



**Calhoun: The NPS Institutional Archive**  
**DSpace Repository**

---

NPS Scholarship

Publications

---

1995-10

## NPS Research / 1995-10

Naval Postgraduate School, Monterey California

---

<https://hdl.handle.net/10945/52900>

---

This publication is a work of the U.S. Government as defined in Title 17, United States Code, Section 101. Copyright protection is not available for this work in the United States.

*Downloaded from NPS Archive: Calhoun*



Calhoun is the Naval Postgraduate School's public access digital repository for research materials and institutional publications created by the NPS community. Calhoun is named for Professor of Mathematics Guy K. Calhoun, NPS's first appointed -- and published -- scholarly author.

**Dudley Knox Library / Naval Postgraduate School**  
**411 Dyer Road / 1 University Circle**  
**Monterey, California USA 93943**

<http://www.nps.edu/library>

# RESEARCH

Volume 5, Number 2

October 1995



**FROM THE DEAN**  
by Paul Marto, Dean of Research

NPS is a unique educational institution with a mission to enhance the security of the United States of America through graduate and professional education programs that are sustained by research and advanced studies directed toward the needs of the Navy and DoD. Research, therefore, is an essential ingredient of our graduate-level curricular programs, and we must strive to make research even stronger in the years ahead.

But we are all aware that competition for the shrinking R&D dollar is steadily increasing, so how can we foster NPS excellence in research in an era of dramatic cuts in DoN/DoD budgets? One important way is to be more creative in pursuing new sources of reimbursable research support and in fostering collaborative arrangements with other government laboratories, with other universities, and with private industry. In short, we must develop a strong technology transfer program that markets NPS research capabilities to the fullest.

Technology transfer means different things to different people. The Federal Technology Transfer Act of 1986 provides for making federal laboratory developments accessible to private industry and to state and local governments. The momentum associated with this initiative has grown throughout government, academia, and industry so that today the United States has the National Technology and the Federal Laboratory Consortium (FLC)—which now totals more than 600 R&D laboratories and centers—with a mission to promote the rapid movement of federal technology R&D into the mainstream of the US economy, and more than 200 universities engaged in some level of technology licensing. In fact, intellectual property rights and technology licensing have become an essential component of university resources. In 1993, for example, universities issued more than 2000 licenses to companies, an increase of 70 percent over 1991.

What does all this activity mean for NPS? How can we, a DoD graduate university engaged in research, posture ourselves to benefit from this entrepreneurial climate? In my judgment, the primary purpose of technology transfer

-- continued on page 4

**IN THIS ISSUE**

From the Dean	1
Technology Transfer	2
Conference Activity at NPS	5
Faculty News	6
CRADA Information	10
NRC Program	11
NRA&D Research Fellowships	15
Research Directories	16

**NPS RESEARCH**

is published by the Dean of Research in accordance with NAVSO P-35. Views and opinions expressed are not necessarily those of the Department of the Navy.



**NAVAL POSTGRADUATE SCHOOL**

- Superintendent  
RADM Marsha J. Evans
- Provost  
Dr. Richard Elmer
- Dean of Research  
Dr. Paul Marto
- Director of Technology Transfer  
Dr. F. Kevin Owen

## THE TECHNOLOGY TRANSFER PROGRAM AT NPS

In July 1995 the Naval Postgraduate School has initiated a technology transfer and commercialization plan which will involve interactions between faculty, senior administrators, and the NPS Foundation to provide an environment conducive to the development and organization of collaborative and consortia technology transfer initiatives. These initiatives will assist in identifying and securing funding to help advance research and development and national security programs at the School.

The aim of the plan is to stimulate the transition of the School's research and development to a dual-use technology investment effort which will provide the most advanced and affordable military systems and the most competitive commercial products. To ensure success, ONR support in key areas is essential.

### Approach

All elements of the plan will have common requirements, including specified minimum partnership and participation levels, cost sharing, and defense relevance consistent with the School's mission to serve the advanced educational needs of the Navy. It will be designed to help innovators, entrepreneurs, and developers of new technologies to bring new ideas to the market place.

### Key Elements of the Plan

The plan will be designed to provide incentives and rewards to encourage faculty participation and all cooperative agreements will be structured to protect the School's and the taxpayers' data and proprietary rights. The agreements will require significant partner commitment with realistic scope consistent with the School's in-house support and priorities. The School will seek industrial and other partners to help advance dual-use applications and commercialization of the School's research. These partners must have the interest, resources, and technical expertise to incorporate the technology into products and services intended for sale. The School will also make available faculty consultant and expert services, facilities, equipment, and other services to assist in the development of dual-use and commercial products that have been brought to the attention of the School by external partners.

### The Start-Up Process

The Research Office will work directly with the academic and research support staff and students, legal staff, and senior administration to conduct technology audits across the faculty and academic groups to assess the commercial potential of current in-house technologies. Formal presentations, small group and one-on-one meetings at the School will be held to inform the faculty and staff of the program details and to encourage their active support and participation. This is a crucial element of the plan as it will be doomed to failure without their involvement. Concurrently, contacts with potential outside partners, local and national business groups and consortia will be initiated. Announcements will be prepared for publication in *Commerce Business Daily* and a **home page for Internet** will be made available **on World Wide Web**. All inquiries and responses will be followed up and extensive canvassing of industry at regional and national levels will be aggressively pursued.



**DR. F. KEVIN OWEN**  
**Director of Technology Transfer**

Dr. F. Kevin Owen comes to NPS from private industry, where he was internationally known for his innovative research and development in fluid mechanics and energy systems. He has published numerous papers related to transatmospheric vehicle technology and the aerodynamics and aerothermodynamics of high-speed commercial and military aircraft and missiles. He has lectured extensively on his research throughout the United States and Europe and was an invited AGARD guest lecturer at the von Karman Institute in 1988. He has received national and international recognition and two NASA achievement awards for his research.

After earning a BSC and MSC from the University of Wales and the PhD degree from the University

-- continued on page 3

-- continued on page 3

## TECHNOLOGY TRANSFER, *continued from page 2*

### Initial Agreements

Initially there will be two general categories of cooperative agreements between the School and industry partners: agreements with industry to develop and commercialize the School's existing technology and agreements which enable industry to develop their innovations with facilities and research support supplied by the School.

For example, to structure a collaborative agreement, candidate R&D already being pursued by the School to meet a Navy approved mission will be identified. With this technology in hand, potential industrial partners will be sought. A match will be made when the School and the company agree to cosponsor a specific project in clearly defined stages from concept to full-scale production. At that point, the Research Office, with the support of the legal staff, will negotiate an agreement between all the parties concerned. The contractual agreement will detail the work to be undertaken by the parties involved, the personnel and equipment that the School and the partner will contribute to the project, the intellectual property rights, and the associated costs. Maintaining a private portion of cost sharing will be an important issue. All programs will require private sector partners to bear some portion of the cost of the School's contributions. This provision will be designed to ensure that all participants have a vested interest in the project's outcome.

