The FY09 has ended with a “bang,” with an increase of over twenty percent in sponsored program activities. The NPS Annual Sponsored Activity Report will be completed within the next month and made available to the campus as well as distributed to our outside customers/stakeholders. As you can see from this issue, receipts of sponsored funding exceeded $225M. Preliminary execution reports indicate over $150M expended in FY09; this is up from $118M in FY08.

For FY10, the RSPO will continue to focus on providing adequate staffing and streamlining processes supporting the principal investigator/program manager (PI/PM) of sponsored activities. The campus is transitioning to KUALI, a management-information system for financial reporting. The full implementation of KUALI will provide the PI/PM with a more robust tool for managing their sponsored project accounts.

As we continue to grow our sponsored programs, the compliance requirements become increasingly important. Many of you have asked why “accountability training” is required each year. The completion of accountability training and the attestation process are two cornerstones of NPS accountability compliance. These two processes assure that the PI/PMs receive information on their responsibilities (accountability training) and have the opportunity to review their expenditures to assure all transactions are appropriate to their accounts (attestation). We count on you for your input and your support. As mentioned in the accountability modules, the responsibility for accountability is a shared effort…a shared responsibility. We endeavor to work with you to assure both processes are effective.

## Important Dates

### Brown-Bag Seminar Series
- Contracting for Support Services, Thurs, 10/22, 1200, SP 101A
- Working with Industry, Mon, 11/24, 1200, SP 101A
- National Research Council Postdoctoral Associateship Program at NPS, 12/9, 1200, MAE Conference Room

### Workshops
- NPS Cyber Security Workshop, Thurs, 10/29, Glasgow Hall (contact Dean Purdue, ppurdue@nps.edu for further info)

### NPS Research Initiation Program
- Proposals (Year One): Due one month before research quarter begins
- Progress Reports (Year Two): Due 10/15 2009

**Beginning FY10**
- Rollover accounts are available for expenditure 1 October; see your SPFA for balance available. Budget pages are being issued if PI/PM have completed accountability training.
- Accountability training (Fiscal Law, Accountability, Human Subject Protection) must be completed for release of FY10 funding. (See exception for labor below.)
- Labor should be charged to appropriate source from beginning of fiscal year; labor charges are allowed for first two pay periods regardless of whether accountability training has been completed.
- Interim accounts for sponsored activity that must begin prior to receipt of funds should be requested ASAP. Interims require proposal of record and confirmation from sponsor on intent to fund.
- Acceleration rates are 45% for both faculty and staff.

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**RESEARCH AT NPS**

**VOLUME I, NO. 5  SEPTEMBER 2009**

**By Type of Activity**

- Research 49% $111M
- Service 38% $85.1M
- Education 12% $27.2M

**By Sponsor**

- DoD 41% $92M
- Navy 22% $50M
- NSF 5% $10.8M
- Other Fed <1% $988k
- Other-Fed 9% $15.8M
- Air Force 4% $130M
- Army 4% $6.2M
- DHS 11% $24.1M
- DoD 41% $92M
- NSF 5% $10.8M
- Other Fed <1% $988k
- Other-Fed 9% $15.8M
- Air Force 4% $130M
- Army 4% $6.2M
- DHS 11% $24.1M
- DoD 41% $92M

**By School**

- SIGS 19% $29.8M
- GSEAS 35% $55.8M
- Joint 6% $14.1M
- GSBPP 6% $9.6M
- GSEAS 35% $55.8M
- SIGS 19% $29.8M
- GSOIS 21% $33.5M

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Danielle Kuska, Director
Research and Sponsored Programs Office
research@nps.edu

Research and Sponsored Programs Office (RSPO)
Office of the Vice President and Dean of Research
Naval Postgraduate School
Graduate School of Engineering and Applied Sciences

By Department

Funds received to date: $55.8M

Projects funded in September:
- Manhunting A Search for a Moving Fugitive, Guillermo Owen, Applied Mathematics (United States Military Group Bogata, Columbia)
- Cyber Research to Support GED Mission Areas, Jeffrey Knorr, Electrical & Computer Engineering (SAF/FMBIB-AFOY)
- ECE Distance Learning Program, Jeffrey Knorr, Electrical & Computer Engineering (Fleet Readiness Center SW)
- Tactical HEL Weapon Alignment System Architecture Efficiencies, Brij Agrawal, Mechanical & Astronautical Engineering (ONR)
- Advanced Marine Gas Turbine Technology Programs, Knox Millsaps, Mechanical & Astronautical Engineering (NSWC-Carderock Division)
- Weather Forecasting for Ft Ord Prescribed Burns, Wendell Nuss, Meteorology (USA Corps of Engineering)
- Linking the Surf Zone and Inner Shelf: Cross-Transport Mechanisms, James MacMahan, Oceanography (ONR)
- Collaborative Research: Does Coupling between the Inner Shelf and Surf Zone Regulate Larval Supply to Intertidal Populations, James MacMahan, Oceanography (NSF)
- Collaborative Research: Fingering Convection at Low Prandtl Number, Timour Radko, Oceanography (NSF)
- USAF Project, Richard Olsen, Physics (SAF/FMBIB)
- Modeling and Assessment of the C4ISR OTM Event 09 Architecture, Kristen Giammarco, Systems Engineering (USARDECOM)
- Tunnel Detection Research, Tom Hayreh, System Engineering (TRAC-Monterey)
- SEM PD21, Wally Owen, System Engineering (Various)
- Master of Science in Space Systems Operations Program, Mark Rhoades, System Engineering (Various)
- NSF-Lite Flight Unit for ADaMSaT, James Newman, Space Systems (NSF)

