

PENNSTATE



The Aerospace Engineering

Newsletter

a message from the department head

Dear Alumnae/Alumni

Hello again from Penn State's Department of Aerospace Engineering. In our past newsletter I briefly described the many advances that we anticipated for our department in the upcoming year. Now I am pleased to report that we are realizing many of our expectations, and in fact exceeding them in some areas.

The most obvious gain was made when four new faculty joined our ranks. Professor David Spencer joined us in the fall of 1999 in the area of spacecraft dynamics and control. Joining us in the fall of 2000 Professors Ken Brentner, Joe Horn, and Debbie Levin have already made important contributions to our department. Dr. Levin is teaching predominantly in the astronautics area and Dr. Horn in flight science and controls. We were previously thin in both those areas. Dr. Brentner strengthens two thrust areas: rotorcraft and high performance computing. All our new faculty are fully involved in teaching, advising both undergraduate and graduate students, and conducting sponsored research.

The new faculty have mostly "replaced" previously retired faculty. We are indeed fortunate that our Emeritus Professors have pitched in to continue to contribute to our teaching. Later in the newsletter you will read about Boeing Professor Emeritus Barney McCormick's advising of two student groups to national design competition awards. Professor Emeritus Skip Smith had previously carved out the design course (and national competition success) as one of his areas of contribution. Both Skip and Barney have been resurrecting the flight test course mixing in our new flight simulator with several small aircraft flight tests. Alumnus Bill Posnett deserves a lot of credit for making the simulator work in the two years he spent with us as a Teaching Assistant.

Professor Emeritus Tony Amos helped our teaching program last year but this year he returned to his birth country Ghana to help establish an Aerospace Engineering teaching program at the University of Science and Technology, Kumasi, Ghana. Penn State is very fortunate to have the

active participation of retired faculty in our programs.

The other major news from the department is the relocation of our main office to 229 Hammond (down the hall from 233 that most of you grew accustomed to). The department made a nice gain with newly remodeled space for most of our offices and acquisition of substantial additional lab space. The additional space will expand our teaching and research labs. Let me take this opportunity to thank (again) those of you who provided donations to help take advantage of the state equipment cost sharing opportunity for the new wind tunnel. I'm pleased to report that the fabrication is well underway and we expect the funds we raised will see us through to completion. Having a first class wind tunnel nearby in Hammond dedicated predominantly to teaching will be a big boost and will free up our large tunnel for expanded research activity. We hope to see the new tunnel ready for use this upcoming fall.

Alums are helping in many additional ways. Your partici-

pation in our web-based curriculum assessment has been playing an important role in our efforts to implement continuous improvement in our teaching activity. Large numbers of you are sending in notification of employment opportunities. These are all displayed prominently in our hallway glass cases. It is very satisfying to see ample employment opportunities for our graduates. This will become more important since our enrollments are increasing at a healthy rate.

We are always pleased to hear of the career progress of our alumns, so please keep your messages coming. Best wishes for continued success in your endeavors.

Sincerely,

Dennis K. McLaughlin

Dennis K. McLaughlin

New Faculty

Four new faculty have joined the Aerospace Engineering Department.

Dr. Kenneth S. Brentner, Associate Professor of Aerospace Engineering, joined our faculty in July 2000. He was a senior research engineer in rotorcraft acoustics and computational aeroacoustics in the Aerodynamics, Aerothermodynamics and Acoustics competency at NASA Langley Research Center. He received his B.S.



degree in 1983 in Aeronautical and Astronautical Engineering (with highest distinction) from Purdue University. In 1987, he received a Master of Science degree in Aeronautical Engineering from the George Washington University, Joint Institute for the Advancement of Flight Sciences (JIAFS). In 1991, he received his Ph.D. from the Department of Engineering/Acoustics from the University of Cambridge, Corpus Christi College, United Kingdom. Dr. Brentner has been serving as an Associate Editor for the Journal of the American Helicopter Society since 1998.



Dr. Joseph F. Horn, Assistant Professor of Aerospace Engineering, joined our faculty in July 2000. He came to Penn State from Sikorsky Aircraft Corporation and also worked for Piasecki Aircraft in Essington, PA prior to his Ph.D. studies. Dr. Horn received his B.S. degree in May 1990 in Aerospace Engineering (with

Distinction) from the University of Virginia and his M.S. degree in August 1992 in Mechanical and Aerospace Engineering from the same university. He received his Ph.D. in Aerospace Engineering in June 1999 from the Georgia Institute of Technology. Dr. Horn's research is focused in the area of flight mechanics and controls.

Dr. Deborah Levin, Associate Professor of Aerospace Engineering, joined our faculty in August 2000. She came from the George Washington University in Washington, DC, where she was a Research Professor and lecturer for the Department of Chemistry. Dr. Levin received her B.S. degree in 1974 from the State University of



New York at Stony Brook and her Ph.D. in June 1979 from the California Institute of Technology. She worked as a researcher and task leader at the Institute for Defense Analysis (IDA). Dr. Levin's research area is modeling of chemically reacting flows, optical radiation and space experiments.



Dr. David B. Spencer, Assistant Professor of Aerospace Engineering, joined our Penn State faculty in August 1999. He was Head of the Spaceflight Dynamics and Control Group at the U.S. Air Force Research Laboratory, Kirtland AFB, NM. Dr. Spencer's research efforts have been focused in the area of spacecraft dynamics and control. He

received his B.S. degree in Mechanical Engineering in 1983 from the University of Kentucky, his M.S. in Aeronautics and Astronautics in 1985 from Purdue University, and his Ph.D. in 1994 in Aerospace Engineering Sciences from the University of Colorado. Dr. Spencer is an Associate Editor for the AIAA Journal of Spacecraft and Rockets.