Initially, the agreements will be modelled on the lines of existing CRADAs and on other forms of cooperative agreements. Standard CRADAs will be used whenever possible to facilitate the execution of the agreements. Each agreement will reflect the School's basic technology transfer policy, commercial values, and support for ATD flagship programs. Each cooperative agreement will require incorporation of technology transfer plans and commercial technology acquisition objectives. Clearly defined plans for the commercialization of the technologies to be developed will also be required.

### Selection Criteria

Potential partners will be evaluated and selected based on the strengths of their in-house capabilities, business and commercial plans, and their value to the enhancement of the School's mission and department balance. Initially, proposals will be evaluated by an ad hoc faculty review board chaired by the School's Director of Technology Transfer. Selected proposals, based on faculty recommendations and ratings, will be submitted for final approval by the Dean of Research. Standard CRADAs will be signed off locally by the School's Superintendent, other agreements will be forwarded to ONR for approval and signature. All agreements must be comprehensive legal documents which detail the responsibilities, risks, and rewards of all parties involved.

### Future Partnership Options

Alternate forms of agreement that add flexibility to the technology transfer plan will be investigated as viable compliments to CRADAs. They could include the following options:

**Memorandum of Understanding (MOU)** is a statement of policy,

**DR. OWEN**, *continued from page 2*  
of Oxford, Dr. Owen continued his research as a National Research Council Associate at NASA Ames and as a Senior Research Engineer at United Technologies Research Center. In 1976 he founded Complere Inc., where he managed research programs and established a proven record of financial sponsorship from the public and private sectors. Dr. Owen is a founding member of the biennial International Symposium on Turbulent Shear Flows and the AIAA Aerodynamic Measurements Technical Committees and currently serves on the IEEE Instrumentation in Aerospace Simulation Panel and the AIAA Ground Testing Technical Committee.

At the Naval Postgraduate School, Dr. Owen will be responsible for the formulation, implementation, and continual improvement of technology transfer plans which utilize the School's faculty research and development programs to make the most efficient contribution to our strategic and economic security. Working with faculty, senior administrators, and the NPS Foundation, he will provide leadership in developing and organizing collaborative research initiatives with partners in the public and private sectors. He will also assist in identifying and securing funding for such initiatives and help advance research and public service programs that enhance the Nation's commercial development and quality of life. □

-- continued on page 4

## TECHNOLOGY TRANSFER

### TECHNOLOGY TRANSFER, *continued from page 3*

practice, or intention of concern to both parties. No funds or transfer of goods or services are involved and it is not legally binding. MOUs could provide a straightforward means of cooperating with a potential CRADA partner during the preliminary investigative phase.

**Nonreimbursable agreements** are collaborative R&D efforts involving contributions of personnel, facilities, expertise, equipment, or technology. There are no financial obligations, although data and proprietary rights agreements may be included.

**Reimbursable agreements** will require payment for private use of NPS facilities, personnel, expertise, or equipment. Data and proprietary rights agreements will be negotiated and included in these agreements.

**Joint sponsored research agreements (JSRAs)** will allow for the sharing of resources to advance the NPS mission and goals and transfer resulting technology to the private sector. A reasonable amount of up-front cash or in-kind contribution will be required from the industrial partner.

Finally, **cost-shared contracts** will provide goods and services to NPS for a negotiated proportion of the School's reasonable, allocable, and allowable costs.

These alternatives will be considered when appropriate as preludes to CRADAs.

### Continual Plan Development and Improvement

Research diversification consistent with the School's mission will be encouraged. Diversification by definition involves establishing links with outside organizations. The richer and more varied these relationships, the greater the number of opportunities for new agreements that will suggest themselves. Continuing relationships will involve the transfer of technology generated by the School to external users, making facilities available to industry at cost, subcontracting research tasks, and collaborating with industry on subjects of mutual interest, as well as the temporary exchange of faculty, research and technical staff. Judicious mixing of the School's exchanges of personnel and equipment with industry, subcontracting, consultant services, and publishing summaries of joint work in progress will help create a favorable climate for research collaboration and joint ventures. Industrial barriers which prevent the School from taking the broadest view of its mission will be reviewed in the light of the provisions of reinvention. Drafting a liberal policy of permitting work for others, bringing in scientists and engineers from industry for active and technical assistance, and improving conditions for cooperative work will help remove the obstacles to joint ventures.

A permanent **faculty advisory board** will be established to help identify and prioritize potential dual-use technologies and partners while also providing proposal evaluations and ratings. This will help ensure continued faculty participation and interest in the program. Outside experts will also be invited to participate. Regular dialogue and meetings with faculty, staff, and students to promote technology transfer ideas and awareness will continue.

The **Director of Technology Transfer** will be responsible for monitoring contract performance, costs, and schedules, as well as alerting the parties to any problems and potential solutions. Assistance with patent, proprietary and licensing rights and applications will be provided through the **legal office**.

The School's technology transfer activities will be coordinated and managed through an electronic network which

*-- continued on page 5*

---

### THE DEAN'S COLUMN, *-- continued from page 1*

at NPS is to market our research capabilities, to promote existing technologies that may have nondefense applications in the private sector and to seek partnerships, both nationally and locally around Monterey Bay, by which we can strengthen our financial base and our reputation for quality work. The Secretary of Defense recently stated that "domestic technology transfer and dual-use technology development are integral elements of the Department's pursuit of its national security mission."

The time is right for NPS to embrace this program. Let us explore new partnerships, innovative funding sources, and the development of our own technology licensing program. The rewards for the School and the faculty can be substantial, and in the long term we will enhance our educational effectiveness. □

## TECHNOLOGY TRANSFER/CONFERENCES

### TECHNOLOGY TRANSFER, *continued from page 4*

will be designed to link all the technology commercialization team members with each other and the rest of the country through **Internet**. News bulletins will feature highlights of the School's R&D and technology transfer programs. Periodic *Commerce Business Daily* and other appropriate announcements will be prepared and exhibits will be initiated along with presentations at workshops and conferences.

### New Emphasis on Forming Business Partnerships

There will be a major new emphasis on the formation of business partnerships. They will include dual-use development partnerships, industry-led partnerships, and commercial technology acquisition. The School will actively pursue partnerships and alliances with state, regional, and local governments, as well as institutions for commercial development and technology transfer opportunities. These aspects of the program will be of particular relevance to the Monterey Bay area, which is being affected by the closure of Fort Ord, but which has world-class science, language, and marine institutes. The new California State University campus, which is part of the Defense and Commerce departments' largest national base conversion project, will provide an additional local forum for joint ventures.