Graduate School of Operational and Information Sciences

By Department

Funds received to date: $33.5M

Projects funded in September:
- OB-1 Evaluation Support, George Dinolt, Computer Science (SPAWAR-Charleston)
- Creating Realistic Forensic Corpora for Undergraduate Education and Research, Simson Garfinkel, Computer Science (NSF)
- Automated Media Exploitation and Information Fusion, Simson Garfinkel, Computer Science (USMC-MARCORSYSCOM)
- Software Engineering Master's Degree Program, Loren Peitso, Computer Science (Various)
- NPS Dark Web Development, Nancy Roberts, Defense Analysis (NETSAFA)
- Center for Edge Power & C2 Chair, Mark Nissen, Information Sciences (OASD)
- Patuxent River Electronic Warfare EW-101 Class, Diane Smith, Information Sciences (NAWC-Weapons Division)
- 2009 Chile-USA Naval Operations Research Workshop, Robert Dell, Operations Research (ONR)
- IATF Social Network Functional Analysis, Paul Ewing, Operations Research (USSOCOM)
- Using Efficient Design of Experiments to Explore the Army’s Equipping Enterprise System, Rachel Johnson, Operations Research (U.S. Army G1)
Projects funded in September:

- Technical Support for NPS Field Experimentation Program, Ray Buettner, Field Experimentation Coop (OSD)
- COMBATXXI: MCCDC Behavior Development and Technical Support, Imre Balogh, MOVES (USMC Combat Development Command)
- Undersea Warfare Extensible Markup Language Working Group for Anti-Submarine Warfare Community of Interest, Donald Brutzman, MOVES (NAVSEA)
- Medical Simulation and Training Technology, Paul Chatelier, MOVES (Telemedicine and Advanced Technology Research Center)
- Building and Sustaining International Security Relationships through Wiki-Based Social Networking and Instant Interactive Applications, Stephen Lieberman, MOVES (OSD)
- $1000D Analysis, Michael McCauley, MOVES (OUSD)
- Game Engines as Basis of Defense-Based, Game-Based Training and Analysis, Perry McDowell, MOVES (Lockheed Martin)
- Tools and Methods Used in the Assessment of Network Security and Interoperability, Joe Sullivan, MOVES (OT&E)
- Collaborative Research II: A Field Guide to the Science of Computation, Peter Denning, Csabrowski (NSF)
- Strategic Change Communications, Sue Higgins, Csabrowski (ONR)
- Research, Development, Analysis of Exercise to Evaluate Mass-Evacuation Plans, David Banks, CAW (City of Los Angeles)
- NPS Academic Support to Joint IED Defeat Organization, Ed Lesnowicz, NSI (JIEDDO)

No NS projects were funded in September.
MILITARY ASSOCIATE DEAN JOINS VP FOR RESEARCH STAFF

CAPT Rod Abbott, USN

Dean of Research Karl van Bibber has named CAPT Rod Abbott, USN, as the military associate dean of research. CAPT Abbott was called back to duty to serve in this role. CAPT Abbott will be an invaluable addition to the research organization, helping with many issues associated with the strong growth of NPS as a research university.

Among his immediate tasks, Rod will lead an ITAR working group to develop a comprehensive plan for the protection of export controlled technology at the school. He will help stand up a research safety group, which is developing a safety plan for program-specific risk areas, such as laser operations, accelerators, and radiation, chemical, and explosive hazards. Rod will work closely with the dean in the upcoming review and continuing oversight of the four research institutes at the school. Finally, he will join an effort in the early stages of formalizing, to explore options for the growth of the NPS research enterprise beyond the current site boundaries.

CAPT Abbott was previously part of the Navy Reserve Science and Technology Program, also known as Navy Reserve Program 38, whose mission is to leverage unique naval reserve capabilities to help the Office of Naval Research and the Naval Research Laboratory provide science and technology solutions to the warfighter. Many reservists within Program 38 combine an exceptional degree of operational and technical expertise in a single individual. Members of Program 38 reside throughout the country, providing the potential for outreach activities in areas where it would otherwise be impractical or uneconomical to provide colleagues.

