdoctoral levels for tenure as guest researchers at participating laboratories. The objectives of the NRC program are (1) to provide postdoctoral scientists and engineers of unusual promise and ability opportunities for research on problems, largely of their own choice, that are compatible with the interests of the sponsoring laboratories and (2) to contribute thereby to the overall efforts of the Federal laboratories. The program provides an opportunity for concentrated research in association with selected members of the permanent professional laboratory staff, often as a climax to formal career preparation.

NRL/NRC Postdoctoral Associateships are awarded to individuals who have held a doctorate less than five years at the time of application. The awards are made initially for one year, renewable for a second and possible third year. Information and applications may be found at http://www.national-academies.org/rap. To contact NRL’s program coordinator, call (202) 767-8323 or email nrc@hro.nrl.navy.mil.

NRL/ASEE Postdoctoral Fellowship Program: The ASEE program is designed to significantly increase the involvement of creative and highly trained scientists and engineers from academia and industry in scientific and technical areas of interest and relevance to the Navy. Fellowship awards are based upon the technical quality and relevance of the proposed research, recommendations by the Navy laboratory, academic qualifications, reference reports, and availability of funds.

NRL/ASEE Fellowship awards are made to individuals who have held a doctorate for less than five years at the time of application. The awards are made for one year, renewable for a second and possible third year. Information and applications may be found at http://www.asee.org/nrl/. To contact NRL’s program coordinator, call (202) 767-8323 or email asee@hro.nrl.navy.mil.

FACULTY MEMBER PROGRAMS

The Office of Naval Research Summer Faculty Research and Sabbatical Leave Program provides opportunities for university faculty members to work for 10 weeks (or longer, for those eligible for sabbatical leave) with professional peers in participating Navy laboratories on research of mutual interest. Applicants must hold a teaching or research position at a U.S. college or university. Contact NRL’s program coordinator at sfrp@hro.nrl.navy.mil.

The NRL/United States Naval Academy Cooperative Program for Scientific Interchange allows faculty members of the U.S. Naval Academy (USNA) to participate in NRL research. This collaboration benefits the Academy by providing the opportunity for USNA faculty members to work...
on research of a more practical or applied nature. In turn, NRL’s research program is strengthened by the available scientific and engineering expertise of the USNA faculty. Contact NRL’s program coordinator at usna@hro.nrl.navy.mil.

PROFESSIONAL APPOINTMENTS

Faculty Member Appointments use the special skills and abilities of faculty members for short periods to fill positions of a scientific, engineering, professional, or analytical nature at NRL.

Consultants and experts are employed because they are outstanding in their fields of specialization or because they possess ability of a rare nature and could not normally be employed as regular civil servants.

Intergovernmental Personnel Act Appointments temporarily assign personnel from state or local governments or educational institutions to the Federal government (or vice versa) to improve public services rendered by all levels of government.

STUDENT PROGRAMS

The student programs are tailored to high school, undergraduate, and graduate students to provide employment opportunities and work experience in naval research.

The Naval Research Enterprise Intern Program (NREIP) is a 10-week summer research opportunity for undergraduate sophomores, juniors, and seniors, and graduate students. The Office of Naval Research (ONR) offers summer appointments at Navy laboratories to current college sophomores, juniors, seniors, and graduate students from participating schools. Application is online at www.asee.org/nreip through the American Society for Engineering Education. Electronic applications are sent for evaluation to the point of contact at the Navy laboratory identified by the applicant. Contact NRL’s program coordinator at nreip@nrl.navy.mil.

The National Defense Science and Engineering Graduate Fellowship Program helps U.S. citizens obtain advanced training in disciplines of science and engineering critical to the U.S. Navy. The three-year program awards fellowships to recent outstanding graduates to support their study and research leading to doctoral degrees in specified disciplines such as electrical engineering, computer sciences, material sciences, applied physics, and ocean engineering. Award recipients are encouraged to continue their study and research in a Navy laboratory during the summer. Contact NRL’s program coordinator at (202) 404-7450 or ndseg@hro.nrl.navy.mil.