The potential for collaboration of Monterey Bay region science and technology organizations, both with each other and with industry, could become a magnet to attract technology based industries and research institutes to the region.

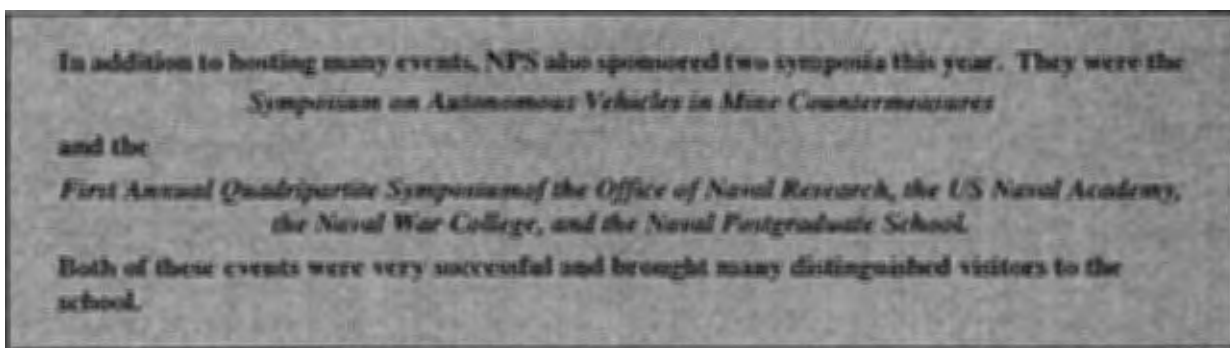
NPS has recently signed an MOU with the University of California at Santa Cruz to develop local consortium agreements which will stimulate multi-institutional centers for science, technology, education, and policy which would draw upon regional resources.

These unique local factors will help provide the School with excellent opportunities to contribute to the national technology transfer program.

### CONFERENCE ACTIVITY AT NPS

NPS hosts 35-40 conferences, symposia, and workshops each year. Conference facilities at NPS are competitive with local offerings and one step ahead as we have the uniqueness of being able to host "classified" conferences.

Facilities available for conferences include King Hall, Ingersoll-122, Glasgow-102 and 103, Spanagel-101A, and the Engineers' Auditorium. Classrooms are also available for break-out rooms.



Support for arranging facilities, audiovisual support, set-up, etc., are available from the Conference Coordinator in the Research Office. A brochure, as well as conference guidelines, are also available by calling extension 2426.

Conferences hosted during FY95 include:

5th ARPA Symposium on Photonic Systems for Antenna Applications

AIAA 1995 C4I Issues and Answers Conference

Advanced Technology Expendable and Dispenser Systems Program Review

11th Annual Review of Progress in Applied Computational Electromagnetics

6th US Army Tank Automotive Command Annual Combat Vehicle Survivability Symposium

Upcoming conferences/meetings at NPS are included in the insert to this newsletter.

## FACULTY NEWS

### AA

Members of the Navy-NASA Joint Institute published the following papers during the period 1 March to 30 June 1995:

**J.A. Ekaterinaris, R.L. Coutley, L.B. Schiff, and M.F. Platzer**, "Numerical Investigation of High Incidence Flow Over a Double-Delta Wing," *Journal of Aircraft*, Vol. 32, No. 3, pp. 457-463, May-June 1995.

**J.A. Ekaterinaris, M.S. Chandrasekhara, and M.F. Platzer**, "Analysis of Low Reynolds Number Airfoil Flows," *Journal of Aircraft*, Vol. 32, No. 3, pp. 625-630, May-June 1995.

**S.K. Hebbar, M.F. Platzer, and W.D. Frink, Jr.**, "Effect of Leading-Edge Extension Fences on the Vortex Wake of an F/A-18 Model," *Journal of Aircraft*, Vol. 32, No. 3, pp. 680-682, May-June 1995.

**J.A. Ekaterinaris and L.B. Schiff**, "Navier-Stokes Solutions for an Oscillating Double-Delta Wing," *Journal of Aircraft*, Vol. 32, No. 2, pp. 228-234, March-April 1995.

**J.A. Ekaterinaris**, "Analysis of Flowfields Over Missile Configurations at Subsonic Speeds," *Journal of Spacecraft and Rockets*, Vol. 32, No. 3, pp. 385-391, May-June 1995.

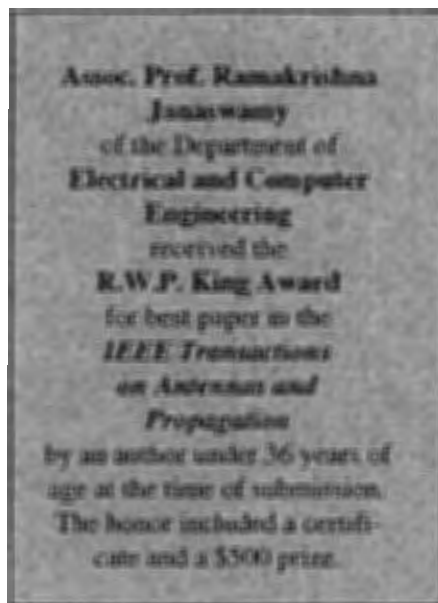
**E.J. Gutmark, K.H. Yu, R.D. vanDyken, I.H. Tuncer, and B.G. McLachlan**, "Experimental and Computational Study of a Close-Coupled Canard-Wing Configuration at High Angle-of-Attack," AIAA-95-1863, presented at the 13th AIAA Applied Aerodynamics Conference, San Diego, 19-22 June 1995.

**M.S. Chandrasekhara, L.W. Carr, and M.C. Wilder**, "Unsteady

Aspects of Compressible Dynamic Stall Flow at Very Low Pitch Rates," *Proceedings of the 6th Asian Congress of Fluid Mechanics*, Singapore, 22-26 May 1995, pp. 1528-1531.

**S.K. Hebbar, M.F. Platzer, and W. Dooley**, "Ground-Effect Studies on STOVL Aircraft in Hover," *Proceedings of the 6th Asian Congress of Fluid Mechanics*, Singapore, 22-26 May 1995, pp. 194-197.

**S.K. Hebbar, M.F. Platzer, E.H. Smith, and M.E. Salazar**, "High Angle-of-Attack Wind-Tunnel Investigation of a Multimission Vehicle," *Journal of Spacecraft and Rockets*, Vol. 32, No. 4, 1995, pp. 734-736.