CAPT Rod Abbott was most recently a physicist at Lawrence Livermore National Laboratory. Among his assignments were serving as deputy project leader for the RRW-2 Phase 1 Study/Sigma 20 Program (Weapons and Complex Integration Directorate) and deputy program leader for RRW-2 Phase 0 and Evaluation and Planning Program, Defense and Nuclear Technologies Directorate. In these positions, he provided technical, engineering, systems analysis and information identification, training, security and control guidance as well as project management management for the Reliable Replacement Warhead (RRW). Other assignments included technical advisor to the AF/XOS Directorate of Strategic Security and Space Operations in the fields of security, nuclear weapons design, directed energy, and counter-proliferation, and technical adviser in use control and special programs for the National Nuclear Security Administration.

CAPT Abbott received an MS in international business from St. Mary’s College, MS in physics from the University of Minnesota, and BA in physics from the University of Minnesota, Morris.

Contact Rod at rpabbott@nps.edu.

WORKING WITH INDUSTRY

NPS works with industry and non-governmental agencies through Cooperative Research and Development Agreements or “work for others.” The following agreements were executed in September 2009:

- Direct Imaging Minority Carrier Diffusion in CZT Crystals, General Electric Company, Nancy Haagel, PH
- Spacecraft Survivability, Lockheed Martin, Simulation, Training and Support, Perry McDowell, MOV/ES
- “Bat” UAS Flight-Training Support, Northrop Grumman, Robert Bluth, CIRPAS

RELATIONSHIPS

The following MOUs/MOAs were executed in September 2009:

- Support for the Chair of Measurement and Signature (MASINT) at NPS, MASINT Office, Chris Olsen, PH
- Joint Education and Research Programs, Naval Sea Systems Command (NAVSEA), CAPT Dan Burns, USN

PATENTS

Two provisional applications were filed in September:

- “Method for Determining Hard Drive Contents through Statistical Drive Sampling,” Navy Case #2009008, Simon Garfinkel, CS; Alexander Nelson, CS
- “Micro-coupling Active Release Mechanism,” Navy Case #2009003, LCDR William Crane, USN; Paul Oppenheimer, NRL, Marcello Romano, MAE; James Newman, SP

USE OF HUMAN SUBJECTS IN RESEARCH

The DoN Human-Research Protection Program Office visited NPS recently to review our program for protecting human subjects used in research. One area noted as inadequate was training for investigators and key personnel. While NPS has provided several training plans in response to the requirement, DoN HRPP has deemed them insufficient and is mandating the training below.

Effective immediately, all researchers (principal investigators, co-investigators and other key personnel, including students) will be required to complete web-based research-ethics training mandated by the DoN Human Research Protection Program Office prior to the review of their research protocol.

Training certificates for all key personnel must be submitted with the research protocol package.

Training will take approximately four to six hours and is found at http://www.med.navy.mil/bumed/humanresearch/Pages/EducationTraining.aspx. The course required is “Social and Behavior Research Basic Course.”

In addition, persons who perform scientific review (notably department chairs/ institute directors) must complete the three modules found at http://www.med.navy.mil/bumed/humanresearch/Pages/EducationTraining.aspx (History and Ethical Principles; Defining Research with Human Subjects; DON HRPP Module). The estimated completion time for these modules is an hour.
Cyber warfare must be an integral component of military operations. For example, anti-access or area denial requires multiple layers of offensive systems, utilizing the sea, land, air, space, and cyberspace. The purpose of a cyberspace strike is to deter the enemy, not to provoke combat. Thus, the objectives selected for a cyber strike must be few and precise. Important adversary information systems such as command and control centers, communications hubs, and other objectives might be targeted. This could impair the operation of adversaries’ systems and organizations and intimidate their policy makers.

The workforce that will staff the nation's cyber organizations, both military and civilian, is currently skeletal and will need to grow in the years ahead. Some functions will require graduate education, and NPS is uniquely qualified to provide it. Research will also be required and should be an integral part of any graduate program.

The overarching strategy of the Center for Cyber Warfare will be to bring focus to an effort to establish alliances between NPS, the operational forces, universities, and the intelligence community. Center research programs will support the education of a new generation of military officers and civilians who will constitute the cyber workforce.

Alliances will be forged through a program of outreach by the center's business group. Center research will assure that related cyber-focused graduate courses remain on the leading edge. The center will bring together existing labs and create new labs to support faculty research and strive to establish a campus-wide secure laboratory environment for cyber research and education. NPS currently has a certified classified environment with adequate spaces, secure connectivity, and some existing funding for classified research and education. It is anticipated that top secret SCI billets will be obtained for faculty, staff, and students at NPS through ODNI sponsored agencies (NSA, NRO, CIA, NGA, and DIA).

