

# The Aerospace Engineering Newsletter

## *a message from the department head*

Dear Alumnae/Alumni:

I am pleased to introduce to you the 2003 edition of our department newsletter that reports on the activities in the Department for the calendar year 2002 and some of the spring 2003 events. The co-editors, Professors Joe Horn and Ed Smith and senior staff assistant Marilyn Warrender have made a special effort this year to include as much information on new activities of our alumni/ae as they could conveniently find. Many of the people included were your classmates so I hope you find the write-ups interesting and as a result, are motivated to send us a note on your latest business move, special achievement or whatever you would like. Thanks to Joe, Ed, and Marilyn for making this special effort and for doing a generally excellent job of reporting on the highlights of the past year.

You alumni/ae are located in about thirty states in the union and we could run a pool to bet on which state is in the worst financial position. Pennsylvania is among the majority of states that have seriously cut back expenditures to keep the Commonwealth budget within some semblance of balance. As a result, our Department, along with all others, suffered serious budget cuts (over the past several years) and our students, and their parents, are faced with escalating tuition costs.

In spite of the budget difficulty, the Department's situation is quite satisfying. Our student enrollments are growing strongly at the undergraduate level and modestly in the graduate program. Financial support from research contracts has also grown through the extra effort of our supremely qualified faculty. It is particularly gratifying to note that our newest faculty Professors Spencer, Levin, Horn, and Brentner, have made great strides in solidifying the research activities of the students under their advisement. For the Department, research and teaching facility development has been proceeding well and is described in more detail in the body of the newsletter. The capability of our facilities (including the numerous high performance computers) is something that makes us extremely proud.

The activities of our student societies enjoyed a resurgence this year. These are also summarized in the newsletter with our first ever career fair highlighted. The career fair was an excellent opportunity for several alumni/ae to visit our campus. The highlight of alumni visits occurred in June 2002 when 9 members of our Aero Pioneers held a reunion at Penn State. This was organized in conjunction with a celebration of Professor Barney McCormick's 75<sup>th</sup> surprise birthday dinner. All of these activities are described in more detail in the newsletter.

As a final comment, many of you will see advertisements this fall inviting applications for a new head of our Department. I will serve for one more year before stepping aside to give a new person the opportunity to lead this great Department. I am not anxious to end my service as department head, but do look forward to being able to commit more time to teaching and research.

Let me close now to allow you to get on with reading the newsletter. As always, we encourage you to send us a note telling us about your latest activities.

Best Regards,

Dennis K. McLaughlin  
[dkmaer@engr.psu.edu](mailto:dkmaer@engr.psu.edu)

# Awards & Recognition

## Faculty

### FACULTY AWARDS & RECOGNITION:

#### New Fellows:

**Philip J. Morris**, professor, was selected as a Fellow of the American Institute of Aeronautics and Astronautics.

**Robert G. Melton**, professor, was selected as a Fellow of the American Astronautical Society.

**Mark D. Maughmer**, professor, was selected as an Associate Fellow of the American Institute of Aeronautics and Astronautics.

#### Awards / Recognition:

**Kenneth S. Brentner**, associate professor, was presented with the 2002 Howard Hughes Award in recognition of the NASA Tiltrotor Aeroacoustic Code System Development Team for an outstanding improvement in fundamental helicopter technology. Dr. Brentner was also presented the Best Paper of the AHS Acoustics and Aeroacoustics sessions at FORUM 58, June 2002. The paper is titled, "Toward a Better Understanding of Maneuvering Rotorcraft Noise."

**Farhan S. Gandhi**, associate professor, received the Best Paper Award of the AHS Aircraft Design sessions at FORUM 58, June 2002. The paper is titled, "Helicopter Vibration Reduction Using Fixed-System Auxiliary Moments."

**Lyle N. Long**, professor, has been selected as editor-in-chief of the AIAA Journal of Aerospace Computing, Information, and Communication, August 2002.

**Barnes W. McCormick**, Boeing Professor Emeritus, was selected to receive the AIAA F. E. Newbold V/STOL Award for 2002. He also won the Penn State Engineering Society 2002 Distinguished Service Award which recognizes and rewards a current or former faculty member who has donated time, expertise, and energies in the form of outstanding and special service to a department, unit, or to the college. Dr. McCormick also was reappointed to a one-year term on the American Institute of Aeronautics and Astronautics' Academic Affairs Committee.



