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Research and Sponsored Programs Office (RSPO)

Research Naval Postgraduate School (NPS Research Newsletter), 1

2012-12-01

**Research Naval Postgraduate School, v.5, no.
2, December 2012**

Monterey, California, Research and Sponsored Programs, Office of the Vice
President and Dean of Research, Naval Postgraduate School (U.S.)

<http://hdl.handle.net/10945/30394>

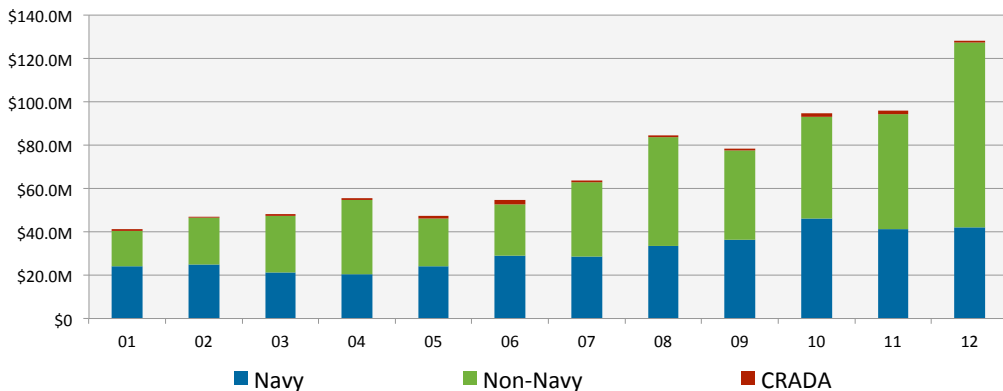
Downloaded from NPS Archive: Calhoun



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Research is fundamental in supporting graduate education. Research at NPS: 1) provides the opportunity for students to demonstrate independent graduate-level scholarship in their area of study; 2) challenges students with creative problem solving experiences on DoD-relevant issues; 3) advances knowledge in a wide range of disciplines relevant to DoN/DoD; 4) solves warfare problems; 5) attracts and retains quality faculty with state-of-the-art expertise. A history of funding executed for NPS research is shown at left.

IMPORTANT SPONSORED PROGRAM INFO

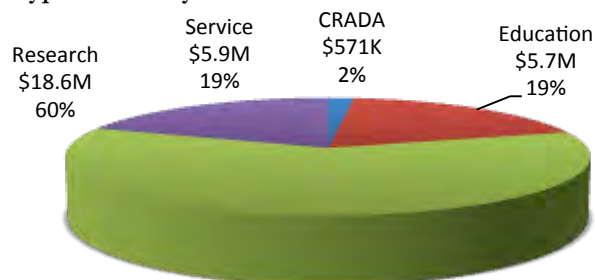
Sponsored Program Policy and Guidance Memos	Policy memos on many aspects of sponsored programs can be found at http://www.nps.edu/Research/rspa.html#PolicyGuidance . Subjects include: fiscal responsibilities of PI/PD, proposal routing form, who can be a PI/PD, proposal approval process, categories of sponsored activities, and more.
Proposal Guidelines	Guidelines for preparing proposal can be found at http://intranet.nps.edu/ResAdmin/prop_guide.pdf#general
Proposal Budget Templates	FY13 Proposal Budget Templates and guidelines can be found at http://intranet.nps.edu/ResAdmin/FY13/prop_budg_page.html
Proposal Routing Form	A Proposal Routing Form is required documentation with each proposal. The form is on line at http://intranet.nps.edu/ResAdmin/prop_route_form.html
Use of Human Subjects in Research	Complete guidance on the NPS Human Research Protection Program is on line at http://www.nps.edu/Research/IRB.htm
Export Control	Export control information can be found at http://www.nps.edu/Research/ExportControl/index.html
Research Safety	NPS Research Safety Office information is on line at http://intranet.nps.edu/ResAdmin/Safety/
Annual Training	Principal Investigators/Project Directors are required to complete annual accountability training each fiscal year. Modules are online at: https://www.nps.edu/Technology/WebBasedTraining/Auth/modules/Research/index.asp

SPONSORED PROGRAMS STATUS, NOVEMBER 2012

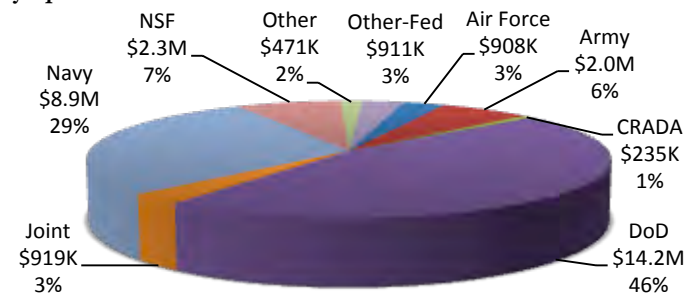
NEW FUNDS AVAILABLE: \$30.8M*

(* No Carryover Funds included)