Awards & Recognition

Faculty

PROMOTIONS:

Cengiz Camci was promoted to Professor as of July 2000. Dr. Camci joined the Penn State faculty as an Assistant Professor in September 9, 1986 and was promoted to Associate Professor in July 1993. He received his doctorate from the Von Karman Institute, Belgium in May 1985 and was a Research Associate at the Von Karman Institute before coming to Penn State. Dr. Camci is very active in turbomachinery heat transfer research, having developed major new facilities and unique experimental techniques.

Robert G. Melton was promoted to Professor as of July 2000. Dr. Melton joined the Penn State faculty as an Assistant Professor in September 1, 1981 and was promoted to Associate Professor in July 1987. He received his doctorate from the University of Virginia in 1982 in Engineering Physics. While at Penn State, Dr. Melton has developed several new courses in the spacecraft curriculum and has also been recognized as one of the most outstanding teachers in the College of Engineering. Dr. Melton received the Premier Teaching Award from the College of Engineering in 1992. He is now serving as Director of Undergraduate Studies.

FACULTY AWARDS & RECOGNITION:

Cengiz Camci, professor of aerospace engineering, was awarded a 1999 DOE/AGTSR faculty fellowship for writing a reference book on "Liquid Crystal Thermography in Aero-thermal Systems". He also was awarded a NASA Lewis/Glenn Research Center visiting Faculty Fellowship during January, February, and March 1999 and

received an Ecole Centrale Lyon (France) Visiting Faculty Fellowship during April/May and June 1999. Finally, he was named a fellow of the American Society of Mechanical Engineers (ASME) and received a best paper award from ASME's International Gas Turbine Institute. Dr. Camci was honored for his paper, "A Student-Executed, Industrial Gas Turbine Design Project with an Industrial Deadline."

Farhan S. Gandhi, assistant professor of aerospace engineering, was appointed chairman of the AHS Design Technical Committee in June 1999. He is also serving as Guest Editor for Smart Materials and Structures Journal, Special Issue on Rotorcraft Applications. This issue will be published in Spring 2001.

Dennis K. McLaughlin, Professor and Head, Department of Aerospace Engineering, was named chair of the AIAA Aeroacoustics Technical Committee.

George A. Lesieutre and **Michael M. Micci**, professors of aerospace engineering, each won a 2000 Penn State Engineering Society Award for Outstanding Research in the College of Engineering.

George A. Lesieutre, professor of aerospace engineering, was awarded the 1999 Adaptive Structures and Material Systems Best Paper Award from ASME Aerospace. Also, Dr. Lesieutre was named chair of the AIAA Adaptive Structures Technical Committee.

Lyle N. Long, professor of aerospace engineering, director of the Institute for High Performance Computing and co-director of the Rotorcraft Center received a certificate of merit from the American Institute of Aeronautics and Astronautics.

David B. Spencer, assistant professor of aerospace engineering, was named Associate Editor for the AIAA Journal of Spacecraft and Rockets. He also was awarded the Pearce Development Professorship (an endowed professorship) at Penn State.

Edward C. Smith, associate professor of aerospace engineering, was appointed chairman of the AHS Dynamics Technical Committee in May 2000.

Mark D. Maughmer, associate professor of aerospace engineering, has been cited by *Soaring Magazine* for his accomplishments in designing winglets for high-performance sailplanes. During the recent racing season, the winning glider in all four major classes at U. S. National contests were equipped with his designs. Also, during the past year, he was named Technical Chairman of OSTIV (The International Organization for the Science and Technology of Soaring).

Michael M. Micci, professor of aerospace engineering, has completed his three year service as associate editor of the AIAA Journal of Propulsion and Power.

Robert G. Melton, professor of aerospace engineering, has been reappointed as Associate Editor of the Journal of Guidance, Control, and Dynamics. Also, he was elected vice president-technical of the American Aeronautical Society. His term of office will be one year.

Philip J. Morris, professor of aerospace engineering, began service as an Associate Editor of the AIAA Journal in January, 1999.

Awards & Recognition

STUDENT AWARDS:

The Penn State Aerospace student team, with Dr. Barnes McCormick, Boeing Professor Emeritus of aerospace engineering as their faculty advisor, won 3rd place in the 1999-2000 NASA/FAA General Aviation Design. The award was presented at a special ceremony at the Experimental Aircraft Association's Air Venture 2000 in Oshkosh, WI on Saturday, July 29, 2000. Participating students were **Richard Ackerman, Kelly Bott, Paul Bunker, David Clayton, David Matsumoto, James O'Connor, Dan Susich, David Wisniewski, Eric Frederick, Juan Negron, Luis Rodriguez** and **Tom Urie**.

An additional Penn State undergraduate team, with Dr. McCormick as their faculty advisor, has won 1st place in the American Helicopter Society student design competition. **Darryl Genovesi** and **Joseph Wolfe** were the leaders of the winning team. Darryl is presently in graduate school at Penn State and Joe is employed at Boeing in Philadelphia.