*Barnes W. McCormick with Newbold V/STol Award for 2002*

**Robert G. Melton**, professor, has been elected as vice president-publications of the American Astronautical Society.

**George A. Lesieutre**, professor, was awarded the AIAA Zarem Educator Award recognizing his careful mentorship and guidance of his students.

**Edward C. Smith**, associate professor (B.S. 1988), received the Penn State Engineering Society 2002 Outstanding Research Award which recognizes and rewards outstanding engineering researchers for accomplishments in advancing the frontiers of knowledge. These research awards are established to confer honor on individuals who, by their contributions to knowledge, have brought recognition to themselves, the College, and Penn State.

**David B. Spencer**, assistant professor, received a NASA/ASEE Summer Faculty Fellowship for summer 2002. During that time, he worked in the Navigation and Mission Design Section at NASA's Jet Propulsion Laboratory in Pasadena, CA. He worked on (and continues to work on) a NASA Discovery Mission, Dawn, which will be sending a spacecraft with a low-thrust propulsion system to rendezvous and orbit two asteroids, Ceres and Vesta. Additionally, he is involved with future architecture studies for NASA's Deep Space Network and how these architectures affect spacecraft navigation.

#### **Philip J. Morris and Debra J. Witherite**

were given special University and College recognition for 25 years of service at Penn State on April 9, 2003 at a College of Engineering ceremony. Morris is the Boeing/A.D. Welliver Professor and has held that title since 1993. Deb is the Department accounting clerk. Both Morris and Witherite received a 25-year chair from Penn State.



## THE MCCORMICK HONORARY

### ALUMNI LECTURE SERIES:

#### **Daniel Mooney**

(B.S. 1980) was selected as the third Barnes W. McCormick Honorary Alumni Lecture awardee in March 2003. Dan is vice president of product development for Boeing Commercial Airplanes, where he leads the group responsible for developing new and derivative commercial airplane products and features. This includes preliminary design, enabling technologies, Phantom Works advanced commercial research and development, and product and feature strategy. Prior to assuming this position in May 2001, Mooney served as deputy to the vice president of product strategy and development.

Dan received his B.S. in civil engineering from Penn State in 1980. He then joined the Boeing Company as a stress analyst and spent his first year with the company in Philadelphia, PA. He was recruited by fellow Penn State alum, and now Boeing executive focal for Penn State, Steve Glusman, and worked on

a number of advanced composite development projects, including the 7J7 empennage and the V-22 tiltrotor aircraft wing. From 1992 to 1994, he served as Boeing Commercial Airplanes technical representative in Washington, D.C. As the manager of aviation affairs, he was the technical liaison with government agencies such as NASA and the Federal Aviation Administration. He went on to serve as chief project engineer for the 757-300, deputy chief project engineer for the 757 Program, and chief project engineer for the 767 Program. Mr. Mooney's lecture, titled "Airplanes for the 21st Century," presented advanced concepts and emerging data to support future commercial airplane designs.

## Aerospace Engineering ABET Status Report

The Accreditation Board for Engineering and Technology (ABET) held its periodic site visit and program review on October 6-8, 2002. This was the College's first visit since ABET implemented its new rules "Engineering Criteria 2000." Under this new system, each department is required to define its educational objectives, assess how well these are being met, and make appropriate changes as a result. Aerospace Engineering's assessment includes ten procedures; we especially thank those of you who participated in surveys of current students, alumni/alumnae, and employers. Assessment will be an ongoing process, and we always welcome your comments and suggestions. ABET's rules do not permit us to comment on the outcome of the visit until we receive a formal written report in August 2003. However, we can say that Professor Melton, aerospace director of undergraduate studies, did an outstanding job organizing the department's preparation for the review.

## Outstanding Engineering Alumnus (OEA)

In Spring 2002, **James F. Hargrave**, vice president, Navy Helo Programs, Lockheed Martin Integration Systems, Owego, NY, was selected as the Aerospace Engineering 2002 Outstanding Engineering Alumnus. He is primarily responsible for the LAMPS MK III Program which includes the SH-60R Multi-Mission helicopter remanufacture program. He is also responsible for the Navy's H-60 Common Avionics Development Program, H-60 Airborne Mine Counter Measures (AMCM) System Integration and the Navy's Armed Helo Program. Hargrave earned his bachelor's degree in 1969 from Penn State in Aerospace Engineering.