### MA

**Professors W. Gragg and C. Borges**, together with **Ruggero Frezza**, wrote the paper "Some Inverse Eigenproblems for Jacobi and Arrow Matrices," to be published in the *Journal of Numerical Linear Algebra Applications*.

**Prof. W. Gragg and Martin H. Gutknecht** coauthored the paper "Stable Look-Ahead Versions of the Euclidean and Chebyshev Algorithms" to appear in the Proceedings of the Walter Gautschi 65th Birthday Conference, held at Purdue University, Lafayette, IN, in December 1994.

**Professors B. Neta and D.A. Danielson's** article "Comparison of Orbit Propagators in the Research and Development Goddard Trajectory Orbit Determination System. Part I: Simulated Data" was accepted for presentation at the AAS/AIAA Astroynamics Conference in Halifax, Nova Scotia, and will appear in the Proceedings as paper number AAS 95-431.

**Prof. B. Neta and NRC Associate F.X. Giraldo** coauthored "Finite Element Approximation of Large Air Pollution Problems I: Advection," published as NPS Technical Report NPS-MA-95-005.

### ME

**Distinguished Professor T. Sarpkaya** presented an invited paper entitled "Quandaries of the Creation, Convection, and Confusion of Vorticity," at the International Meeting on Vortex Element Methods in Albuquerque, NM, on 25 March 1995.

On 14 April 1995 he gave an invited seminar at the California Institute of Technology on "Intellectual and Technological Challenges of Vortex Breakdown."

He chaired two sessions and presented the following three papers at the International Conference on

-- continued on page 7

## FACULTY NEWS

Offshore Mechanics and Arctic Engineering, held in Copenhagen, Denmark, on 18-23 June 1995:

- "Oscillating Flow About Two- and Three-Dimensional Bilge Keels,"
- "Hydrodynamic Damping, Flow-Induced Oscillations, and Biharmonic Response," and
- "DNS and LES Simulation of Oscillating Flow About Cylinders."

These papers have been published in the proceedings of the conference and will appear in the *Journal of Fluids Engineering*.

**Assoc. Prof. Chuck Calvano**, of Total Ship Systems Engineering, will be working with the Air Force Electronic Systems Center at Hanscom Air Force Base, MA. In conjunction with Lincoln Laboratories, the Center is developing a Dual Band Transportable Radar System, which will undergo a sea-based evaluation. The evaluation will require the redesign and modification of two ships, and Prof. Calvano will use his Total Ship Systems Engineering background and expertise in ship design to evaluate the design plans. His involvement will also encourage Total Ship Systems Engineering students to explore appropriate engineering issues associated with the project.

**Prof. A.J. Healey** has been appointed Executive Chairman for the IEEE Symposium on Autonomous Underwater Vehicle Technology, AUV '96, to be held in Monterey, CA, 3-6 June 1996. He has also been appointed to a special committee reporting to **ADM Pearson** (COMINELWARCOM), to assist in defining new technology that could be included in the Phase III (1999)

Joint Service Advanced Concept Technology Demonstration for Very Shallow Water/Surf Zone Mine Countermeasures. In addition, he is the Guest Editor of the *IEEE Journal of Oceanic Engineering* October 1995 issue.

### MR

The Department of Meteorology hosted an **Independent Model Review Panel (CIMREP)** for the Commander, Naval Meteorology and Oceanography Command, on 22-24 March 1995.

**Prof. R. Haney** chaired the meeting and **Prof. K. Davidson** participated as member of the CIMREP. The purpose of the review was to technically evaluate the Radio-Physics-Optics (RPO) model and to make recommendations relative to its inclusion in the Ocean Atmosphere Mission Library (OAML). RPO is a computer-based model developed by NRaD, San Diego, for operational assessment of radar/radio performance in the marine atmospheric boundary layer.

**Professors K. Davidson** and **C. Wash** presented papers at the 10-14 July 1995 International Geosciences and Remote Sensing Symposium, IGARSS'95, held in Florence, Italy. Both papers report on applications of study results in the fields of satellite radar and radiometric sensors and properties of the marine atmospheric boundary layer.

**Prof. K. Davidson** presented a paper and participated in deliberations at the 18-20 July 1995

Electromagnetic Workshop, cosponsored by ODDR&E, SPAWAR, and NAVSEA, and hosted by Johns Hopkins University, Applied Physics Laboratory, Laurel, MD. The workshop provided a forum to present and compare tropospheric EM propagation models and the means to provide the required environmental inputs, emphasizing military tactical applications. **Prof. Davidson** reported results of his and **Prof. C. Wash's** studies on Shipboard and Satellite Sensing of Coastal Refractive Conditions.

**Dr. Guest** and **Prof. Davidson** of MR and **Dr. Glendenning** of NRL coauthored a journal paper on arctic air-sea-ice interaction, called "An Observational and Numerical Study of Wind Stress Variations Within Marginal Ice Zone," *Journal of Geophysical Research*, 100, 10,887-10,904, June 1995.

**Prof. Davidson** became a member of the Science Committee designing a multi-year experiment on Electro-Optical Properties and Coastal Environment (EOPACE). This multi-group effort by ONR to formulate models and observational methods to characterize the optical wave propagation in the coastal marine atmospheric boundary layer, will begin off the West Coast in FY96 and will extend through FY99.

### PH

**Assoc. Prof. Anthony Atchley's** research on thermoacoustics and sonoluminescence has been discussed in recent articles in *Physics Today*, *Science News*, and *21st Century Science and Technology*

-- continued on page 8



## FACULTY NEWS

magazines. He and **Jerry Lentz** coauthored a paper entitled "Mie Scattering From a Sonoluminescing Air Bubble in Water," published in *Applied Optics*. The cover photo for that issue of *AO* featured their research.

**Assoc. Prof. Steve Baker** presented a paper entitled "Bistatic Scattering of Underwater Sound From a Porous Solid Sphere: A Comparison of Theory and Experiment."

**Assoc. Prof. Dave Cleary, Assoc. Prof. Scott Davis, and J. Hicks** coauthored the paper "A New Technique for Measuring Atomic Oxygen in the Thermosphere," which was presented at the American Geophysical Union Spring Meeting in May 1995 in Baltimore, MD.

**Assoc. Prof. Cleary** published the paper "The Middle Ultraviolet Dayglow Spectrum" in the June 1995 issue of the *Journal of Geophysical Research*.

**Prof. Bill Colson** is a panel member for the DoE review of CEBAF Laser Processing Consortium's proposal for an industrial free electron laser.

**Sr. Lecturer S. Gnanalingam** coauthored a paper entitled "The Middle Ultraviolet Dayglow Spectrum," published in the *Journal of Geophysical Research*.