Xinwen Xiao, Aerospace Engineering, and **James Tallman**, Mechanical Engineering, have both been awarded a \$1,000 Beginning Engineer Fellowship by the ASME/IGTI (The American Society of Mechanical Engineers/International Gas Turbine Institute) Board of Directors. This award is to be used to assist them with their travel expenses to the ASME Turbo Expo 2000 Exposition and Users Symposium in Munich, Germany, May 8-11, 2000 to present their

respective papers. Jim is the co-author of the two part technical paper (co-authored with B. Lakshminarayana). The paper is entitled "Numerical Simulation of Tip Leakage Flows in Axial Flow Turbines with Emphasis on Flow Physics, Part I: Effect of Tip Clearance Height; and Part II: Effect of Outer Casing Relative Motion.

Timothy Cichan was presented the Mid-Atlantic Region Sigma Gamma Tau award for an outstanding student who has demonstrated exceptional academic and technical achievement, participation in extracurricular activities and interested in their chosen profession. Timothy is presently a graduate student in Aerospace Engineering at Penn State.

The AIAA 2000 Mid-Atlantic Region Student Conference was held here at Penn State, April 7-8, 2000. Graduate paper competition winners were:

Kristin D. Culler, 1st place for her paper entitled "Actively Controlled Isolation and Pointing Using Flexensional Piezoelectric Actuators" at the 2000 conference. **Eric H. Cardiff** and **Silvio Chianese** tied for 2nd place. Eric's paper was entitled "High Performance Rocket Propellant Combustion Stability Characteristics" and Silvio's was entitled "Spectroscopic Analysis of Plasmas Developed for Enhanced Supersonic Hydrocarbon Combustion." Kristin subsequently won the Dr. Abe Zarem Award for Distinguished Achievement, sponsored by AIAA, which included attending the International Astronautics Federation Conference in Rio de Janeiro to present her research.



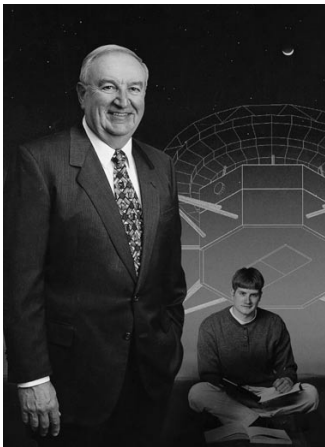
Student Team accepting award

Left to right - Dr. Barnes McCormick (faculty advisor), Jim O'Connor, Cecilia Hunziker (FAA Regional Administrator for the Great Lakes Region), Luis Rodriguez, Bill Posnett (the team's technical advisor), and Hank Jarrett (Deputy Manager, NASA General Aviation Program Office).

Alumni & Alumnae Notes

1950s

Mr. Jim Marley (B.S. 1957), a retired chairman of the board of AMP Incorporated, leads the College of Engineering committee of eighteen alumni volunteers to campaign to raise \$1 billion by June 30, 2003, to increase Penn State's endowment to a level comparable with other Big Ten Universities. In 1997, Jim and Judy Marley endowed a graduate fellowship which enabled Paul Reigel to earn his M.Eng. in 1999 and will be available each year to a deserving student.



Mr. James Marley (B.S. 57) and Paul Reigel, M. Eng., 1999

1960s

Capt. Bill Posnett, III, retired (B.S., 1969) has returned to Pax River as an AV-8B Propulsion Systems Engineer. In his two years as a Teaching Assistant to Professors McCormick and Skip Smith, Bill made tremendous contributions to our aircraft design and flight test courses. His responsibilities include the planning and development of all system technical requirements, development and implementation of program plans, and

the coordination of work efforts by field activities and contractors. As the Senior Propulsion and Power Systems Engineer for the F402, he plans, initiates, directs, and coordinates all technical and system program management functions of the F402 Pegasus engine.

Mr. Mike Markowski (B.S. 1968) has become a leading authority on hang gliders and ultralight aircraft. His company, Markowski International Publishers has recently produced a facsimile of "Birdflight as the Basis of Aviation" a compilation of the original writings of Otto Lillenthal. This book presents the very foundation of the science of aerodynamics and aeronautical engineering. It was studied by most of the early pioneers of flight and the Wright Brothers considered Lillenthal as their hero. Reading it would give aero students and practitioners excellent basic insights. Mike's e-mail is: amaeroarch@aol.com.

1970s

Dr. Alan Egolf (B.S. 1971, M.S. 1973) was appointed Chief of Aerodynamics of Sikorsky Aircraft last year.

This past year, **Mr. William (Bill) Guzik** (B.S. 1979) was appointed President of Sound Technologies, Inc. in State College, PA. Sound Technologies is a fast growing local company that specializes in the design and manufacturing of ultrasonic probes (and the associated computer and software systems) for medical diagnostics.

1980s

Dr. Matthew Warfield (M.S., 1985, Ph.D., 1987) has received a promotion to Associate Technical Fellow, The Boeing Company, Seattle, WA.

1990s

Mr. Larry Smith (B.S. 1990) has received the John E. Burdette Memorial Award honoring the outstanding flight test project engineer or scientist at the Naval Air Warfare Center Aircraft Division, Patuxent River, MD. Mr. Smith is a 1995 graduate of the United States Naval Test Pilot School and is currently assigned to the NAVAIR Testing & Evaluation Engineering Department, Propulsion, Power, and Mechanical Systems Division. He has been a member of the V-22 integrated test team for the last 10 years.

Mr. Peter Heasley, (B.S. 1991) is a member of TPS Class 110 and was honored for his recent work with the high altitude and endurance unmanned arial vehicle program (HAEUAV). He was awarded specifically for his efforts as the program's DarkStar government test director. He is currently assigned to the Shipboard Suitability Competency, Rotary Wing Branch, Patuxent River, MD.