Through relationships with these agencies, a research program will be established that supports cyber-centric graduate education for the Navy, DoD, and nation, ensuring a cyber workforce prepared to meet the challenges of the 21st century.
The NPS research centers provide an environment for deep investigation of pressing technical and scientific issues. The centers and their directors are listed below.

- Aerodynamic Decelerator Systems Center, Oleg Yakimenko
- Center for Asymmetric Warfare (CAW), David Banks
- Center for Autonomous Vehicle Research, Doug Horner
- Center for Contemporary Conflict (CCC), Sandra Leavitt
- Center for Cyber Warfare, Jeffrey Knorr
- Center for Defense Management Reform, Douglas Brook
- Center for Edge Power, Mark Nissen
- Center for Homeland Defense and Security, Glen Woodbury
- Center for Information Systems Security Studies and Research (CISR), Cynthia Irvine
- Center for Interdisciplinary Remotely Piloted Aircraft Studies (CIRPAS), Robert Bluth
- Center for Joint Services Electronic Warfare, Phillip Pace
- Center for Material Sciences, Terry McNelley
- Center for Measurement and Signal Intelligence Research, David Trask
- Center for Network Innovation and Experimentation (CENETIX), Alex Bordetsky
- Center for Radiation-Hardened Electronics, Todd Weatherford
- Center for the Study of Mobile Devices and Communications, Gurminder Singh
- Center for the Study of Potential Outcomes, Ted Lewis
- Center for Survivability and Lethality, Chris Adams
- Center on Terrorism and Irregular Warfare, David Tucker
- Remote-Sensing Center, Chris Olen
- SEED Center for Data Farming, Susan Sanchez/Tom Lucas
- Software Engineering Center, Luqi
- Spacecraft Research and Design Center, Brij Agrawal
- Turbo-Propulsion Laboratory, Garth Hobson
- Undersea Warfare Center, RADM Winford (Jerry) Ellis, USN (ret.)

PAGE-PUBLICATION CHARGES

The RSPO processes and funds the page-publication charges associated with journal publications. It is important that the RSPO be notified as soon as a paper is accepted for publication. Faculty authors should not sign any documentation provided by the publisher that states “agreement to pay” any charge. This constitutes an “unauthorized commitment” as only a contracting officer can commit the government to a procurement.

The problematic situation of an unauthorized commitment can be avoided by contacting the RSPO, Hoda Salib, hsalib@nps.edu, as soon as the acceptance for publication is received. Payment of “publication charges” must be processed prior to the publication of the article. The RSPO will also fund journal reprints. RSPO does not fund conference registration fees, however, when an article is being included in the conference proceedings. If you have any questions, please email research@nps.edu.

NPS RESEARCH EXCELLENCE HONORED

The research of Naval Postgraduate School professors I. Michael Ross (MAE) and Wei Kang (MA) and Charles Stark Draper Laboratory collaborators Naz Bedrossian and Sagar Bhatt has been featured as the cover story of the October 2009 issue of IEEE Control Systems Magazine.

Ross, Kang, Bedrossian, and Bhatt’s work constitutes a major breakthrough in space-station guidance. Asked to solve the problem of large-angle reorientation of the International Space Station (ISS) without relying on fuel-gulping thrusters, which consume a million dollars of fuel for a typical 180-degree maneuver, the team developed an innovative technology in which new attitude trajectories were found using a computational optimal-control algorithm developed at NPS.

In contrast to existing trajectories used by NASA, the new ones can take the advantage of complex dynamics and environmental torques so that a large-angle reorientation can be completed can be completed within the momentum capacity of the onboard control-moment gyros—without using thrusters.

As a result, zero-propellant large-angle maneuvering can be achieved without control-momentum saturation, a task formerly considered impossible for ISS.

In addition to saving millions of dollars in fuel cost, this technology provides a new means for ISS reorientation. It also reduces the problem of solar-panel contamination and structural vibration caused by thrusters in maneuvering and in desaturation.

In a wider sense, this work, the culmination of fifteen years’ research, demonstrates that dynamic-optimization methods provide a framework for solving challenging guidance and control problems for highly nonlinear systems in which computational optimization is treated as a first principle in control designs that work in harmony with a feedback architecture.

The PIs look forward to applying their findings to new projects and challenges, the foremost of which is helping NASA return a man to the moon by devising efficient trajectories for the trip home.

They are also collaborating with DoD agencies in porting their results from big satellites to very small, intelligence-gathering nanosatellites and demonstrating autonomy for unmanned ground- and aerial vehicles and improved dexterity for robotic arms. Flight demonstrations of their work are scheduled for 2011 and 2012.