Hargrave's previous assignments include program manager for the Air Force Combat Talon II program, with responsibility for all aspects of engineering development and production. The CT-II program produced 24 MC-130H aircraft for the Air Force Special Operations Command. Hargrave has more than 20 years of involvement with the LAMPS program in a variety of management and technical capacities. Hargrave's career also includes management assignments in the areas of subcontract

program management, systems engineering, integrated logistics support, and integration and test.

## IPAC Meet in March 2002

The Industrial and Professional Advisory Council (IPAC) met in March 2002. The council helped the department in several areas: the department ABET review which was conducted in the Fall 2002; laboratory and classroom updates; and the development of metrics and goals related to the Long Range Plan and Strategic Plan. Recommendations were made for departmental changes to help our Department grow and better educate our students.

### 2002 IPAC Members:

**Dennis Filler** (attending in the place of Anne Harlan). Filler is currently serving as the acting director of the Office of Knowledge Management at William J. Hughes Technical Center; **James Hargrave**, vice president, Lockheed Martin Systems Integration, Owego, NY; **Paul C. Leamer**, director, Joint Strike Fighter Advanced Initiative at Lockheed Martin Aeronautical Systems, Fort Worth, TX; **Marc W. Sheffler**, deputy director, Rotorcraft Shared IPT's, The Boeing Company, Mesa, AZ; **James Woodburn**, chief orbital scientist, Analytical Graphics, Malvern, PA.

### Members unable to attend:

**Anne Harlan**, director, Federal Aviation Agency, William J. Hughes Technical Center, Atlantic City, NJ; **Mark Lewis**, professor of aerospace engineering, University of Maryland, College Park, MD; **John C. McKeown**, deputy for aircraft systems engineering, Naval Air Systems Command, Naval Air Station, Patuxent River, MD; **John R. Myers**, retired president and CEO of Thiokol Corporation and Textron Lycoming; **Michael Nolan**, department manager for Antenna Mechanical Systems and Spacecraft Services at Boeing Satellites Services, Los Angeles, CA; **Cristina M. Stack**, flight test engineer, Naval Air Systems Command, Naval Air Station, Patuxent River, MD.



**2002 IPAC Members**

*James Woodburn, Paul Leamer, Marc Sheffler, James Hargrave, Dennis Filler*

## Lyle Long AIAA Journal Editor-In-Chief

Lyle N. Long, professor of aerospace engineering (with joint appointments in acoustics and in computer science and engineering), was selected as editor-in-chief of the new Journal of Aerospace Computing, Information, and Communication by the American Institute for Aeronautics and Astronautics (AIAA). AIAA is the largest aerospace professional society in the world. This journal will begin publication in January 2004, and will be devoted to the applied science and engineering of aerospace computing, information, and communications.

Computing, information, and communication have become very important to aerospace systems in recent years. For example, the Boeing 777 has more than 1,000 onboard processors and more than four million lines of software. A special operations Blackhawk helicopter has about 2,000 pounds of wire. Autonomous intelligent unmanned vehicles are becoming increasingly important.

Original archival research papers will be published which include significant scientific and technical knowledge and concepts. The journal will publish qualified papers in areas such as real-time systems, computational techniques, embedded systems, communication systems, networking, software engineering, software reliability, systems engineering, signal processing, data fusion, computer architecture, high performance computing systems and software, expert systems, sensor systems, intelligent systems, and human-computer interfaces. Articles are sought which demonstrate the application of recent research in computing, information, and communications technology to a wide range of practical aerospace engineering problems. The journal will include letters, papers, and invited papers. All articles will be peer reviewed by an editorial board, to allow rapid dissemination. There are currently 13 associate editors, including one from Penn State (Prof. Paul Plassmann of computer science and engineering). The managing editor will be Meredith Cawley at AIAA. The journal will be electronic (on web) only, and published "continuously." The journal will also include multimedia content. The paper submission and review process will be completely on-line, with no need for paper copies. This will be done through AIAA's WriteTrack. More information can be found at <http://www.personal.psu.edu/lnl/jacicl/> or <http://www.aiaa.org/publications/index.hfm?pub=36>. Prof. Long's webpage is at: <http://www.personal.psu.edu/lnl>.