**Asst. Prof. Robert Keolian** and his PhD student **LCDR Daphne Kapolka** are working on a novel method of active self-noise

cancellation for the sonar of the new attack submarine, work funded by NAVSEA. He is also working on whether it is possible for the AN/SQR-19 towed array to be modified with nonlinear elements so that it may receive modulated waveforms from the AN/SQS-53C hull array, even though the two arrays normally work in separate nonoverlapping frequency bands. This work is funded by NSWC.

**Asst. Prof. Jim Luscombe** has established a CRADA with Texas Instruments.

**Assoc. Prof. Bill Maier** is pursuing interests in the proliferation of nuclear weapons among terrorist groups and underdeveloped nations.

**Asst. Prof. Kevin Smith** presented a talk at the 129th Meeting of the Acoustical Society of America in Washington, DC, on three-dimensional underwater acoustic propagation and the effects of azimuthal coupling on bottom reverberation. He continues to maintain and upgrade the University of Miami Parabolic Equation (UMPE) acoustic propagation model.

**Sr. Lecturer Don Spiel** published the paper "On the Births of Jet Drops From Bubbles Bursting on Water Surfaces" in the 15 March 1995 issue of the *Journal of Geophysical Research*. This paper presents the results of the measurement of the parameters of the births of jet drops in both sea and fresh waters.

SM  
*Journal Articles*

Norman F. Schneidewind,

"Controlling and Predicting the Quality of Space Shuttle Software Using Metrics," *Software Quality Journal*, 4, 1995, pp. 49-68.

**B. Gavish and S. Sridhar**, "Economic Aspects of Configuring Cellular Networks," *Wireless Networks*, 1(1), 1995, pp. 115-128.

**L.R. Jones**, "Public Financial Management Curriculum Design," *Budget & Finance*, Winter 1995.

**Aaron Wildavsky and L.R. Jones**, "Budgetary Control in a Decentralized System: Meeting the Criteria for Fiscal Stability in the European Union," *Public Budgeting and Finance*, 14/4, 1995.

**Paolo Urio and L.R. Jones**, "Public Finance Issues and Problems in Switzerland," *Public Budgeting and Finance*, 14/4, 1995.

**L.R. Jones**, "Leaders in the Field: Aaron Wildavsky: A Man and Scholar for All Seasons," *Public Administration Review*, 55/1 (January/February) 1995.

**Jim Suchan**, "The Influence of Organizational Metaphors on Writers' Communication Roles and Stylistic Choices," *The Journal of Business Communication*, 32/1, 1995, pp. 7-29.

**Nancy C. Roberts and Kristen Ann Dotterway**, "The Vincennes Incident: Another Player on the Stage?" *Defense Analysis*, Vol. 11, No. 1, 1995, pp.31-45.

**B. Ramesh, K. Stubbs, J. Power, and M. Edwards**, "Lessons Learned From Implementing Requirements Traceability," *Crosstalk: The Journal of Defense Software Engineering*, April 1995, pp. 11-16.

**K. Sengupta**, "Cognitive Feedback in Environments Characterized by Irrelevant Information," *OMEGA: International Journal of*

-- continued on page 9

## FACULTY NEWS

*Management Science*, 23, 1995, pp. 125-143.

**K. Sengupta, D. Te'eni, N. Melone, M. Limayem, and S. Weisband**, "Views of Work, and the Design and Use of Group Support Systems," *Accounting, Management, and Information Technology*, 4, 1994, pp. 245-266.

### Conference Papers

**Ted Keller, Norman F. Schneidewind, and Patti A. Thornton**, "Predictions for Increasing Confidence in the Reliability of the Space Shuttle Flight Software," *Proceedings of the AIAA Computing in Aerospace 10*, San Antonio, TX, 28 March 1995.

**B. Ramesh, C. Shibbs, T. Powers, and M. Edwards**, "Implementing Requirements Traceability: A Case Study," *Proceedings of the IEEE International Symposium on Requirements Engineering*, York, UK, 26-29 March 1995.

**B. Ramesh, G. Devries, D. Dwiggins, and M. Edwards**, "Towards Models and Mechanism for Requirement Traceability," *Proceedings of the IEEE International Symposium on Complex Computer-Based Systems*, Tucson, AZ, 6-9 March 1995.

**B. Gavish and S. Sridhar**, "Models for Configuring Cellular Networks with Mobility," *Proceedings of the Third International Conference on Telecommunication Systems*, Nashville, TN, 16-19 March 1995.

**Norman F. Schneidewind**, "Statistical Methods for Controlling and Predicting the Quality of Software," *Proceedings of the Santa Clara Valley Section of the American Society for Quality Control*, Santa Clara, CA, 4-6 April 1995.

**H.G. Bhargava, R. Krishnan, and R. Mueller**, "On Generalized Access to Globally Distributed Decision Technologies," *INFORMS National Meeting*, Los Angeles, CA, 23-26 April 1995.

**Greg Hildebrandt**, "Resource Implications of Joint Force Packages," 63rd Military Operations Research Society Symposium, Annapolis, MD, 7 June 1995.

**Norman F. Schneidewind**, "A Fine-Grained Analytic Ethernet Performance Model," *TIMS XXXIII Conference*, Singapore, 26 June 1995.

**Norman F. Schneidewind**, "Nonparametric Statistical Methods for Controlling and Predicting the Quality of Space Shuttle Flight Software," *TIMS XXXIII Conference*, Singapore, 26 June 1995.

### Other SM Department Research News

**Adjunct Professors Katchan Terasawa and Keebom Kang's** proposal to USAREC on *Bonus Incentive Recruiting Model (BIRM)* was approved by the US Army Recruiting Command (USAREC).

**Adjunct Prof. Keebom Kang** has been selected by the Institute of Industrial Engineering to serve as the Director of its Operations Research Division.

**Asst. Prof. B. Ramesh** is among the 25 faculty members selected nationwide to participate in Carnegie Mellon University Software Engineering Institute's faculty development program on software process improvement. The program is intended to help faculty members teach practitioners and students process improvement methods, such as the SEI Capability Maturity Model, that measures the ability of

organizations and individuals to develop and maintain software systems. These methods are being widely adopted in DoD in evaluating DoD and contractor organizations involved in system development.

**Assoc. Prof. Gail Fann Thomas** has been appointed to the Executive Board of the Association for Business Communication.

**Asst. Prof. Kishore Sengupta's** project *Multimedia-Based Intelligent Tutoring Systems for Training in Night Vision Goggles*, which is now in its third year, is being funded by the Naval Air Systems Command. The project envisions building a multimedia system that will enable aviators to learn critical perceptual skills required for the effective use of night vision goggles. The system is being developed in Authorware, with additional software for animation in 3D-Studio. Moreover, an intelligent tutor will be developed that will counsel students on errors and misconceptions. In the next stage of the project, synthetic environments, as well as detailed test and evaluation mechanisms will be incorporated.