Mr. Larry Trick, (B.S. 1982, M.Eng. 1994) is now the Assistant Deputy Program Manager for Visual Landing Systems, at the Naval Air Systems Command in Patuxent River, Maryland.

Prior to that he was the Branch Head for Rotary Wing Ship Suitability and Team Leader for Dynamic Interface for 12 years. Larry has been a very active alumni in the area of recruiting and arranging for student tours of the Navy facilities at "Pax River."

Dr. Kevin Kinzie, (M.S. 1991, Ph.D., 1995), joined NASA Langley Research Center following three years at General Electric Aircraft Engines. Kevin now directs the High Speed Jet Noise Laboratory at NASA Langley originally developed by another Penn State Alumnus, **Dr. Jack Seiner**, Ph.D. (M.S. 1969, Ph.D. 1974). Jack has moved on to become Professor and Associate Director of the National Physical Acoustics Laboratory at the University of Mississippi, Oxford, MS.

Mr. Mike Arata, (B.S. 1991) has been promoted to Lead Engineer for United Airlines' Chicago O'Hare Operations. Mike informed the department of the need for technical personnel who temper these advancements with practical and cost effective applications.

Mr. William P. Geyer, Jr. (B.S. 93, M.S. 95) has received international recognition for his work on the V-22 Osprey. Mr. Geyer, the ships suitability lead engineer with the V-22 integrated Test Team, was presented the AHS Bagnoud Vertical Flight award. This award is presented yearly to outstanding contributors to vertical flight by an AHS member under the age of 30.

See Photo - Next Page



Left to right: Larry Trick (B.S. 1982, M. Eng. 1994), Capt. Brian Watkins, Bill Geyer (B.S. 1993, M.S. 1995), Joe Carbonaro, and Ray Wernecke)

Scholarship/Award Recipients

Carl A. Shollenberger Memorial Scholarship in Aerospace Engineering
Derek Bridges

Paul Morrow Endowed Scholarship and Rayfield Graduate Fellowship
Timothy Cichan

H. Thomas & Dorothy Willits Hallowell Scholarship
Kimberly A. Clark

Aero Pioneers Class of 1944 Scholarship in Aerospace Engineering
Kimberly K. Comstock

Lou Borges Scholarship in Aerospace Engineering
Timothy Cook

Rolling Scholarship and Richard W. Leonhard Scholarship in Aerospace Engineering
Eric Frederick

James Reynolds Norris Memorial Scholarship in Aerospace Engineering
Thomas Ivanco

Paul Morrow Endowed Scholarship and Steva Award in Aerospace Engineering
Jesse A. Linnell

Paul Morrow Endowed Scholarship and Boeing Scholarship in Aerospace Engineering
Lynette A. Lloyd

H. Thomas Hallowell Scholarship and Peery Memorial Award in Aerospace Engineering
Kurt Ludwig

Brunner, and Engineering Minority Scholarship
Jessica G. Mas

PSU Engineering and Allied Signal, Inc. Scholarship
Michael B. McClain

PSU Engineering Scholarship
Melissa Morehouse

Mary Ilgen Scholarship in Aerospace Engineering
Brian Munsky

Lou Borges Scholarship in Aerospace Engineering
Raymond Mussoline

Charles M. Kearns Scholarship
Stephanie Pulford

Engineering Minority Scholarship
Braulio Ramirez-Cruz

Paul Morrow Endowed Scholarship
Christopher L. Ranieri

Paul Morrow Endowed Scholarship and Boeing Scholarship in Aerospace Engineering
Jane M. Rydzewski

Vollmer-Kleckner Scholarship in Engineering
George W. Schlemmer

Paul Morrow Endowed Scholarship
Jeffrey R. Valania

Fellowship/Award Recipients:

Rotorcraft Center Fellowships

Anurag Agarwal
Phuriwat Anusonti-Inthra
Askari Badre-Alam
Christian Brackbill
Matthew Floros
Eric Hathaway
David Heverly
Jonathan Keller
Brendon Malovrh
Anirudh Modi
Martin Sekula
Steve Sharp
Patricia Stevens
Jian Hua Zhang

UM Rotorcraft Noise Fellowship
Nilay Sezer-Uzol
Lionel Tauszig

National Defense Science & Engineering Graduate Fellowship
Louis Centolanza

Glenn E. Singley Memorial Graduate Fellowship
Silvio G. Chianese

Dean's Fellowship and NASA GSRP Fellowship
Michael J. Doty

Faculty & Staff

Once again there have been quite a few changes to the staff in our department.

First, congratulations to **Sheila Corl** on her promotion to administrative assistant. Sheila had been our head staff assistant for the past two years.

Tammy Besecker, our full-time administrative assistant for 12 years, decided to switch to a part-time administrative position in our department. This enables her to spend more time with her family.

Debby Mayes was promoted to the head staff assistant position from her previous position as graduate program staff assistant.

DEPARTURES:

Darlene Carper left her position as staff assistant to Dr. Budgur Lakshminarayana in April after serving in the department for five years.

ADDITIONS:

Tammy Accordino, graduate staff assistant, joined the staff in August 2000.

Kristie Kalvin, undergraduate staff assistant, joined our staff in June 2000.



Kristie Kalvin



Tammy Accordino

Darlene is now a staff assistant with the Office of Telecommunications.

Shannon Schmidt left her position as undergraduate program staff assistant in April after serving in the department for four years. Shannon is now a staff assistant with the Department of Civil Engineering.