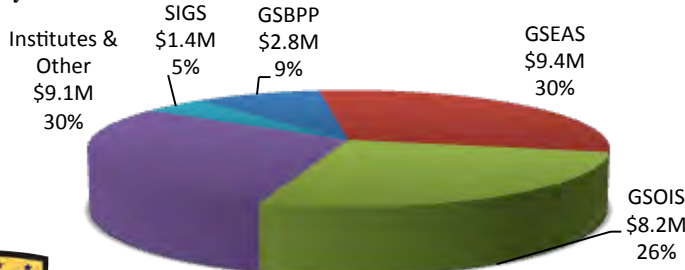
By Type of Activity



By Sponsor



By School

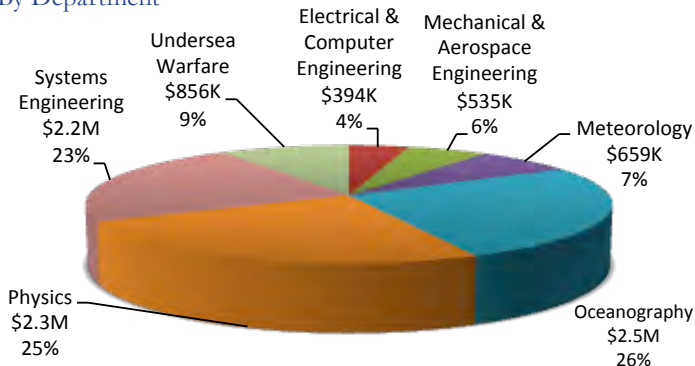


Graduate School of Engineering and Applied Sciences

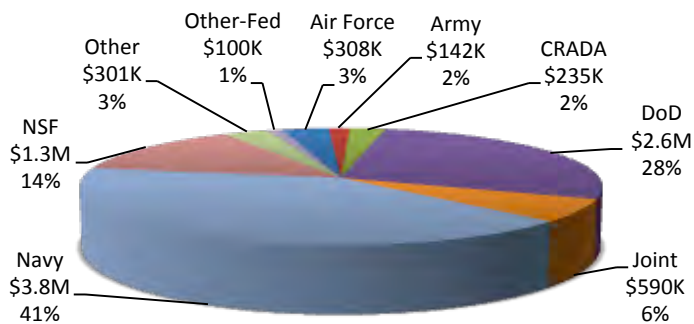
New funds available: \$9.4M*

(* No Carryover Funds included)

By Department



By Sponsor



Projects funded in November:

- Railgun Charger Design, *Alex Julian*, EC (ONR)
- Source Identification and Shielding, *Michael Morgan*, EC (ONR)
- Magnetic Cloaking Investigation, *Michael Morgan*, EC (ONR)
- Gallium Nitride (HEMT) Reliability Analysis, *Todd Weatherford*, EC (AFRL)
- Shipboard Calibration Enhancements, *Xiaoping Yun*, EC (NSWC-Corona Division)
- Ground Vehicle Survivability Education and Research, *Christopher Adams*, MAE (DOT&E)
- Weapon Delivery Accuracy Support, *Morris Driels*, MAE (JTCG)
- Navigation/Guidance/Control for Spacecraft Autonomous Proximity Maneuvers, *Marcello Romano*, MAE (AFRL)
- GeoEye Slew Optimization, *I. Michael Ross*, MAE (GeoEye)
- Improved Radar Modeling and Environmental Integration for Accurate Electromagnetic Assessments, *Paul Frederickson*, MR (SPAWAR)
- Aircraft Measurements for Understanding Air-Sea Coupling and Improving Coupled Model Predictions, *Qing Wang*, MR (ONR)
- Aircraft Observation for Improved Physical Parameterization for Seasonal Prediction, *Qing Wang*, MR (ONR)
- Measurement and Analysis of Phenomenology and Statistics of Sound Propagation Over Sand Dunes on Upper Slope of the Northeastern South China Sea, *Ching-Sang Chiu*, OC (ONR)
- Characterizing Underwater Noise at the SOCAL Range Complex, *John Joseph*, OC (USPACFLT)
- Field and Numerical Study of the Columbia River Mouth, *Jamie MacMahan*, OC (ONR)
- Advanced Research on Transport of Hydrocarbon in the Environment, *Jamie MacMahan*, OC (University of Miami)
- Characterization of the Upper Slope Sand Dunes in the South China Sea and Their Impact on Acoustic Propagation, *Ben Reeder*, OC (ONR)
- Clutter Depth Discrimination in the Shallow Water Waveguide, *Ben Reeder*, OC (ONR)
- Acoustical Characterization of the Riverine Environment, *Ben Reeder*, OC (ONR)
- An Array of Autonomous Ocean Flux Buoys to Directly Observe Turbulent Vertical Fluxes of Heat, Salt and Momentum as a Component of the Arctic Observing, *Tim Stanton*, OC (NSF)
- Autonomous Ocean Flux & Wave Buoys for Use in the ONR Marginal Ice Zone, *Tim Stanton*, OC (ONR)
- Department of Energy and International FEL Scientific Collaboration, *William Colson*, PH (ONR)
- Coulomb Explosion of Metastable Clusters and Surfaces, *Joseph Hooper*, PH (ONR)
- Remote Sensing Support for Counter-IED Operations, *Chris Olsen*, PH (DIA)
- Resonance Ionization Mass Spectrometry for Post-Detonation Nuclear Forensics, *Craig Smith*, PH (DTRA)
- Analysis of 3-D Propagation Effects Due to Boundary and Volumetric Environmental Variability, *Kevin Smith*, PH (ONR)
- Integrating Human-Robot Team Interactions in Counter Swarm Scenarios Summit, *Tim Chung*, SE (Lockheed Martin)
- N9I Chair of Systems Engineering Analysis (SEA) Support-FY13, *James Eagle*, SE (CNO)
- Multidisciplinary Energy Studies Support for USMC Expeditionary Energy Office, *Alejandro Hernandez*, SE (USMC - MARCORSSCOM)
- Liaison on Marine Engineering and Other Technical Matters, *Cliff Whitcomb*, SE (ONR-Global)
- Assistance to Implementation of the PMA-261 Fleet Common Operating Environment, *Richard Millar*, SE (NAVAIR)
- SEM PD-21, *Walter Owen*, SE (Various)
- System of Systems Engineering and Integration for Space and Naval Warfare Systems, *Warren Vaneman*, SE (SPAWAR)
- Undersea Warfare Research Support, *Winford Ellis*, UW (CNO)
- NPS Chair of Undersea Warfare Program, *Winford Ellis*, UW (CNO)
- Undersea Warfare Curriculum Support, *Winford Ellis*, UW (CNO)
- NPS ASW Certificate Program, *Daphne Kapolka*, UW (CNO)