**Asst. Prof. Sengupta's** project *Building Flexible, Adaptive Organizations for Command and Control*, a four-year project funded by the Office of Naval Research, will examine the key principles underlying the construction of flexible, adaptive organizations. The participants in the project are NPS, the University of Connecticut, and Alphatech, Inc. In attempting to answer the question of how such organizations can be built and sustained, a multimethod approach that combines modeling, experimentation, and field studies will be employed. □

## CRADA INFORMATION

### COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS

Federal technology transfer legislation has been passed by Congress for the purpose of facilitating the transfer of technology expertise, processes, systems, and capabilities from federal laboratories to the private sector. The intent is to enhance the competitive position of the United States in world markets. The Cooperative Research and Development Agreement (CRADA), authorized by the legislation, is the vehicle through which a federal laboratory interacts with other partners, including private industry, in pursuit of this goal.

A CRADA is a legal agreement which permits the federal partner to contribute personnel, facilities, and equipment in support of the project defined by the agreement. A private sector partner may contribute personnel, facilities, equipment, and funds to the project. A CRADA is *not* a procurement contract. The Federal Acquisition Regulations (FAR) and the DoD FAR Supplement are *not* applicable to CRADAs. CRADAs are not competed, nor are they subjected to any peer review process, but various partnership opportunities are considered by NPS before selecting a partner and negotiating an agreement. All Navy CRADAs must be reviewed and approved by the Office of Naval Research (ONR).

At the Naval Postgraduate School, opportunities for teaming with private industry are normally identified by NPS faculty through their professional contacts and activities. Initial discussions between the faculty member and his or her industrial counterpart should focus on the benefits of a CRADA to each of the partners, definition of the work to be undertaken, the time schedule, and the resources which each partner will contribute. Once this has been accomplished, the information is used by the NPS Research Office to prepare a draft CRADA. The CRADA covers the rights and responsibilities of the partners in the area of intellectual property, including patents and copyrights, as well as protection of proprietary information.

**A CRADA is a legal agreement which permits the federal partner to contribute personnel, facilities, and equipment in support of the project defined by the agreement. A private sector partner may contribute personnel, facilities, equipment, and funds to the project.**

The process by which a CRADA is approved is straightforward. The draft CRADA is first reviewed by the NPS faculty member and his or her industrial counterpart. When they are satisfied with the technical details of the agreement, the CRADA should be reviewed by the private sector's contracts/legal office. If the Navy Standard CRADA format is acceptable to the non-Navy partner, the NPS has local signature authority. If deviations from the standard format are requested, then the CRADA must be sent to the Office of Naval Research, where it is reviewed. Further negotiations between legal staff for ONR and the private partner may occur at this point. When final agreement has been reached, the Chief of Naval Research will authorize the Superintendent, NPS, to sign the agreement for the Navy. When both parties have signed, work may begin. Our experience suggests that the entire process, from the time a CRADA is first conceived until the time it is signed, may take anywhere from two to six months depending on the complexity of the intellectual property issues, how vigorously the parties pursue the agreement, and whether or not the agreement must be reviewed by ONR.

Since 1992, the Naval Postgraduate School has executed CRADAs with Martin Marietta, General Electric, Pacific Bell, Duralcan-USA, Digital Equipment, the NPS Foundation, and Mission Research Corp. Several other agreements are at various stages of negotiations. These agreements have generally involved NPS faculty and support personnel pursuing cooperative research with their industrial counterparts, NPS faculty expertise being applied to problems of concern to the private partner, and NPS-developed technology being moved toward commercial application.

Further information about CRADAs involving NPS can be obtained by contacting **Professor F. Kevin Owen**, Director of Technology Transfer, at the NPS Research Office, (408) 656-2098.

## *NRC Program*

### **THE NATIONAL RESEARCH COUNCIL POST-DOCTORAL ASSOCIATESHIP PROGRAM**

#### **What is the NRC Post-Doc Program?**

The National Research Council administers a post-doctoral program at numerous locations in the United States. NPS is a host laboratory for the program. Post-Doctoral Associates from all over the world may apply for an associateship award with NPS.

#### **How do Associates apply?**

Candidates complete an application package (available from NRC or the Research Office) and submit it along with a proposal for research. Candidates must apply to a preapproved faculty advisor.

**The Naval Postgraduate School hosts 9-10 NRC Post-Doctoral Associates each year. Of the 74 Associates hosted by NPS since 1980, 11 have joined the faculty at NPS. There are currently 28 faculty advisors representing a broad spectrum of research opportunities at NPS.**

#### **What is a preapproved advisor?**

A preapproved advisor is a faculty member at NPS who has been approved by NPS and the National Research Council to advise NRC Post-Doctoral Associates.

#### **How does a faculty member become an advisor?**

A nomination package is available in the Research Office. The package should be completed and forwarded to the Dean of Research. After local approval, the package is forwarded to NRC for their consideration and approval. Advisors along with their "research opportunities" are listed in a booklet published annually by NRC.

#### **Current NPS faculty/staff who previously held NRC Post-Doctoral appointments at NPS include:**

**Mary Batteen - Oceanography**  
**Melinda Peng - Meteorology**  
**Beny Neta - Mathematics**  
**Richard Rosenthal - Operations Research**  
**Murali Tummala - Electrical and Computer Engineering**  
**Andres Larraza - Physics**  
**Ashok Gopinath - Mechanical Engineering**  
**Supachai Siryanone - Meteorology**

#### **When can Associates apply?**

NPS has two review periods. Deadlines for applications are 15 January and 15 August.

#### **How long can an Associate be at NPS?**

A Post-Doctoral Associate is initially given a one-year appointment, but this appointment is renewable for up to three years.

#### **Who pays for an Associate?**

The current policy is for the faculty advisor and NPS to share the cost of an Associate during the first year. Subsequent renewals are paid by the faculty advisor. Please note that when reimbursable funds available to the advisor are utilized to pay for an Associate, the Associate's work must be directly related to the sponsored research project.