## Barnes W. McCormick Honored at Aero Pioneer Reunion

A good time was had by all at a departmental function held on May 30, 2002, at the Nittany Lion Inn that combined the Aero Pioneer 58<sup>th</sup> Class Reunion with a surprise 75<sup>th</sup> birthday celebration for Professor McCormick. Guests in attendance were nine of the Pioneer class members, some accompanied by their wives, several Aerospace Engineering faculty and staff and their spouses, Dr. McCormick's wife, Emily, and their daughter, Cindy Miceli, and two of her five children, Emily Ann,

and Tommy Miceli. In addition, several of the McCormick's local friends, professional contacts and their spouses attended the event.

The evening began with the introduction and recognition of each member of the Aero Pioneers, Class of 1944, and a discussion on the impact they had on aeronautical engineering education. In 1942 this group of Mechanical Engineering students were recruited as "Aero Option" students into a new aeronautical engineering curriculum established by Dr. David Peery. Dr. Peery went on to head the department now known as the Department of Aerospace Engineering. The Aero Option students, Class of 1944, pioneered aeronautical engineering at Penn State.

The faculty and staff of Aerospace Engineering had the pleasure of recognizing each class member in celebrating their reunion. The Aero Pioneers and spouses in attendance at the 58<sup>th</sup> reunion were: Louis and Rosemarie Borges, Luther and Dorothy Boyer, Boris and Margaret Osojnak, John and Jean Scheppman, Samuel and Betty Schnure, Donald and Jayne Steva, Donald Wion, Albert and Ruth Yackle, and Frederick and Patricia Young.

The festivities of the evening continued with dinner and the honoring of Barney McCormick for his enormous contributions over the last 50 years to Penn State and the Department. The celebration of his 75<sup>th</sup> birthday along with the special guest speakers who spoke of Barney's accomplishments over the years made the evening an enjoyable one for all in attendance. Guest speakers were Dennis McLaughlin, professor and head of aerospace engineering, Vincent Pass, retired professor of architectural engineering, J. William Holl, professor emeritus, aerospace engineering, Mark Maughmer, professor of aerospace engineering, Edward Smith, associate professor of aerospace engineering and Albert Yackle, aerospace pioneer reunion coordinator, and Barney's daughter, Cindy Miceli.

Barney was presented with gifts from the Department and letters from some of his contacts who were not able to attend the celebration. A memorable part of the evening came when Al Yackle from the Aero Pioneers presented Barney with a gift from the Pioneers—a Penn State singing lion; and Barney, along with the Aero Pioneers and several others, sang the "Fight On, State" song with the Lion.



**Those Pioneers attending were:**

(Front Row) Frederick Young, Donald Steva, Albert Yackle, Samuel Schnure, Donald Wion (Back Row) John Scheppman, Boris Osojnak, Luther Boyer, Louis Borges

## Undergraduate Scholarship/ Award Recipients

### COLLEGE OF ENGINEERING AND DEPARTMENT OF AEROSPACE ENGINEERING

#### *Aero Pioneers Class of 1944 Scholarship*

James Doyle  
Pi-Yang Liao  
Adam Steele

#### *Lou Borges Scholarship*

Peter Hammond  
Emilia Speal

#### *Honeywell International Foundation*

Anthony DeLullo  
Rebecca Rosenberg

#### *Mary Ilgen Memorial Scholarship*

Ericka Noonan

#### *Richard W. Leonhard Scholarship*

Blair Basom  
Lisa Hazinski

#### *John & Brenda Myers Scholarship*

David Durst

#### *James Reynolds Norris Memorial Scholarship*

Patrick Garrett

#### *David J. Peery Memorial Scholarship*

Paul Smidansky

#### *Carl A. Shollenberger Memorial Scholarship*

Nicholas Baxter

#### *Donald G. and Jayne L. Steva Scholarship*

Christopher Scott

During their visit, the Pioneers were given a tour of the Hammond laboratories including the computer clusters, Rave Room and the "California" Wind Tunnel. Barney gave a presentation titled "WW II - The Glory Days of Aviation." Students gave an overview of their projects including the rocket project, flying boat, sailplane project, and the microair vehicle project. A catered lunch was served.

Wives of the Pioneers were invited to tour the Boal Mansion Museum and Christopher Columbus Chapel and visit the specialty shops at the historic Boalsburg Village with lunch at Duffy's Tavern.

The 60<sup>th</sup> reunion of the Pioneers will be held during the summer of 2004 in conjunction with the University's Alumni Reunion weekend.