The Pathways Intern Program (formerly STEP and SCEP) provides students enrolled in a wide variety of educational institutions, from high school to graduate level, with opportunities to work at NRL and explore Federal careers while still in school and while getting paid for the work performed. Students can work full-time or part-time on a temporary or non-temporary appointment. Students must be continuously enrolled on at least a half-time basis at a qualifying educational institution and be at least 16 years of age. The primary focus of our Non-temporary intern appointment is to attract students enrolled in undergraduate and graduate programs in engineering, computer science, or the physical sciences. Students on non-temporary appointments are eligible to remain on their appointment until graduation and may be non-competitively converted to a permanent appointment within 120 days after completion of degree requirements. Conversion is not guaranteed. Conversion is dependent on work performance, completion of at least 640 hours of work under the intern appointment before completion of degree requirements, and meeting the qualifications for the position. The Temporary intern appointment is initially a one-year appointment. This program enables students to earn a salary while continuing their studies and offers them valuable work experience. NRL’s Pathways Intern Program opportunities are announced on USAJOBS four times per year. Visit USAJOBS at https://www.usajobs.gov/ to create an account, search for jobs, set up an email notification alert of when positions of interest are posted (see “Saved Searches”), and apply for our intern opportunities when they are posted. For additional information on NRL’s Intern Program, visit http:// hroffice.nrl.navy.mil/student/student_only.asp or call (202) 767-8313.

The STEM Student Employment Program (SSEP) provides paid employment opportunities for undergraduate and graduate degree-seeking students enrolled in scientific, technical, engineering, or mathematics majors. Appointments are made to Science and Engineering Professional (NP) or Science and Engineering Technical (NR) career track positions in the competitive service. Appointments can
be temporary (NTE 1 year), term (no more than 4 years), or flexible length appointments that expire 120 days after completion of the academic course of study. Upon completion of the degree program, SSEP participants may be noncompetitively converted to permanent NP career track positions, provided the OPM science and engineering qualification requirements are met and the candidate is otherwise eligible. Applicants for NP career track positions must have at least a 3.0 GPA, and applicants for NR career track positions must have at least a 2.5 GPA. Applications are accepted year-round. For additional information, visit https://hroffice.nrl.navy.mil/student/pdf/STEM_ StudentDirectHire.pdf.

The Department of Defense Science and Engineering Apprenticeship Program (SEAP) provides an opportunity for high school students, who have completed at least grade 9 and are at least 15 years of age, to serve as junior research associates. Under the direction of a mentor, for eight weeks in the summer, students gain a better understanding of research — its challenges and its opportunities — through participation in scientific, engineering, and mathematics programs. Criteria for eligibility are based on science and mathematics courses completed and grades achieved; scientific motivation, curiosity, and the capacity for sustained hard work; a desire for a technical career; teacher recommendations; and exceptional test scores. The NRL program is the largest in the Department of Defense. For detailed information, visit https://seap.asee.org/, email seap@hro.nrl.navy.mil, or call (202) 767-8324.

The Summer Research Program for Historically Black College or University (HBCU) or Minority Institution (MI) is a 10-week summer internship program that provides opportunities for undergraduate and graduate students to participate in research under the guidance of a mentor at NRL. Preference is given to students planning careers in science, technology, engineering, and mathematics (STEM) disciplines. Applicants must be U.S. citizens or have permanent residency and be enrolled at an HBCU, MI, or Tribal College or University. Participating students receive a stipend. Information and application materials are available online at the TWCIAS-NRL HBCU Information Page. Online applications can be found at http://nrl.e.twc.edu/.

**VOLUNTEER OPPORTUNITIES**

The Student Volunteer Program helps students gain valuable experience by allowing them to voluntarily perform educationally related work at NRL. It provides exposure to the work environment and also provides an opportunity for students to make realistic decisions regarding their future careers. Applications are accepted year-round. For additional information, visit http://hroffice.nrl.navy.mil/student/student_only.asp or call (202) 767-8313.
Directions TO NRL from Ronald Reagan Washington National Airport

1 Follow Route 1 South for approximately 3 miles to the Beltway I-95/I-495.

2 Exit right to the Beltway. This exit curves to the right and then divides. Take the left fork to I-95 (Baltimore). Stay in local lanes.

3 Stay in the right lane on the Woodrow Wilson Bridge. After crossing the Woodrow Wilson Bridge, take the first exit (I-295). This exit divides. Take the left fork to I-295 North.