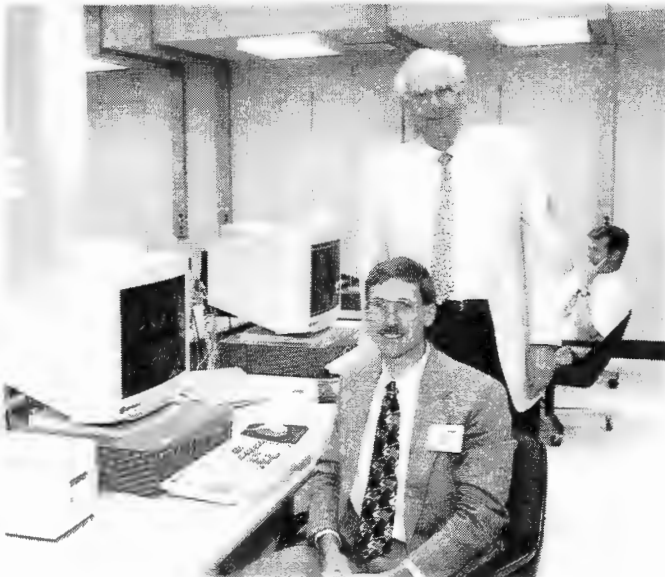
#### **More questions?**

Please call Danielle in the Research Office at extension 2099.

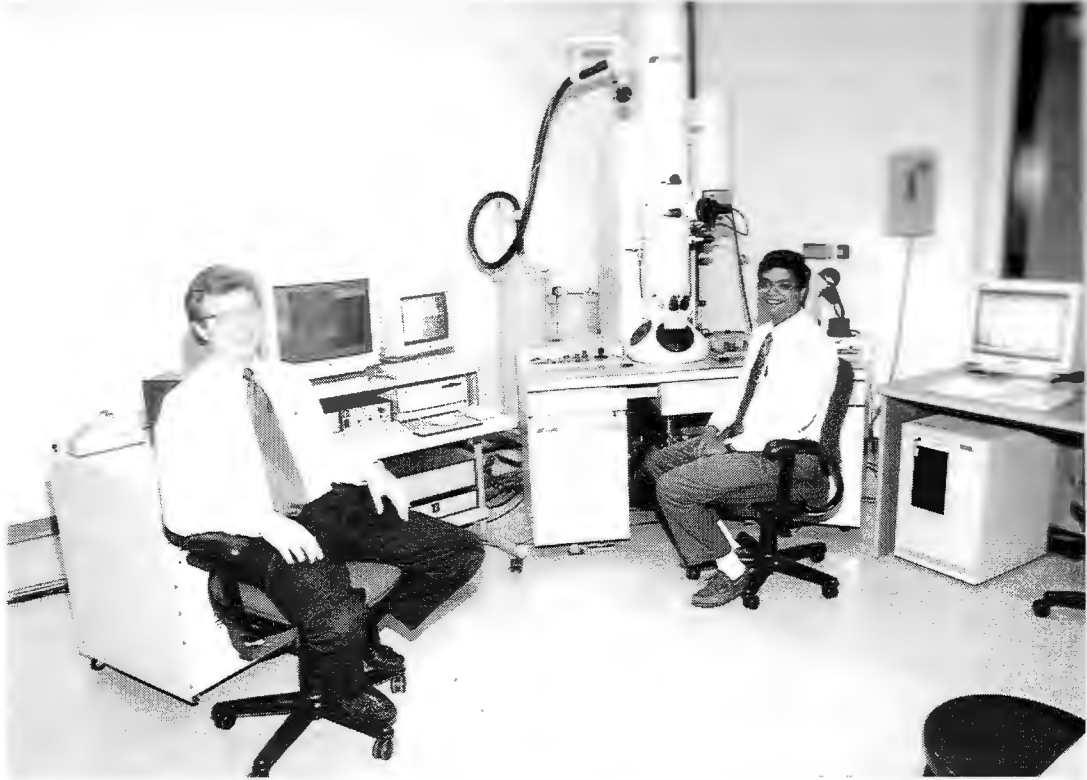
## NRC PROGRAM



*From left to right: Dr. Richard Harshman, NRC Program Administrator for NPS; Dr. Atul Kumar, Mechanical Engineering; Dr. Supachai Siryanone, Meteorology; Dr. Ilan Leib, Aeronautics/Astronautics; Dr. Kevin Jones, Aeronautics/Astronautics; Dr. Francis Giraldo, Mathematics; Asst. Prof. Ashok Gopinath, Mechanical Engineering; Dr. Ashok Das, former associate with Mechanical Engineering; Dr. John Meyer, Aeronautics/Astronautics; Dr. Tom Lippman, Oceanography; Dr. Arne Schwartz, Director of the Associateship Program from the National Research Council.*



*Dr. Kevin Jones (seated) with advisor Professor Max Platzer*



*Dr. Atul Kumar (right) with advisor Assoc. Professor Alan Fox*



*Dr. Thomas Lippman (left) with advisor Professor Edward Thornton*

## ***NRC PROGRAM***

### **ASSOCIATES PRESENT SEMINAR DURING NRC SITE VISIT**

The Program Administrator for NPS and the Director of the Associateship Program from the National Research Council made their annual site visit to NPS on 31 July 1995. As part of their visit, **Dr. Richard Harshman** and **Dr. Arne Schwartz** attended a half-day seminar presented by current and past NRC Post-Doctoral Associates. The program included presentations by:

**Dr. Kevin Jones**, Aeronautics/Astronautics

Advisor: **Professor Max Platzer**

Topic: A Computational Investigation of Aero Elasticity

**Dr. Tom Lippman**, Oceanography

Advisor: **Professor Ed Thornton**

Topic: Wave Transformation on Natural Beaches

**Dr. John Meyer**, Aeronautics/Astronautics

Advisor: **Professor Brij Agrawal**

Topic: Control Strategies for Spacecraft With Mixed Actuators

**Dr. Francis Giraldo**, Mathematics

Advisor: **Professor Beny Neta**

Topic: Parallel Semi-Lagrangian Finite Element Methods

**Dr. Ashok Gopinath**, Mechanical Engineering

(Dr. Gopinath is now an Associate Professor in the ME Department, but worked with **Professor Steven Garrett** while an NRC Post-Doc)

Topic: Heat Transfer in Thermo-Acoustic Refrigerators

**Dr. Atul Kumar**, Mechanical Engineering

Advisor: **Associate Professor Alan Fox**

Topic: Hot Corrosion of SiC Fiber Reinforced Glass Ceramic Composites

**Dr. Ilan Leib**, Aeronautics/Astronautics

Advisor: **Professor David Netzer**

Topic: Ignition of High Energetic Liquid Fuel

**Dr. Supachai Siryanone**, Meteorology

(Dr. Siryanone now works as a Research Assistant in Meteorology, but worked with **Associate Professor Wendell Nuss** while an NRC Post-Doc)

Topic: Multiquadric-Biharmonic Interpolation to Meteorological Data Analysis

## NRaD RESEARCH FELLOWSHIPS

### NPS STUDENTS WIN NRaD RESEARCH FELLOWSHIPS

The Naval Command, Control, and Ocean Surveillance Center RDT&E Division (NRaD), San Diego, recently announced and completed evaluations of proposals to the NRaD Fellowship Program. Fellowships are open to DoD officer personnel who are enrolled in a full-time graduate degree program at NPS or the Air Force Institute of Technology (AFIT). This program was initiated to promote NRaD partnerships with NPS and AFIT addressing NRaD research focus areas, lay the groundwork for future technical and project management assignments at NRaD, and foster long-term professional associations with NRaD technical personnel and management.