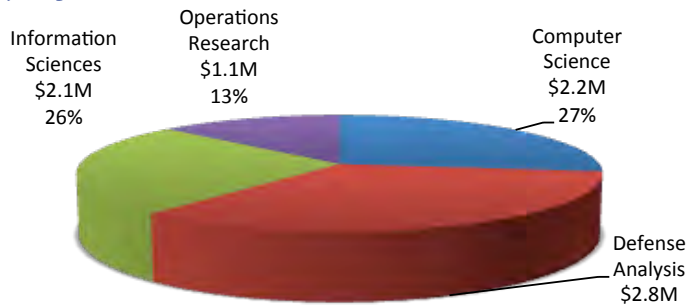
Please submit your faculty and research news (published articles, conference proceedings, conference presentations, books, honors received, accomplishments, milestones, etc.) to research@nps.edu.

Graduate School of Operational and Information Sciences

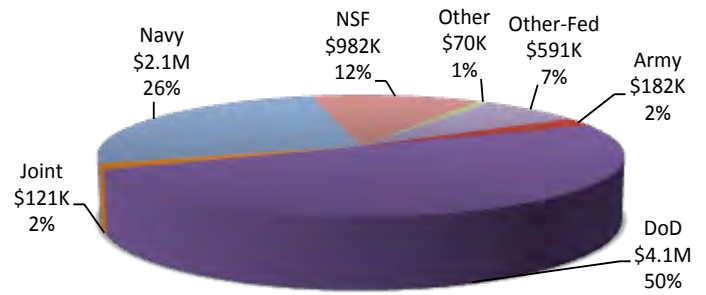
New funds available: \$8.2M*

(* No Carryover Funds included)

By Department



By Sponsor



Projects funded in November:

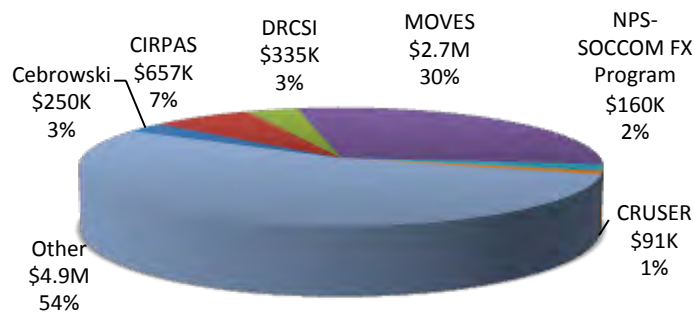
- DEEP FY13-FY14 RDTE, *Simson Garfinkel*, CS (DIA)
- On-Phone Multimodal Continuous, Active Authentication, *Craig Martell*, CS (NRO)
- A Reverse-Engineering Framework to Enable Digital Media Forensics, *J. Bret Michael*, CS (DIA)
- A New Application Download Model, *Dennis Volpano*, CS (ONR)
- Counter-Terrorism Archive Project, *Douglas Borer*, DA (Counter Terrorism Fellowship Program)
- NPS Program Support for the Staff of the Secretary of the Navy (FY13), *Dan Boger*, IS (SECNAV)
- MIO 2013 Field Experimentation: Networking and Interagency Collaboration on Maritime-Sourced Threat Detection and Interdiction, *Alex Bordetsky*, IS (ARL)
- Joint Integrated Innovation Environments (JIIE) Project, *Raymond Buettner*, IS (OSD)
- Trident Warrior FY13, *Shelley Gallup*, IS (U.S. Fleet Forces Command)
- AEA and Joint Electronic Attack and Compatibility Office Program, *Alan Jaeger*, IS (NAWC- Weapons Division)
- Multi-Source Intelligence Expertise, *Chris Olsen*, IS (NGIA)
- Next-Generation Network Science, *Dave Alderson*, OR (ONR)
- Optimization of Sensor Operation for Search, Surveillance, and Rapid Accurate Decision Making in Maritime, Littoral and Urban Environments, *Michael Atkinson*, OR (ONR)
- Development of Operational Planning Decision Aids for the Maritime Operations Center, *Gerald Brown*, OR (ONR)
- Large-Scale Optimization, *Gerald Brown*, OR (ONR)
- Military Applications of Optimization, *Matt Carlyle*, OR (ONR)
- Design of Experiments for Follow-On Operational Test of the AEGIS Modernization Program, *Patricia Jacobs*, OR (NAVSEA)
- Mission Command Analysis Using Monte Carlo Tree Search, *Kyle Lin*, OR (TRAC - Monterey)
- Optimal Surveillance Patrol With Extensions, *Kyle Lin*, OR (ONR)
- Masters of Systems Analysis Distance Learning Program, *Steven Pilnick*, OR (Various)