Abraham Mathew left his position as computer specialist in December 1999 after serving in the department in this position for two years. Abraham received his B.S. in Aerospace Engineering in 1997 and presently works in New York City.

Professor George S.

Dulikravich left his position as Associate Professor of Aerospace Engineering July 1999 to take a faculty position at the University of Texas in Arlington.

IHPCA

The Institute for High Performance Computing Applications (IHPCA) was established in consultation and cooperation with the colleges of science and earth and mineral sciences, the Center for Academic Computing and the Applied Research Laboratory. The Institute pools the talents of Penn State's internationally known researchers in algorithm development, numerical analysis, parallel computing paradigms and computational physics and engineering. The Institute is directed by Dr. Lyle N. Long, professor of aerospace engineering and Dr. Philip J. Morris, Boeing/AD Welliver is an Associate Director. The Institute helps faculty, staff and students to apply parallel approaches to numerically intensive simulation problems. The web page for IHPCA is at: <http://www.psu.edu/dept/ihpca/>

A Graduate Minor in High Performance Computing has been created to educate graduate students in scientific and high performance computing with an emphasis on the capabilities and uses of parallel computers. This new minor offers an opportunity for students in all colleges and majors to pursue a focused set of courses that emphasize the use of high performance computers to solve problems in science and engineering. Currently, there are 26 graduate students who have signed up for the Minor.

Dr. Long and several other faculty recently received an NSF MRI (Major Research Instrumentation) grant to build three virtual reality systems which will be connected via high-speed networks. One of these will be in the Aerospace Department, and the other two will be in Computer Science and Engineering and Chemistry. This \$1.3 million grant allowed us to purchase three Fakespace Raves and 27 graphics workstations from Hewlett Packard. These Raves will be used to view simulations, as flight simulators, and for other research. IHPCA continues to use Beowulf clusters of PC's for compute power, as well as the national supercomputer centers.

A group of faculty also received a grant under the very competitive NSF IGERT (Intergrative Graduate Education and Research Training) program for graduate education. This grant allowed us to form a "Center for Education in Many-Body Applications," and will fund roughly 18 graduate students for five years. The students will be from Aerospace, Chemistry, Materials Science, Chemical Engineering, Computer Science and Engineering, Physics, and Mathematics. The Center will emphasize Monte Carlo, molecular dynamics, and other particle methods. (<http://www.personal.psu.edu/lnl/cemba/>)

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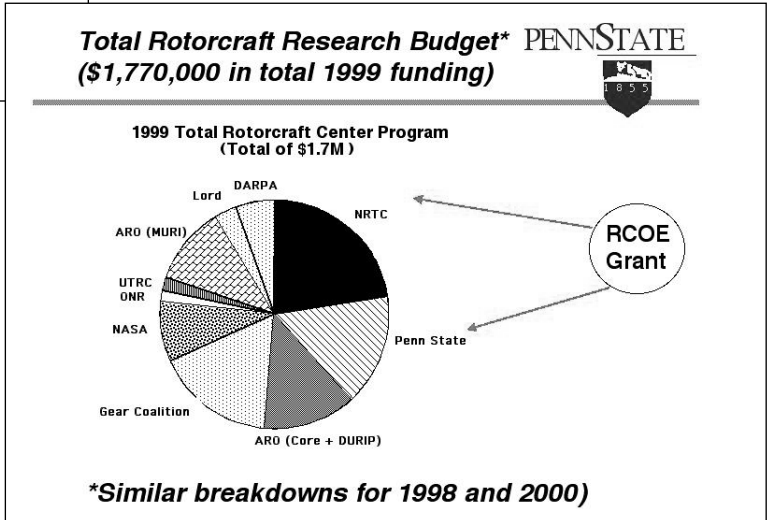
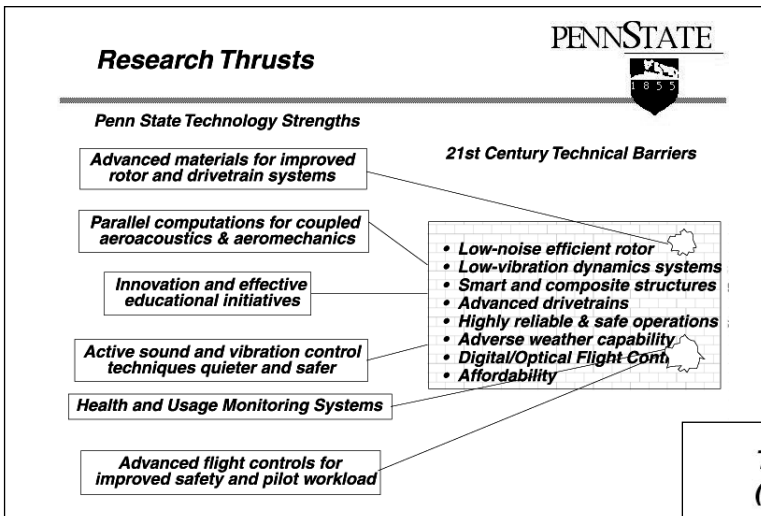
Dr. Long also created a new course this year entitled: "Java and Linux for Intelligent Systems." There is an ever-increasing need for aerospace engineers to understand object-oriented programming. Java is a very powerful language to use since it includes the capability for Graphical User Interfaces, Networking, Threads, and Objects. It is also easier to use than C + + . And with the increasing need for embedded computers, Linux has also become very attractive.