## In Memoriam

**Clinton Howard (Fritz) Fitzgerald** (B.S. 1943) passed away November 5, 2002. In 1943, he received a bachelor of science degree in mechanical engineering (with an Aero option) from Penn State and was one of the original Aerospace Engineering Pioneers. In 1954, he received a bachelor of science degree in electrical engineering also at Penn State. He was a retired associate professor of engineering research at the Applied Research Laboratory here at Penn State. His wife of 58 years, Emagene Fitzgerald, survives.

**William B. Anderson** (B.S. 1965) passed away July 6, 2002, at his home in Bryn Mawr, PA. For the past 20 years, Anderson worked as a research associate at the University Museum of Archaeology and Anthropology at the University of Pennsylvania. He spent four seasons excavating in Lebanon and published numerous articles related to his work. His wife of 37 years, Jean Jachen Anderson, survives.

**William Likens Brown IV** passed away January 8, 2003. Bill studied mechanical engineering at the Pennsylvania State College. A pioneer in model-aircraft aviation, he built the first practical gasoline-powered model aircraft engine in 1930, while he was attending high school. At the 1933 National Championship Model Plane meet, the model aircraft powered by the Brown gasoline engine went on to sweep every major category in the competition, revolutionizing a sport in which models had been powered by rubber bands. He later created Campus Industries to achieve his dream of developing the first carbon-dioxide engine which he successfully designed and built in 1942 (for small model aircraft). The current Brown Junior Motors, Inc. was established in 1968 to manufacture carbon-dioxide engines. He was elected to the Model Aviation Hall of Fame and to the Free Flight Hall of Fame of the National Free Flight Society in 1979. A master machinist, he was employed during his early years at Leeds and Northrup, the Franklin Institute in Philadelphia, and the Ordinance Research Laboratory (now the Applied Research Laboratory). He built the wind tunnel balance for the mechanical engineering department at Penn State that was subsequently adopted by Aeronautical Engineering.

---

### COLLEGE OF ENGINEERING

#### *Penn State Engineering Society*

Alicia Cole-Quigley  
Joshua Geiple  
Philip Johnson  
Rebecca Rosenberg

#### *Engineering Excellence Scholarship*

Ericka Noonan

# Undergraduate Scholarship/ Award Recipients (continued)

## COLLEGE OF ENGINEERING

### *A. & M. Gasche Scholarship*

Jamie Browne

### *H. Thomas and*

### *Dorothy Willits Hallowell Scholarship*

Daniel DiCara

Brian Swartz

Rebecca Thomas

### *Huck International Scholarship*

Patrick Garrett

### *C. D. Kearns Scholarship*

Matthew Garrison

### *Paul Morrow Scholarship in Engineering*

Rebecca Hoffman

### *Vollmer-Kleckner*

### *Scholarship in Engineering*

Paul Smidansky

---

## GRADUATE STUDENT FELLOWSHIP/ AWARD RECIPIENTS

### *FEGR, College of Engineering Fellowship*

Kathryn Fisher

Jason Petrie

Benjamin Welander

### *James Marley Fellowship*

Joshua Cameron

### *NASA GSRP Fellowship*

Hans Desmidt

### *NSF Graduate Fellowship*

Tracy Fritz

Nathan Grube

Matthew Moffatt

### *RCOE Fellowship*

Jason Petrie

### *Sloan Fellowship*

Vernecia McKay

### *Weiss Fellowship*

Brendon Malovrh

**Dustin Martin**, an aerospace engineering senior, is a member of the Penn State Icers hockey team. The Icers won their fourth straight ACHA National Championship in March 2003. Dustin plays Center and wears #17.

**Jose Palacios**, (B.S. 2003) senior captain of the Penn State men's gymnastics team, won gold on parallel bars with an 8.8000 at the West Point Open competition. He also finished in a tie for second on floor (8.880) and eighth on high bar (8.4500). Palacios excels not only in gymnastics, but also in the classroom. Palacios received the Eric A. Walker Award presented annually to the student who has contributed most to enhancing the reputation of the University through extra-curricular activities. Walker was president of the University from 1956-1970. The team went on to become the 2003 Big Ten Champions.



**Thomas M. Przybysz II**, (B.S. 2002) of Wheeling, WV, was the aerospace engineering student marshal for 2002. Tom is attending graduate school at the West Virginia University of Medicine.

**Kelly Corfeld**, (M.S. 2002) won the American Helicopter Society's (AHS) regional Robert L. Lichten competition. The award recognizes outstanding technical papers and research by an AHS member who has never presented a paper at a technical meeting before. Kelly's presentation was titled "Computational Analysis of a Prototype Martian Rotorcraft Experiment."