Research and Education Institutes, Centers, and Other

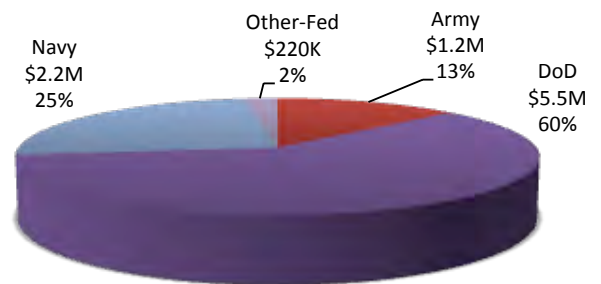
New funds available: \$9.1M*

(* No Carryover Funds included)

By Department



By Sponsor



Projects funded in November:

- Mission Command Analysis Using Monte Carlo Tree Search, *Arnold Buss*, MOVES (TRAC - Monterey)
- OSD Support for Military Training and Energy Infrastructure Compatibility and Mission Sustainment, *Joe Sullivan*, MOVES (OSD)
- Innovation Strategy and Technology Experimentation, *Joe Sullivan*, MOVES (ONR)
- Network Administration and Technical Support, *Joe Sullivan*, MOVES (TRAC - Monterey)
- Puma DDL COI, *Robert Bluth*, CIRPAS (NSWG4)
- NPS/CIRPAS Support of ONR Airborne Research Objectives, *Haflidi Jonsson*, CIRPAS (ONR)
- Counter Directed Energy Weapons (CDEW) Program at Naval Postgraduate School, *Sivaguru Sritbaran*, DRCSI (ONR)

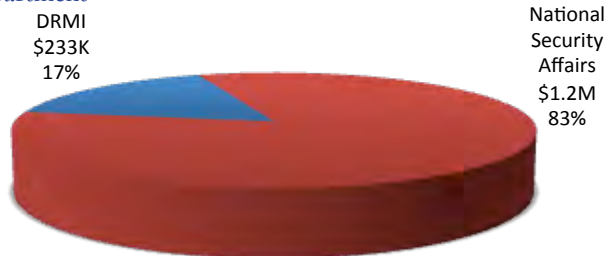
SPONSORED PROGRAM STATISTICS

School of International Graduate Studies

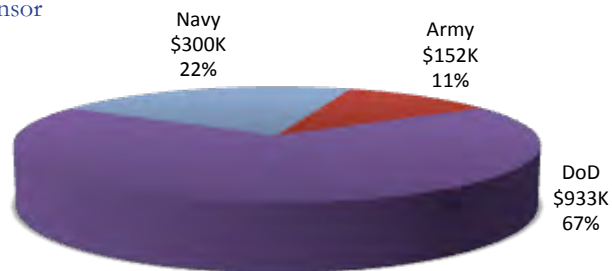
New funds available: \$1.4M*

(* No Carryover Funds included)

By Department



By Sponsor



Project funded in November:

- Military Transformation and the Rise of Brazil, *Harold Trinkunas*, NS (USARO)
- Nathan Leites and China. A Sourcebook of Research by Leites and Some Applications, *Mie-Sophia Augier*, DRMI, (OSD)

Graduate School of Business and Public Policy

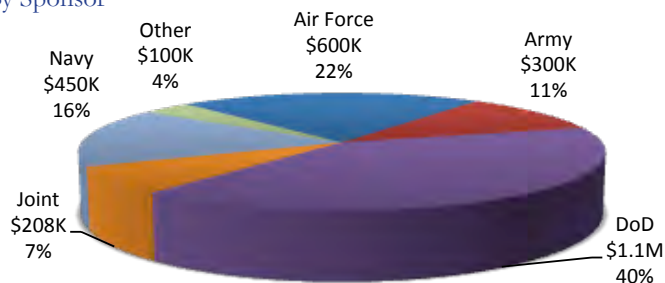
New funds available: \$2.8M*

(* No Carryover Funds included)

Projects funded in November:

- Cost Management Certificate Course, *William Gates*, GSBPP (ASA (FM&C))
- Civilian Executive MBA Program 808 Cohort Model, *William Hatch*, GSBPP (OASN)
- PEO IWS - Acquisition Research Program Support, *Keith Snider*, GSBPP (PEO IWS)
- OUSD-Air Force FY13 Sponsored Acquisition Research, *Keith Snider*, GSBPP (SAF/AQXR)
- OUSD (AT&L): FY13 Sponsored Acquisition Research, *Keith Snider*, GSBPP (OUSD)

By Sponsor



STEM STUDENT INTERNS AT NPS

NPS is excited to have several new avenues, as well as proven programs, to support our research faculty with STEM summer interns.

Through the hard work of MAE Chair **Knox Millsaps**, NPS is now a participating lab with ONR's successful Naval Research Enterprise Internship Program (NREIP) involving undergraduate and graduate students. For more information visit <http://www.onr.navy.mil/Education-Outreach/undergraduate-graduate/NREIP-naval-internship.aspx>.

NPS is also qualified to be a lab for the Science and Engineering Apprentice Program (SEAP) that provides high-achieving high school students a chance to work alongside faculty and military students on research projects. More information is available at <http://www.onr.navy.mil/Education-Outreach/K-12-Programs/SEAP.aspx>.

The deadline to participate in NREIP and SEAP is fast approaching. Applications for both interested faculty and students need to be filed by Monday, January 7. Faculty and students with any questions can send inquiries to nreip@nps.edu

Midshipmen from the US Naval Academy have interned at NPS over the years. Organizing and spreading the word about this opportunity is now consolidated with **Alison Kerr** at the Cebrowski Institute.

Community college students studying STEM disciplines have a pathway to summer internships through our six year partner-

ship with Hartnell College in Salinas. Please contact Alison Kerr at adkerr@nps.edu.