Several new faculty participants and researchers will help broaden the scope of the new Rotorcraft Center. Two of our newest faculty, Dr. Ken Brentner, Associate Prof. of Aerospace Engineering and Dr. Joe Horn, Assistant Professor of Aerospace Engineering, both have new research projects in the areas of rotorcraft noise prediction and rotorcraft flight dynamics and control. Dr. Mark Maughmer, Associate Professor of Aerospace Engineering joins the team in the area of applied aerodynamics and Dr. Cengiz Camci, Professor of Aerospace Engineering, will be involved with development of a new rotor rig test facility. In addition, Dr. Mary Frecker, Assistant Professor of Mechanical Engineering and Dr. Chuck Bakis, Professor of Engineering Science and Mechanics, will be working with Profs. Gandhi, Smith and Wang in collaborative efforts to bring compliant mechanism and flexible matrix composite material technologies into the rotorcraft arena. At the Applied Research Lab (ARL), Dr. Bill Mark will be working on new design methods for low noise, low vibration gears and Dr. Amulya Garga will be working with new data fusion techniques for rotorcraft health monitoring systems.

With our first generation of students finishing off theses and dissertations, and moving out to join the workforce we are once again getting ready for a new set of projects and students. For more information on our Rotorcraft Center, you can check online at <http://www.psu.edu/dept/rcoe/>.

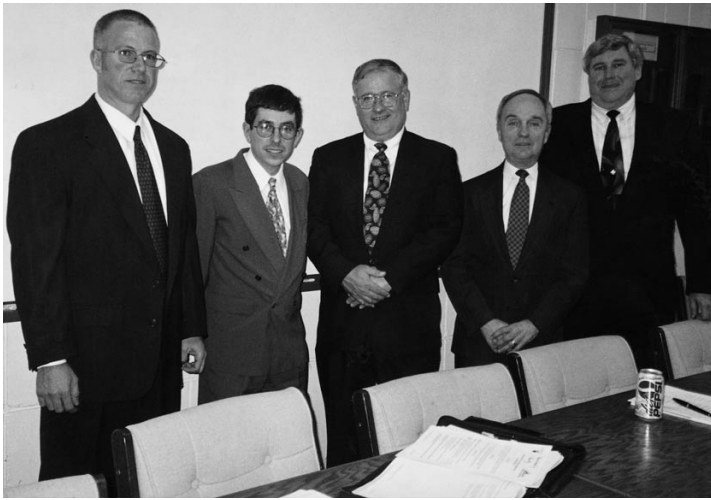
ROTORCRAFT CENTER of Excellence

Just as the new semester kicked in, we received notification from the National Rotorcraft Technology Center (NRTC) that Penn State had again been selected as one of three universities in the NRTC Rotorcraft Center of Excellence program. The second award covering the period from January 2001-December 2006, will provide base support for ten different research projects involving faculty and students from Aerospace Engineering, Mechanical Engineering, and Engineering Science and Mechanics Departments. Compared to our first Rotorcraft Center Award, this new \$600K/year program represents a 50% increase in our base award. Once again, Penn State administrators showed strong commitment to the Rotorcraft Center by contributing substantial resources in equipment funds, graduate and undergraduate student support, and fellowships.



IPAC Meets in March 2000

The Industrial and Professional Advisory Council (IPAC) met March 22-24, 2000. This year the council helped the department improve its strategic plan and to meet with students to encourage a discussion on courses and changes that should be made within the department.



(IPAC members attending were: (left to right)

Mr. Mike Nolan, Department Manager for Antenna Mechanical Systems and Space Services, Hughes Space and Communications Co. **Dr. Mark Lewis**, Professor of Aerospace Engineering at the University of Maryland. **Mr. Marc Sheffler**, Director, Apache Airframe/Aircraft IPT, at Boeing in Mesa, AZ. **Mr. John C. McKeown**, Deputy for Aircraft Systems Engineering with the Naval Air Systems Command, Naval Air Station, Patuxent River, MD. **Mr. Edward White**, Manager of the Smart Structures and Systems at McDonnell Douglas Aerospace (MDA) in St. Louis, MO

IPAC members unable to attend were:

Dr. Anne Harlan, Director, FAA Technical Center, Atlantic City International Airport. **Dr. Paul Leamer**, Director, F-16 USAF Program, Lockheed Martin Tactical Aircraft Systems
Mr. John Myers, Retired CEO of Thiokol Corporation

Outstanding Engineering Alumnus (OEA)

In the spring of 2000, Mr. Louis J. Borges was selected as a College of Engineering Outstanding Engineering Alumnus. Mr. Borges earned his bachelor's degree in 1944 as part of the first aeronautical engineering option class within the Department of Mechanical Engineering at Penn State. Mr. Borges spent most of his professional life (30 years) with the U.S. Army at the Branch Management level, with direct involvement in flight test engineering of numerous vehicles. Mr. Borges became an expert in many aspects of flight test engineering. He planned and managed the flight testing of a number of the U.S. Army Aircraft/helicopter acquisitions. During his service with the US Army, he served as Chief of R&D, Chief of the Airworthiness Branch, and Chief of the Aeronautics Branch. Upon resignation from the U.S. government service in 1976, he was president of a real estate and equipment leasing company. In 1998, Mr. Borges established an endowed department scholarship.