**Hideaki Yamato**, (Ph.D. 2003) was awarded the John V. Breakwell Student Travel Award by The Space Flight Mechanics Committee of the American Astronautical Society. The award was presented at the 13<sup>th</sup> AAS/AIAA Space Flight Mechanics Meeting, Ponce, Puerto Rico.

## Faculty & Staff

### DEPARTURES

**Kristie Kalvin** left her position as undergraduate program staff assistant in March 2002 and joined the staff in the Senior Vice President for Finance and Business office. Kristie had been in the Department for two years.

**Carol Little** left her position as accounting clerk in February 2003 to join the Huck Institute of Life Sciences. Carol had been with the Department for 12 years.

### ADDITIONS

**Janice Sherer**, undergraduate program staff assistant, joined the staff in April 2002. Janice has already become very popular with the undergraduate students with her assistance in various advising issues.



## Congratulations on the New Additions

Congratulations to Joe and Kimberly Horn on the birth of their daughter, Katherine Marian Horn (Kate). Kate was born July 2, 2002, and weighed in at 7 lbs., 4 oz. The couple also has a son Samuel Woofter Horn. Joe has been with the Department since July 2000.



Congratulations to Mike and Catherine Cohan Micci on the birth of their first child, a daughter, Sofia Cohan Micci, born May 31, 2002. Sofia weighed in at 5 lbs., 12 ozs. Mike has been with the Department since January 1981 when he started as an assistant professor.

## ROTORCRAFT CENTER OF EXCELLENCE

### 2002 ROTORCRAFT CENTER HIGHLIGHTS

The past year at Penn State's Rotorcraft Center was filled with a head-spinning combination of technical research breakthroughs, exciting new educational initiatives, and good old Happy Valley fun "rotorhead" style!

The Rotorcraft Center continues to be a model of multidisciplinary and collegial interactions, involving 17 faculty members, approximately 30 graduate students, and 6 undergraduate research assistants from aerospace, mechanical, engineering science and mechanics, and the Applied Research Laboratory. Annual research volume again exceeded the \$1 Million mark – representing a healthy leverage of the \$600,000 core award from NRTC. Research projects sponsored by the Army Research Office (equipment upgrades, vibration control), Piasecki Aircraft (compound helicopters), Bell Helicopters (Fluidlastic dampers), Boeing Helicopters (senior design projects), NASA (active control of drivelines), Department of Defense, Lord Corporation (embedded blade lag dampers), NSF (rotor wake simulation), and NREL (tailored composite wind turbine blades) were all active this past year. Check out our Rotorcraft Center Webpage for additional details on our ongoing research programs. (<http://www.psu.edu/dept/rcoe/>). In addition, NRTC funding helped Professors Horn and Long start a new exploratory project on hand-launched semi-autonomous Rotary-Wing UAVs. Penn State continues to "lead the way" with innovations in educational programs. Our first-year seminar course "Hands-On Helicopters" continues to attract forty students per year. We had visits from the Life Lion Eurocopter Dauphin and the Life Flight Sikorsky S-76 helicopters this past year. Professor Joe Horn offered a new graduate course on Rotorcraft Stability and Control this Spring. This complements existing specialized graduate courses on Rotorcraft Aerodynamics (AERSP 504) and Rotorcraft Dynamics (AERSP 506). Even our graduate students have gotten into the act of creating new ways to teach future generations of rotorcraft engineers.

A thesis title from May 2003 reads, "The Development of Experimental Teaching Facilities for Rotorcraft Aerodynamics

and Dynamics." Boeing continues to sponsor a series of popular and successful senior design projects for Aerospace, Mechanical, Electrical, and even Computer Science students to sink their teeth into.