4 NRL is the first exit off of I-295 (approximately 2 miles) after crossing the Woodrow Wilson Bridge.

5 Make a right at the traffic light in front of the main gate (Overlook Avenue). Then make an immediate left into the parking lot. The Visitor Control Center (Building 72) is located on the corner in the brick building next to the main gate.
Location of Buildings at NRL Washington
Location of Field Sites in the NRL Washington Area

<table>
<thead>
<tr>
<th>Location</th>
<th>Approximate Mileage from NRL Washington</th>
<th>Cognizant Code</th>
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</thead>
<tbody>
<tr>
<td>A – Chesapeake Bay Section, Chesapeake Beach, MD</td>
<td>40</td>
<td>3522</td>
</tr>
<tr>
<td>B – Tilghman Island, MD</td>
<td>110</td>
<td>3522</td>
</tr>
<tr>
<td>C – Patuxent River (MD) Naval Air Station</td>
<td>64</td>
<td>1600</td>
</tr>
<tr>
<td>D – Pomonkey, MD</td>
<td>20</td>
<td>8124</td>
</tr>
<tr>
<td>E – Midway Research Center, Quantico, VA</td>
<td>38</td>
<td>8140</td>
</tr>
<tr>
<td>F – Blossom Point, MD</td>
<td>40</td>
<td>8140</td>
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Chesapeake Bay Section (Chesapeake Beach, Maryland)

Access Routes to Chesapeake Bay Section

U.S. Naval Research Laboratory
Chesapeake Bay Section
5813 Bayside Road
Chesapeake Beach, MD 20732
(301) 257-4002
Location of Buildings at the Chesapeake Bay Section

<table>
<thead>
<tr>
<th>Building No.</th>
<th>Purpose</th>
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<tbody>
<tr>
<td>1</td>
<td>Test Control/BOS Contractor</td>
</tr>
<tr>
<td>2</td>
<td>Laboratory/Office</td>
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<tr>
<td>4</td>
<td>Laboratory/Office</td>
</tr>
<tr>
<td>5</td>
<td>Laboratory/Office</td>
</tr>
<tr>
<td>6</td>
<td>Office</td>
</tr>
<tr>
<td>15</td>
<td>Garage/Shops</td>
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<tr>
<td>29</td>
<td>Laboratory/Storage</td>
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<tr>
<td>47</td>
<td>Security Office/Storage</td>
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<td>49</td>
<td>Laboratory/Storage</td>
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<tr>
<td>50</td>
<td>Fire Department</td>
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<tr>
<td>55</td>
<td>Storage</td>
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<tr>
<td>75</td>
<td>Laboratory/Office</td>
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<tr>
<td>76</td>
<td>Shop/Storage</td>
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<tr>
<td>79</td>
<td>Central Heating Plant</td>
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<td>84</td>
<td>Sewage Treatment Plant</td>
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<tr>
<td>88</td>
<td>Shop</td>
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<tr>
<td>218</td>
<td>HV Gun Facility</td>
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<tr>
<td>228</td>
<td>Laboratory</td>
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<tr>
<td>244</td>
<td>Storage</td>
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<td>249</td>
<td>Laboratory/Office</td>
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<td>Laboratory/Shop</td>
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<td>252</td>
<td>Fire Research Test Deck</td>
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<td>Laboratory/Office</td>
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<td>302</td>
<td>Fire II Chamber</td>
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U.S. Naval Research Laboratory Monterey
(Monterey, California)

U.S. Naval Research Laboratory
Marine Meteorology Division
7 Grace Hopper Avenue
Monterey, CA 93943-5502
(831) 656-4721
## Key Personnel