Short Courses Taught by PSU Aerospace Professors

Professor George A. Lesieutre was organizer and instructor for an AIAA Short Course at the AIAA Structures, Structural Dynamics and Materials Conference, in Atlanta, GA, April 1-2, 2000. This course was entitled "**Adaptive Structures: Practice and Promise.**"

Professor Lyle N. Long taught an AIAA Short Course on **Introduction to Parallel Computing** at the Aerospace Science Meetings in Reno, January 2000 and plans to offer the course again in January 2001. This course was well attended by people from academia, government, and industry. It covers material such as current and future parallel computers, Fortran 90/HPF parallel programming, Message Passing Interface (MPI), Java, parallel performance, and several applications.

Professor Philip Morris taught a short course at the NASA Langley Research Center entitled **Aircraft Noise**, October 21 & 22, 2000.

Boeing Professor Emeritus Barnes W. McCormick again offered the short course entitled **Rotary Wing Technology** from August 14-18, 2000. This makes the 15th consecutive year that the course has been presented. The course was attended by approximately 38 people including one from the Netherlands, one from France, five from Canada, one from the UK, one from Japan, three from Singapore, and one from Italy. Ten of the U.S. attendees were from U.S. industries while the remainder was from NASA and military research organizations.

The course began with a lecture by the Director, Dr. Barnes McCormick, on history and some basic fundamentals of aerodynamics and dynamics. This was followed by a lecture by Mr. Ray Prouty on applied aerodynamics and on by Dr. Dick Bennett on rotor dynamics. Next, Dr. Pat Curtiss covered the topic of helicopter flight mechanics. He was followed by Mr. Pete Dixon who presented material concerning the use of composites in helicopter structures, particular with regard to rotor blades. Finally, Dr. John Leverton closed the course with a lecture on acoustics. As in the past, the course was held at the Nittany Lion Inn on campus and included an informal picnic the first night for attendees to get acquainted and a closing banquet on Thursday night.



2000 Aerospace Outstanding Engineering Alumnus

Dr. Dennis McLaughlin, Head, Department of Aerospace Engineering and
Mr. Louis J. Borges.

Aerospace Student Societies

AeroGSA

This year's officers of AeroGSA, the department's graduate student association are: Carl Roos, President, Todd Ulrich, Vice President, Brian Herndon, Secretary, and Eric Cardiff, Treasurer. Last year, 1999-2000, the officers were: Mike Doty, President, Eric Cardiff, Vice President, Ben Bernocco, Secretary, and Bill Posnett, Treasurer. The group was first organized in 1994 to promote interaction between the Aerospace Engineering graduate students and the faculty and staff. AeroGSA hears concerns from graduate students and brings them to the attention of the department and also serves as a focal point for graduate student participation in the operation of the department. The officers of AeroGSA volunteer time to help with departmental events. A tour of facilities at Penn State used by Aerospace students for prospective graduate students is conducted in the spring and AeroGSA also organizes an orientation for new and returning graduate students before each fall semester.

Members of AeroGSA represented the Aerospace Department this past April during Space Day 2000 at Penn State. The one-day event was held in the HUB-Alumni Hall and brought together exhibits from a variety of departments for a public display of the space science and exploration being performed on campus. Another important event during the past year was the annual graduate student discussion with the Aerospace Engineering IPAC panel. As a result of communication between the IPAC committee, the department and the students, some new courses in programming and graduate level design were offered this academic year.

Sigma Gamma Tau

This year's officers of Sigma Gamma Tau, the National Aerospace Engineering Honor Society, are: Jeff Valania, President, Joe Gasbarre, Vice-President, Mike Sullivan, Secretary, Kim Clarke, Treasurer. Officers for the years 1999-2000 were: Tim Cichan, President, Eric Frederick, Vice President, Tom Urie, Secretary, and Jane Rydzewski, Treasurer. The Induction Ceremony for the Penn State chapter was held on March 21, 2000 at the Atherton Hotel. New members and officers were introduced. Dr. Wolfgang Mayer, on sabbatical from DLR Lampoldshausen, Germany, was the special speaker. Dr. Mayer, Head of the Propellants and Combustion Lab and Director of the National Technology Programme for Cryogenic Rocket Engines in Germany, oversees research on rocket propulsion for the German equivalent of NASA and taught the Space Propulsion and Power course, Aero 430, during the Spring 2000 semester. Dr. Mayer gave a very interesting talk about the various German liquid rocket research programs that he supervises. Sigma Gamma Tau continues to provide evening tutoring services for Aerospace Engineering courses.

American Helicopter Society

The Penn State student chapter of the American Helicopter Society participated in a wide range of activities during the 1999-2000 academic year. The officers for 2000-2001 are: Derek Bridges, President, Roberto Sarjeant, Vice President. The officers for 1999-2000 were: Darryl Genovesi, President, Brian Munsky, Vice President, and Derek Bridges, Treasurer. During the meetings, AHS hosted a number of speakers, including Bill Geyer (the most recent recipient of the AHS Francois-Xavier Bagnoud Award), who spoke about his experience conducting shipboard suitability testing of the V-22 Osprey, and Jennifer Henderson, who discussed her experience as a flight test engineer going through the US Naval Test Pilot School. At a different Chapter meeting, Greg Johnson from the Penn State Applied Research Lab, related some of his experiences in the Marine Corps as a CH-46 pilot. At this same meeting the chapter had the opportunity to watch a rare documentary video on the technologically advanced but ill-fated Cheyenne Helicopter program from the 1970s. The video, as well as a section of a Cheyenne blade, was graciously donated to our Chapter by Mr. Al Yackle. Al, now retired and living in California, is an alumnus of Penn State (the Aero Pioneer Class of 1944) and a good friend of the department. Al was heavily involved with the Cheyenne program during his days at Lockheed. The chapter also went on a number of informational field trips: during the fall semester, we traveled to Philadelphia to tour the American Helicopter Museum and the Boeing Helicopter plant. Highlights included the RAH-66 Comanche simulator and the 20' x 20' wind tunnel. In the spring, the chapter visited Paxtuxent River Naval Air Station in Maryland to see the Navy's helicopter flight test facilities there. Several members also attended the annual AHS Forum, which was held in May in Virginia Beach. Lastly, a group consisting of Darryl Genovesi and Joe Wolfe, placed first in the undergraduate division of the 2000 AHS/Industry/NASA Student Design Competition, for which they received a \$1,000 award from Sikorsky, the competition sponsor. The theme of this year's competition was an autonomous Mars exploration rotorcraft, intended to be deployed from a future Mars lander.