NPS Hartnell 2011 Internship Students Kelsey Tanksley and Claudia Garcia assist Albert Barreto with preparing server system boards for the Cloud Computing and Applied Security Laboratories.

“OVERCLOCK MY SATELLITE”

This November, Research Assistant Professor **Mark Karpenko** had a “feature article” published in the *IEEE Spectrum Magazine*. The article (co-authored with Nazareth Bedrossian and Sagar Bhatt of The Charles Stark Draper Laboratory) is titled “Overclock my Satellite,” and describes some of the groundbreaking work that the NPS Control and Optimization Laboratories completed on NASA’s TRACE space telescope (see photograph below). The article is currently available online at <http://spectrum.ieee.org/aerospace/satellites/overclock-my-satellite> and appears in the November 2012 print edition of the magazine.



Photograph of the TRACE spacecraft undergoing pre-launch checkout at NASA.

The overall theme of the work was to demonstrate that the Control and Optimization Laboratories now has the technology available to design and implement shortest-time space maneuvers for a variety of satellite missions. These maneuvers help both the military and science communities in maneuvering satellite sensors to areas of interest as quickly as possible in order to collect the maximum amount of intel-

ligence or other data. As such, these maneuvers are of interest to new and existing science missions like the SWIFT spacecraft or the James Webb Space Telescope. Commercial spacecraft can also benefit from this technology.

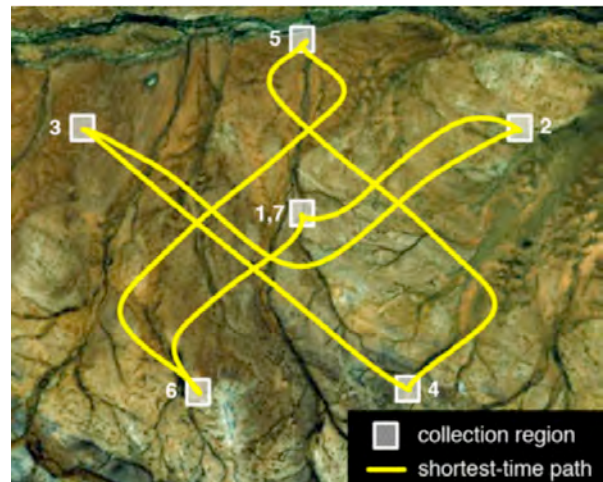
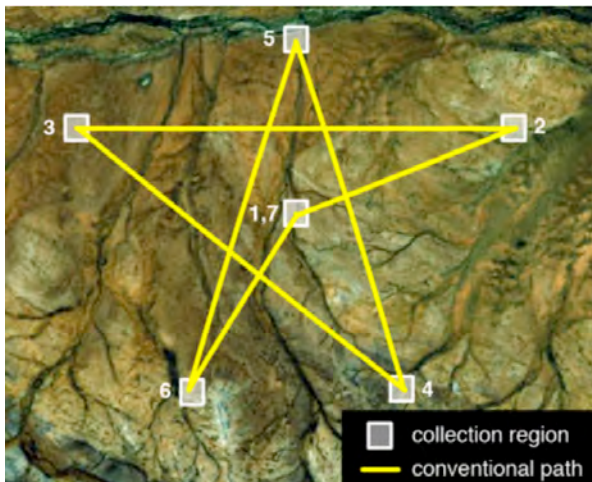
The interesting aspect of the new maneuvers demonstrated by Karpenko, who led the team of TRACE experimenters from NPS, Draper Lab and NASA’s Goddard Space Flight Center, is their “strange” appearance in comparison with the conventional approach. This is illustrated in the images below, which show the

path of the spacecraft’s sensor as the spacecraft is rotated between various data collection regions. The image on the left shows the conventional approach in which all of the points of interest are connected by straight-line paths. The image on the right shows the flight results for the new maneuver technology developed by the Control and Optimization Laboratories. Using the new approach, the spacecraft sensor now traces out a unique curve between each of the imaging points. The total distance that the imaging sensor travels is longer using the new approach, but the spacecraft can traverse the unique paths more rapidly so that more points can be visited in a given interval. This apparent contradiction to intuition is made possible by exploiting the spacecraft’s nonlinear attitude dynamics (inherent to every satellite system) that are normally avoided in conventional maneuvering.

Dr. Karpenko, along with Dr. **I.M. Ross**, Mechanical and Aerospace Engineering and personnel from Draper, were part of the first group ever to demonstrate this concept on an orbiting satellite and received the prestigious NASA Group Achievement Award for their effort. They recently presented the following technical paper about this technology titled “Flight Results for a Revolutionary Approach to Maximizing Spacecraft Imaging Capability.” The paper was presented at the 23rd International Symposium of Space Flight Dynamics (ISSFD) hosted this past October by the NASA Jet Propulsion Laboratory, and is available online at https://issfd.jpl.nasa.gov/home/assets/papers/ISSFD23_AD_2.pdf. Ross and Karpenko also published a research paper titled, “A Review of Pseudospectral Optimal Control: From Theory to Flight,” which reviews key theoretical results in pseudospectral optimal control (originally developed by Ross and Dr. **F. Fahroo**, Applied Mathematics) that were critical for the success of the TRACE flight tests. The article appears in the December 2012 issue of Annual Reviews in Control, a journal of the International Federation of Automatic Control (IFAC).

Although the experiments on TRACE showed that changing the way maneuvers are performed can increase the capability of a satellite system by saving precious time, these same ideas can also be used by design engineers to help reduce the size and energy requirements of new satellite attitude control systems. Moreover, this can be done

...continued on page 8



Flight results from emulated imaging experiments conducted on TRACE: Using the conventional maneuvering approach (left), all collection regions are connected by slower straight-line paths. The approach developed by the Control and Optimization Laboratories (right) provides a unique “high-speed” maneuver path so that more points can be visited in a given timeframe.