**DSN: NRL Washington 297- or 754-; NRL/SSC 828-; NRL/Monterey 878-; NRL VXS-1/Patuxent River 342-**

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>1000</td>
<td>(202) 767-3403</td>
<td>Commanding Officer</td>
</tr>
<tr>
<td>1000.1</td>
<td>(202) 404-3309</td>
<td>Inspector General</td>
</tr>
<tr>
<td>1000.2</td>
<td>(202) 767-8390</td>
<td>Deputy Equal Employment Opportunity Officer</td>
</tr>
<tr>
<td>1001</td>
<td>(202) 767-3301</td>
<td>Director of Research</td>
</tr>
<tr>
<td>1001.1</td>
<td>(202) 767-2445</td>
<td>Executive Assistant to the Director of Research</td>
</tr>
<tr>
<td>1001.2</td>
<td>(202) 767-3421</td>
<td>Head, Strategic Workforce Planning</td>
</tr>
<tr>
<td>1001.3</td>
<td>(202) 767-0851</td>
<td>Executive Assistant for Technology Deployment</td>
</tr>
<tr>
<td>1002</td>
<td>(202) 767-3621</td>
<td>Executive Officer</td>
</tr>
<tr>
<td>1004</td>
<td>(202) 767-3083</td>
<td>Head, Office of Technology Transfer</td>
</tr>
<tr>
<td>1006</td>
<td>(202) 767-1312</td>
<td>Head, Office of Program Administration and Policy Development</td>
</tr>
<tr>
<td>1008</td>
<td>(202) 767-2244</td>
<td>Head, Office of Counsel</td>
</tr>
<tr>
<td>1030</td>
<td>(202) 404-3322</td>
<td>Head, Strategic Communications Office</td>
</tr>
<tr>
<td>1100</td>
<td>(202) 767-1803</td>
<td>Director, Institute for Nanoscience</td>
</tr>
<tr>
<td>1200</td>
<td>(202) 404-1004</td>
<td>Head, Mission Support Division/STILO</td>
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<tr>
<td>1220</td>
<td>(202) 767-0213</td>
<td>Head, Information Assurance and Communications Security</td>
</tr>
<tr>
<td>1250</td>
<td>(202) 767-2232</td>
<td>Head, Safety Branch</td>
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<tr>
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<td>Head, Military Support Division</td>
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<tr>
<td>1400</td>
<td>(202) 767-2273</td>
<td>Commanding Officer, Scientific Development Squadron One (VXS-1) (PAX River NAS)</td>
</tr>
<tr>
<td>1600</td>
<td>(301) 342-3751</td>
<td>Director, Laboratory for Autonomous Systems Research</td>
</tr>
<tr>
<td>1800</td>
<td>(202) 767-3792</td>
<td>Director, Human Resources Office</td>
</tr>
<tr>
<td>1900</td>
<td>(202) 767-9225</td>
<td>Head, Cyber Operations Division</td>
</tr>
<tr>
<td>3000</td>
<td>(202) 767-2371</td>
<td>Associate Director of Research for Business Operations</td>
</tr>
<tr>
<td>3002</td>
<td>(202) 767-7622</td>
<td>Deputy Associate Director of Research for Business Operations</td>
</tr>
<tr>
<td>3005</td>
<td>(202) 767-0666</td>
<td>Deputy for Small Business</td>
</tr>
<tr>
<td>3030</td>
<td>(202) 404-3659</td>
<td>Head, Management Information Systems Office</td>
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<td>3100</td>
<td>(202) 404-1099</td>
<td>Head, Enterprise Resource Planning (ERP) Business Systems Division</td>
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<tr>
<td>3200</td>
<td>(202) 767-5227</td>
<td>Head, Contracting Division</td>
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<tr>
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<td>(202) 767-3405</td>
<td>Head, Financial Management Division</td>
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<tr>
<td>3400</td>
<td>(202) 767-3446</td>
<td>Head, Supply and Administration Services Division</td>
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<td>3500</td>
<td>(202) 404-4054</td>
<td>Director, Research and Development Services Division</td>
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<td>5000</td>
<td>(202) 767-3525</td>
<td>Associate Director of Research for Systems</td>
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<td>5300</td>
<td>(202) 404-2700</td>
<td>Superintendent, Radar Division</td>
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<td>Superintendent, Information Technology Division/NRL Command Information Officer</td>
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<td>5600</td>
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<td>5700</td>
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<td>Associate Director of Research for Materials Science and Component Technology</td>
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<td>6040</td>
<td>(202) 767-3055</td>
<td>Director, Laboratories for Computational Physics and Fluid Dynamics</td>
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<td>6900</td>
<td>(202) 404-6000</td>
<td>Director, Center for Bio/Molecular Science and Engineering</td>
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<td>7000</td>
<td>Associate Director of Research for Ocean and Atmospheric Science and Technology (202) 404-8690</td>
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<td>7030</td>
<td>Head, Office of Research Support Services (228) 688-4010</td>
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<td>7300</td>
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<td>7500</td>
<td>Superintendent, Marine Meteorology Division (831) 656-4721</td>
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<td>7600</td>
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Human Resources Office  
Personnel Operations Branch (Code 1810)  
U.S. Naval Research Laboratory  
Washington, DC 20375-5320

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### Quick Reference Telephone Numbers

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<th><strong>NRL-SSC</strong></th>
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<td><strong>Hotline</strong></td>
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<td><strong>Personnel Locator</strong></td>
<td>(202) 767-3200</td>
<td>(228) 688-3390</td>
<td>(831) 656-4763</td>
<td>(410) 257-4000</td>
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<td><strong>DSN</strong></td>
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<td><strong>SCO</strong></td>
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Additional telephone numbers are listed on pages 133 and 134.