For more information about the American Helicopter Society, you can check online at <http://navier.aero.psu.edu/~ahs/>

The AIAA student chapter at Penn State University was very busy in the fall semester. This year's officers are: Silvio Chianese, Chair, Shelly Brimmeier, Vice-Chair, Melissa Stutz, Secretary, and Michael Martini, Treasurer. The officers for 1999-2000 were Matt Wagner, Chair, Todd Ulrich, Vice Chair, and Mike Wanenchak, Treasurer. During the semester, the group had a number of speakers. The new faculty members spoke about their respective research projects and Dr. Rick Fleeter, founder and President of the small satellite and space transportation company, AeroAstro, Inc., spoke about the search for extraterrestrial utility. The faculty members that spoke were Dr. Kenneth Brentner on rotorcraft noise prediction, Dr. Joe Horn on flight mechanics and control of rotorcraft, and Dr. Deborah Levin on modeling optical emissions. Early in the fall semester, members of AIAA and the aerospace design class visited the NASA Goddard Space Flight Center. The students were shown the control center for the Hubble Space Telescope and were given a short lecture on how HST works and how it is operated. Tours of the thermal vacuum chamber testing area, clean room, and other testing facilities were given. A short lecture on the satellite MAP was given by one of the top designers. The head engineers of the HST project held a question and answer session at the end of the day for the students. Everyone enjoyed this trip and gained valuable knowledge about the space program and NASA.

Another trip was taken by the AIAA students and the aerospace propulsion class to Hartford, CT late in the fall semester to tour the Pratt and Whitney facilities. In the morning, the students were given a CFD presentation by one of the leaders in the field. Tours of the facilities included set-up procedures and the thermal, acoustics and vibrations testing areas. A representative from Sikorsky Helicopters spoke about their products and innovations in the vertical flight industry. A tour of Hamilton-Sunstrand included heat exchangers and propellers, as well as a full mock-up of the NASA space suit and other space shuttle components. All students enjoyed this glimpse into United Technologies and the opportunity to converse with engineers working in the aerospace industry.

Personal Information

Name: _____
 Penn State degree(s) and year(s): _____
 Current position (title) and duties: _____

 Company: _____
 Business address: _____
 Business telephone: _____
 Business email: _____
 Home address: _____

 Home telephone: _____

(Please indicate if you wish to participate in the department e-mail registry.)
 Yes No

Aerospace Department Curriculum

Now that you're away from us and in the workplace, please take a few moments in rating how our curriculum has prepared you for your career.

- A. Engineering Fundamentals** low high
- analysis and mathematical skills 1 2 3 4 5 n/a
 - aerodynamics 1 2 3 4 5 n/a
 - structures 1 2 3 4 5 n/a
 - dynamics 1 2 3 4 5 n/a

How could these fundamental areas be strengthened? (i.e., additional courses, etc.)

- B. Applied Coursework** low high
- aerodynamics 1 2 3 4 5 n/a
 - structures/composites 1 2 3 4 5 n/a
 - propulsion (space, turbomachinery) 1 2 3 4 5 n/a
 - classical controls 1 2 3 4 5 n/a
 - astrodynamics 1 2 3 4 5 n/a
 - stability and control 1 2 3 4 5 n/a
 - other: _____ 1 2 3 4 5 n/a

Did you receive additional education to help prepare you for your current position?
 If so, where and of what type? _____

- C. Computational/Computer Skills** low high
- UNIX 1 2 3 4 5 n/a
 - CAD (AutoCAD, ProEngineer) 1 2 3 4 5 n/a
 - FORTRAN programming 1 2 3 4 5 n/a
 - C programming 1 2 3 4 5 n/a

Of the undergraduate or graduate courses in the Aerospace engineering department, tell us which was your favorite and why. _____

Of course any additional comments are always welcome. _____



Thank you! Please return completed survey to Ms. Debby Mayers, 233 Hammond Building, University Park, PA 16802.

Sailplane Class

The Sailplane class, AERSP204H/404H, now has a web page with news about their current projects, such as the construction of the Griffin fuselage mock-up and the progress with the Falcon. The web address is <http://aerofp.aero.psu.edu/sailplane>.

NOTED CORRECTION:

Paul Glessner received his B.S. in 1984, not 1994 as printed in the Fall 1999 Newsletter.

Alumni/ae E-mail registry

We are continuing to compile our Alumni/ae Registry and we would like to thank all who have sent us updated addresses. Periodically we will send an e-mail to subscribing alums containing the e-mail addresses of their colleagues. This is a private list that is to be shared only with subscribing aerospace graduates.

If you are interested in adding your name to the list, (and receive a list of all alums in this data base) please send an e-mail to the department at <http://www.aero.psu.edu>

The Department of Aerospace Engineering

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