APPLIED MATHEMATICS

Carr, L. E., III, Borges, C. F., & Giraldo, F. X. (2012). An element-based spectrally optimized approximate inverse preconditioner for the euler equations. *Journal on Scientific Computing*, 34(4), B392-B420.

Kang, W., & Xu, L. (2012). Optimal placement of mobile sensors for data assimilations. *Tellus Series A-Dynamic Meteorology and Oceanography*, 64, 17133.

Kelly, J. F., & Giraldo, F. X. (2012). Continuous and discontinuous galerkin methods for a scalable three-dimensional nonhydrostatic atmospheric model: Limited-area mode. *Journal of Computational Physics*, 231(24), 7988-8008.

Kilic, E., & **Stanica, P.** (2013). The inverse of banded matrices. *Journal of Computational and Applied Mathematics*, 237(1), 126-135.

Martin, J., **Wilcox, L. C.**, Burstedde, C., & Ghattas, O. (2012). A stochastic newton mcmc method for large-scale statistical inverse problems with application to seismic inversion. *Journal on Scientific Computing*, 34(3), A1460-A1487.

Mueller, A., Behrens, J., **Giraldo, F.X.**, Wirth, V. "Comparison between adaptive and uniform discontinuous Galerkin simulations in dry 2D bubble experiments." *Journal of Computational Physics*. (accepted)

CEBROWSKI INSTITUTE

Denning, P. J., & Bell, T. (2012). The information paradox classical information theory has no room for meaning-but humans persist in assigning meaning. how can we reconcile this difference? *American Scientist*, 100(6), 470-477.

Denning, P. J. (2012). Don't feel bad if you can't predict the future. *Communications of the ACM*, 55(9), 30-32.

CENTER FOR INTERDISCIPLINARY REMOTELY-PILOTED AIRCRAFT STUDIES (CIRPAS)

Wonaschuetz, A., Sorooshian, A., Ervens, B., Chuang, P. Y., Feingold, G., Murphy, S. M., de Gouw, J., Warneke, C., & **Jonsson, H. H.** (2012). Aerosol and gas re-distribution by shallow cumulus clouds: An investigation using airborne measurements. *Journal of Geophysical Research-Atmospheres*, 117, D17202.

Coggon, M. M., Sorooshian, A., Wang, Z., Metcalf, A. R., Frossard, A. A., Lin, J. J., Craven, J. S., Nenes, A., **Jonsson, H. H.**, et. al. (2012). Ship impacts on the marine atmosphere: Insights into the contribution of shipping emissions to the properties of marine aerosol and clouds. *Atmospheric Chemistry and Physics*, 12(18), 8439-8458.

COMPUTER SCIENCE

Drusinsky, D. (2012). Behavioral and temporal pattern detection within financial data with hidden information. *Journal of Universal Computer Science*, 18(14), 1950-1966.

Rowe, N., & Garfinkel, S. (2012). In Filiol E. E.,R. (Ed.), *Finding suspicious activity on computer systems*

DEFENSE RESOURCES MANAGEMENT

INSTITUTE

Amara, J. 2012. Demographic Changes in the VHA Veteran Population Following OEF/OIF. *Peace Science, Peace Economics and Public Policy*. (In press.)

Hendricks, A., **Amara, J.**, Baker, E., Charns, M., Gardner, J., Kimmerling, R., Krengel, M., Meterko, M., Pogoda, T., Stolzmann, K., Wolfsfeld, L. & Lew, H. 2012. Screening for mild traumatic brain injury in OEF-OIF deployed military: An empirical assessment of the VHA experience. In press. *Brain Injury*.

Amara, J. 2012. Implications of military stabilization efforts on economic development and security: The case of Iraq. *Journal of Development Economics*. doi:10.1016/j.jdeveco.2012.02.001.

Assistant Professor **Laura Arme**y presented a paper 9 Nov. at a defence economics conference on military expenditures and civil war at the University of Ottawa. The paper, titled, "The cost of crisis: The impact of civil wars on defense expenditures" was sponsored by Armed Forces Canada.

Assistant Professor **Cameron MacKenzie**, Associate Professor **Eva Regnier**, and Assistant Professor **Jay Simon** attended the Institute for Operations Research and the Management Sciences (INFORMS) Annual Meeting 14-17 Oct. 14-17 in Phoenix, AZ. They gave several research presentations: "Disruption Management during Supply Chain Disruptions" (MacKenzie), "Optimal Resource Allocation for Preparedness and Recovery of Interdependent Systems" (MacKenzie), "Uncertainty Model for Rapid Updating of Target Positions" Regnier), "Estimating Costs of Self-Sustaining Logistics Networks" (Regnier and Simon), and "Probability Segmenting: Managing Uncertainty in Military Drafts" (Simon and Associate Professor Jonathan Lipow). In addition, Dr. MacKenzie received the Judith Liebman Moving Spirit Award for his work in leading the University of Oklahoma INFORMS student chapter, and Dr. Simon served as a panelist at the INFORMS Future Academician Colloquium.

Professor **Ryan Sullivan's** paper, "The Effect of Cigarette Taxation on Prices: An Empirical Examination Using Local-level Data" has been selected by the Editorial Board of Public Finance Review as the winner of the "Outstanding Paper Award" for papers published in 2012.