Five proposals were submitted by NPS students and four of them have been accepted. The fellowship carries with it a \$10,000 stipend which is to be used in support of the research project.

This year's recipients are:

**LCDR Suzanne Kruppa** for her research on *Modeling Quantum-Effect Semiconductor Devices*. LCDR Kruppa is enrolled in the Combat Systems curriculum and her faculty advisor is **Assistant Professor James Luscombe** in the Physics Department.

**LCDR Amy Smith** for her research on *Effect of Ocean Mesoscale Features on Adiabatic Mode Travel Times*. LCDR Smith's major is Engineering Acoustics and her faculty advisors are **Assistant Professor Kevin Smith** of the Physics Department and **Associate Professor Ching-Sang Chiu** of the Oceanography Department.

**LT Eugene Potente** for his research on *Vulnerabilities of FLT UHG Satellite Communication Systems and Its Application to Classic Crystal*. LT Potente is enrolled in the Systems Engineering curriculum and his faculty advisor is **Dr. Vincente Garcia** who is currently occupying the Chair of Signals Intelligence in the Department of Electrical and Computer Engineering.

**LT Douglas Jenik** for his research on *DAMA Vulnerability to Finger Printing*. LT Jenik is enrolled in the Electrical Engineering curriculum and his faculty advisor is also **Dr. Vincente Garcia**.

---

#### RESEARCH ADVISORY PANEL

Prof. Paul Marto - Dean of Research  
Assist. Prof. John Arquilla - National Security Affairs  
Prof. C.P. Chang - Meteorology  
Assoc. Prof. Ching-Sang Chiu - Oceanography  
(Academic Group Representative)  
Prof. Dan Dolk - Systems Management  
Prof. Patricia Jacobs - Operations Research  
Prof. Toke Jayachandran - Mathematics  
Assoc. Prof. Young Kwon - Mechanical Engineering  
Assoc. Prof. C. Thomas Wu - Computer Science  
LtCol Mark Youngren - Operations Research  
Prof. Max Platzer - Aeronautics/Astronautics  
(Faculty Council Representative)

#### ASSOCIATE CHAIRS FOR RESEARCH

Aeronautics and Astronautics - Professor Oscar Biblarz  
Computer Science - Associate Professor Neil Rowe  
Electrical & Computer Engineering. - Professor Jeffrey Knorr  
Mathematics - Professor Beny Neta  
Mechanical Engineering - Professor Young Shin  
Meteorology - Professor Kenneth Davidson  
National Security Affairs - Assistant Professor Jan Breemer  
Oceanography - Professor Edward Thornton  
Operations Research - Professor Robert Read  
Physics - Associate Professor Anthony Atchley  
Systems Management. - Associate Professor Mark Eitelberg



## RESEARCH DIRECTORIES

### RESEARCH OFFICE STAFF

**Danielle Kuska**

Research Programs Supervisor  
Code: 91 Phone: 2099  
Mail: DKuska (Banyan)  
research@nps.navy.mil (inet)

**Dolores Cruz**

Administrative Support Assistant to  
the Dean of Research  
Code: 91DC Phone: 2098  
Mail: DCruz (Banyan)

**Elaine Christian**

Research Activities Coordinator  
Code: 91EC Phone: 1124  
Mail: EChristian (Banyan)

**Carol Brumfield**

Conference Coordinator  
Code: 92CC Phone: 2426  
Mail: CBrumfield (Banyan)

**Tracy Snell**

Research Programs Assistant  
(Research Sponsors, Support Services  
Contract, Special Programs)  
Code: 91TS Phone: 2098  
Mail: TSnell (Banyan)

**Laura Ann Small**

Research Administration Assistant  
(Reimbursable Research & Instruction)  
Code: 91LS Phone: 2271  
Mail: LSmall (Banyan)

**Nenita Maniego**

Research Administration Assistant  
(Direct Funded Research)  
Code: 91NM Phone: 2273  
Mail: NManiego (Banyan)

**Fran Smith**

Research Administration Assistant  
(Research Publications/Technical  
Reports, Page Charges)  
Code: 91FS Phone: 2272  
Mail: FSmith (Banyan)

**Sandra Day**

Thesis Processor  
Code: 92SD Phone: 2762  
Mail: SDay (Banyan)

**Marietta "Dee" Henry**

Assistant Thesis Processor  
Code: 92MH Phone: 3050  
Mail: MHenry (Banyan)

**Beverly Ribelin**

Short Course Coordinator/  
Assistant Thesis Processor  
Code: 91BR Phone: 2984  
Mail: BRibelin (Banyan)

**Maclan "Mac" Cung**

Student Aide

### RESEARCH CENTERS

Center for Acquisition, Education, Training and Research (CAETR)

Associate Professor David Lamm, Director

Center for Civil Military Relations

Professor James Blandin, Director

Center for Information and Policy Analysis

Associate Professor George Thomas, Director

Center for Joint Services Electronic Warfare Simulation & Modeling

Assistant Professor Phillip Pace, Director

Center for Material Sciences and Engineering

Associate Professor Alan Fox, Director

Center for Northeast Asian Security Studies (Japan/Korea)

Professor Edward Olsen, Director

Center for Signal Processing

Professor Charles Therrien, Director

Center for Visual Science and Advanced Display

LT William Krebs, Director

Coastal Ocean-Acoustic Center

Associate Professor Ching-Sang Chiu, Director

Decision and Information Systems Center

Assistant Professor Hemant Bhargava, Director

Eurasian Security Center

Associate Professor Mikhail Tsympkin, Director

Institute for Joint Warfare Analysis

Professor Michael Sovereign, Director

Joint Center for International and Security Studies (JCISS)

Associate Professor Jan Breemer, Director

Military Economic Strategy Center for ASIA (MESCA)

Associate Professor Katchan Teresawa, Director

Navy-NASA Joint Institute of Aeronautics

Professor Max Platzer, Director

Software Metrics Center

Professor Norm Schneidewind, Director

Survivability and Lethality Assessment Center (SLAC)

Professor Robert Ball, Director

Unmanned Air Vehicle Technologies Research Center

Associate Professor Richard Howard, Director

Vertical Flight Technology Center

Professor E. Robert Wood, Director

Research Advisory Panel  
Associate Chairs for Research  
on page 15.