Associate Professor **Natalie Webb** presented her research titled, "Do patriotic nonprofit organizations waste resources?" and "Including Special Kids: A case study in resource dependency and stewardship with alignment of expertise and goals" at the Asso-

NPS RESEARCH INFORMATION

- The quarterly *Compilation of Thesis Abstracts* is available at <http://www.npsedu/research/MoreThesisAbst.html>
- Past editions of "Research News" are available at <http://www.nps.edu/research/Newsletters.html>
- The *Annual Summary of Faculty Research* is available at <http://www.nps.edu/research/SummaryRes.html>
- The Faculty Expertise Directory is available at <http://faculty.nps.edu/vitae/cgi-bin/vita.cgi>

ciation for Nonprofit Organizations and Voluntary Action annual meeting on 17 Nov.

ELECTRICAL AND COMPUTER ENGINEERING

Butler, J. T., & Sasao, T. (2012). Hardware index to permutation converter. *2012 IEEE 26th International Parallel and Distributed Processing Symposium Workshops & PhD Forum (IPDPSW)*, 431-436.

GLOBAL PUBLIC POLICY ACADEMIC GROUP

Augier, M., Guo, J., & McNab, R.M. 2012. The new economic togetherness: Economic warfare and some implications for security and the military profession. In Stouffer, J. & Lindsay D. (Eds.). *Threats to the military profession: International perspectives*. Kingston, Ontario: Canadian Defense Academy Press, 123-146.

GRADUATE SCHOOL OF BUSINESS AND PUBLIC POLICY

Halpern, B. H., & **Snider, K. F.** (2012). Products that kill and corporate social responsibility: The case of US defense firms. *Armed Forces & Society*, 38(4), 604-624.

Pema, E. & Mehay, S. (2012). Career effects of occupation-related vocational education: Evidence from the military's internal labor market. *Economics of Education Review*, 31(5), 680-693.

Rendon, R. G., Huynh, T. V., & Osmundson, J. S. (2012). Contracting processes and structures for systems-of-systems acquisition. *Systems Engineering*, 15(4), 471-482.

MECHANICAL AND AEROSPACE ENGINEERING

Boseman, M. F., Kwon, Y. W., Loup, D. C., & Rasmussen, E. A. (2012). Interface fracture of hybrid joint of glass-/steel-fiber composite. *Engineering Computations*, 29(5-6), 504-527.

Luhrs, C., Kane, M., Leseman, Z., & Phillips, J. (2012). Novel Process for Solid State Reduction of Metal Oxides and Hydroxides. *Metallurgical and Materials Transactions B*. doi:10.1007/s11663-012-9756-x

METEOROLOGY

Bell, M. M., Montgomery, M. T., & Emanuel, K. A. (2012). Air-sea enthalpy and momentum exchange at major hurricane wind speeds observed during CBLAST. *Journal of the Atmospheric Sciences*, 69(11), 3197-3222.

Smith, R. K., & **Montgomery, M. T.** (2012). Observations of the convective environment in developing and non-developing tropical disturbances. *Quarterly Journal of the Royal Meteorological Society*, 138(668), 1721-1739.

NATIONAL SECURITY AFFAIRS

Ear, S. (2012). "Swine flu: Mexico's handling of A/H1N1 in comparative perspective," *Politics and the Life Sciences*, 31(1),

Ear, S. (2012). "International donors and human rights in Cambodia," *East Asia Forum: Economics, Politics and Public Policy in East Asia and the Pacific*.

Ear, S. & Burgos, S. "Cambodia: The Challenge of Adding Value to

Agriculture after Conflict" Chapter 8 in an edited volume entitled *Challenging Post-Conflict Environments: Sustainable Agriculture* (Ashgate), October 2012.

OCEANOGRAPHY

Fiorentino, L. A., Olascoaga, M. J., Reniers, A., Feng, Z., Beron-Vera, F. J., & **MacMahan, J. H.** (2012). Using lagrangian coherent structures to understand coastal water quality. *Continental Shelf Research*, 47, 145-149.

MacMahan, J., Reniers, A., Ashley, W., & Thornton, E. (2012). Frequency-wavenumber velocity spectra, Taylor's hypothesis, and length scales in a natural gravel bed river. *Water Resources Research*, 48, W09548.

Maslowski, W., Kinney, J. C., Higgins, M., & Roberts, A. (2012). The future of arctic sea ice. *Annual Review of Earth and Planetary Sciences*, Vol 40, 40, 625-654.

Udovychenkov, I. A., Brown, M. G., Duda, T. F., Mercer, J. A., Andrew, R. K., Worcester, P. F., Dzieciuch, M. A., Howe, B. M., & **Colosi, J. A.** (2012). Modal analysis of the range evolution of broadband wavefields in the north pacific ocean: Low mode numbers. *Journal of the Acoustical Society of America*, 131(6), 4409-4427.

OPERATIONS RESEARCH

Atkinson, M. P., Kress, M., & Szechtman, R. (2012). Carrots, sticks and fog during insurgencies. *Mathematical Social Sciences*, 64(3), 203-213.

Dimitrov, N. B., & Jordanov, V. T. (2012). Probability density function transformation using seeded localized averaging. *IEEE Transactions on Nuclear Science*, 59(4), 1300-1308.

PHYSICS

Datskos, P. G., Lavrik, N. V., Hunter, S. R., Rajic, S., & **Grbovic, D.** (2012). Infrared imaging using arrays of SiO₂ micromechanical detectors. *Optics Letters*, 37(19), 3966-3968.

Phillips, D. J., Blaine, K. E., Cirignano, L. J., Ciampi, G., & Hae-gel, N. M. (2012). Cathodoluminescence and spatial variation in mobility-lifetime ($\mu\tau$) product in bulk doped thallium bromide. *IEEE Transactions on Nuclear Science*, 59(5), 2608-2613.

Smith, K. B. (2012). Field transformational approach to three-dimensional scattering from two-dimensional rough surfaces. *Journal of the Acoustical Society of America*, 131(6), EL441-EL447.

SYSTEMS ENGINEERING

Warren Vaneman presented a paper entitled, "Addressing Navy's Information Dominance Warfare through System of Systems Engineering and integration," at the NDIA Systems Engineering Conference, San Diego, CA, in October. This paper represented Dr. Vaneman's initial research defining a process for SPAWAR to implement Information Technology Technical Authority (IT TA) for the Navy. His System of Systems Engineering and Integration (SoSE&I) research continues throughout FY13. An October 2012 letter from the CNO and ASN RDA tasks SPAWAR to achieve IT TA Initial Operating Capability (IOC) by 1 October 2013.

COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENT (CRADA)

Title: Integrating Human-Robot Team Interactions in Counter Swarm Scenarios Summit

Partner: Lockheed Martin Corporation Acting By and Through Advanced Technologies Laboratories

PI: Assistant Professor Timothy Chung, Systems Engineering

Summary: This collaboration will lay the groundwork for the creation of a prototype system combining in the capabilities of Supervisor of Unmanned Mission Management by Interactive Teams (SUMMIT) and Research Environment for Supervisory Control of Heterogeneous Unmanned Vehicles (RESCHU). The goal is to be able to demonstrate how workload can be balanced across a naval watch team using the Lockheed Martin ATL's SUMMIT systems in a Littoral Combat Ship (LCS) based mission involving unmanned vehicles. This initial effort is limited to the integration work; prototype testing is expected to be conducted in a follow-on effort.

Title: Cyber Security and Emergency Preparedness Studies

Partner: The City of San Diego

PI: Alan Jaeger, Center for Asymmetric Warfare

Summary: The Naval Postgraduate School and the City of San Diego will conduct research to increase preparedness relating to cyber

security challenges. The current processes for cyber attack detection and response capabilities for the City of San Diego will be evaluated. Collaborators will research, design, and execute a program that will result in the development of a regional Cybersecurity Plan, to become an Annex to the San Diego County Emergency Operations Plan.

MEMORANDUM OF AGREEMENT

Title: Support for the Office of Naval Research Visiting Chair Professor at the Naval Postgraduate School

Partner: Chief of Naval Research

PI: Jeff Paduan, Vice President and Dean of Research

Incumbent: TBD

Summary: The purpose of this MOA is to establish a Visiting Chair Professorship at the Naval Postgraduate School (NPS) sponsored by the Office of Naval Research (ONR). The establishment of a Chair will provide a direct relationship between ONR and NPS by placing a federal visiting researcher at NPS to expand research collaboration opportunities between NPS and other Navy and Marine Corps Laboratories and Warfare Centers in order to meet the current and emergent needs of the Naval Forces

INSTITUTIONAL REVIEW BOARD

Dr. Larry Shattuck will begin his tenure as chair of the NPS Institutional Review Board (IRB). Dr. Shattuck is the Director of Human Systems Integration Program in the department of Operations Research. Dr. Shattuck has served as an interim IRB Chair in 2010 and as a member of the IRB for several years. We are very pleased to have Professor Shattuck as part of IRB.

IRB Board Members currently include:

- **Dr. Larry Shattuck**, Operations Research (Chair)
- **Dr. Maiah Jaskoski**, National Security Affairs (Vice Chair)
- **Dr. Mark Eitelberg**, Graduate School of Business & Public Policy
- **Dr. Ken Euske**, Graduate School of Business & Public Policy
- **Dr. Simson Garfinkel**, Computer Science
- **Ms. Sue Hutchins**, Information Sciences
- **Dr. Quinn Kennedy**, Operations Research
- **Dr. Victoria Clement**, National Security Affairs
- **CPT Bridgett Bell, USA**, Operations Research (Student Rep.)
- **LCDR William Riley, USN**, Command Chaplain (Outside Rep., Non-scientist)
- **MAJ Jason Caldwell, USA**, TRAC Monterey (Outside Rep.)

Support for the IRB is provided by **Rikki Panis** and **Celine Lai** in the Research and Sponsored Programs Office. Additional information on the use of human subjects in research can be found at: <http://www.nps.edu/research/IRB.htm>

SATELLITE, *continued from page 5*

while meeting or exceeding specifications on maneuver speed. By implementing the idea, more space is made available for crucial sensing and communications payloads. As part of Karpenko's current research in this direction, he has been working with NPS students to prototype next generation attitude control hardware and software in order to get the most benefit out of the new maneuver design technology. One of Dr. Karpenko's recent M.Sc. students, **LT Kerri Ackman, USN**, has developed a prototype control moment gyroscope that will be used to evaluate the impact of integrating the new maneuver design technology into attitude control systems for agile spacecraft. Meanwhile, thesis students **MAJ Steven Crews, USA**, **LT Reid Smythe, USN**, and **CDR Jeff King, USN**, are currently working on how to generalize various aspects of the concept so that it can be easily integrated to control any given satellite system. The research group is also looking for follow on students in areas ranging from mechanical design and simulation to new electronics and software development and testing to help mature this technology. Karpenko noted, "This is a very exciting time for the Control and Optimization Laboratories and we are very thrilled at the direction the technology is heading!"



LT Kerri Ackman working on the control moment gyroscope she designed and built as part of her recent M.Sc. thesis. This hardware will be used to evaluate new attitude control systems for agile spacecraft.