Rotorcraft Center faculty and students are putting the miles on those fleet cars, and adding to frequent flyer accounts by leaving campus to interact with our colleagues in government labs, industry settings, and at professional meetings around the country. Our faculty participated in a productive group trip to Sikorsky, in addition to trips to Lord Corp., Boeing in Mesa, NASA Ames, NASA Glenn, and even DLR in Germany and the Air Force Academy in Thailand! Our Rotorcraft Center hosted a number of VIP guests and seminar speakers throughout the year. NASA Chief Administrator Sean O'Keefe listened to Rotorcraft Center briefings and asked technology questions during an August visit to campus. We have also been actively engaged with Congressman Curt Weldon's initiative to strengthen the rotorcraft technology base and reverse a disturbing trend in reduced federal funding for rotorcraft R&D. Engineers visiting the Penn State campus for technical discussions, seminars, guest lectures, and recruiting included **Dan Podgurski** (B.S. 1966), from Boeing, **Greg Wright** (B.S. 1971) from Sikorsky, Steve Glusman (B.S. 1981 in Mechanical Engineering) from Boeing, Gordon Leishman from the University of Maryland, Bob Bill from the US Army, Andy Baker from the U.S. Navy at Patuxent River, Bruce Kothmann (M.S. 1992) from Boeing, Patty Stevens (B.S. 1988, M.S. 1990, Ph.D. 2001 in mechanical engineering) from Boeing and **Mark Dreier** (B.S. 1974, M.S. 1977) from Bell.

Rotorcraft Center graduates remain in high demand within the workforce. During this past year, Nittany Lions joined engineering teams at the U.S. Army at Langley, Agusta Aerospace, Bell Helicopters, Sikorsky Aircraft, Boeing Helicopters, Barry Controls, and ONERA.

Some key new facilities have come online during the past year. Our scale model driveline dynamics test facility is now operational and is being used to support multiple projects here on campus. Low cost high performance computing facilities continue to come online and play roles in our CFD and CAA research groups. Our active airframe control testbed is operational and has been used in one doctoral dissertation already. Work has begun in earnest on advanced flight simulators, new parallel computing clusters, and our hover test cell (donated by Boeing). In addition, we now own and operate a small fleet (5) of radio controlled helicopters for use in class instruction, AHS activities, and specific research projects.

Finally, our students and faculty continue to gain recognition for excellence in research, scholarship, and teaching. We had 3 Vertical Flight Foundation Scholarship winners, a Regional Lichten Award winner, three Best Paper Awards at the 2002 AHS Forum, and Professor McCormick received the prestigious honor of the AIAA F.E. Newbold Award for Life Achievement in VSTOL Technology. Roar Lions!

Well, over and out for this year from the Rotorcraft Center. Be sure to keep in touch, come visit whenever you get a chance.

## IHPCA

The Institute for High Performance Computing Applications (IHPCA) is still very active. The Institute performs research and instruction in parallel computing, visualization, and recently has been looking at software for mobile robots. Professor Lyle N. Long is the director, and there are five associate directors (Professor Morris from aerospace, Professor Anderson from chemistry, Professor Xu from mathematics, and Professors Plassmann and Raghavan both from computer science and engineering). Several members of the Institute recently received an NSF Education grant worth more than \$3 million to train graduate students in algorithms and applications that use particle methods (e.g. Monte Carlo, molecular dynamics, and quantum methods). This center is called CEMBA (<http://www.cemba.psu.edu/>) and is currently funding almost 20 graduate students. The graduate minor degree program in High Performance Computing also continues to be very popular. Since 1999, 26 students have been awarded the HPC Graduate Minor, and there are currently 33 students working on the degree. The students are from ten different departments and three different colleges at Penn State. For more information: <http://www.psu.edu/dept/ihpca/>.

## Center for Acoustics and Vibration

A newly refurbished anechoic jet noise facility has recently been developed within the Center for Acoustics and Vibration. The high-speed jet noise facility includes a 300-psig compressed air supply from a 2000 ft.<sup>3</sup> reservoir. The air supply allows testing of jet nozzles up to one inch in diameter at velocities up to Mach 1.5. A 200 kW electric heater will soon be added to the system to accommodate heated jet testing to jet stagnation temperatures of close to 1000° F. Presently, helium is mixed with air to simulate the properties of heated jets. A series of helium cylinders pressurized to approximately 2300 psig feed into a series of piping and valves. This design allows for control of pressure and mass flow as well as an adequate mixing length of the air and helium streams. A high-temperature plenum/muffler delivers the flow through the nozzle to the anechoic chamber which contains fiberglass wedges on all sides with wedge-to-wedge dimensions of 16.5 x 19.8 x 9.2 ft. The cut-off frequency of the chamber is approximately 125 Hz. The educator section of the chamber consists of an acoustically treated, high-temperature duct with an exhaust fan capable of moving over 25 lbm/s. Incidentally, in order to properly construct the inlet and exhaust sections of this facility, the 25,000 lb anechoic chamber first had to be moved approximately ten feet.

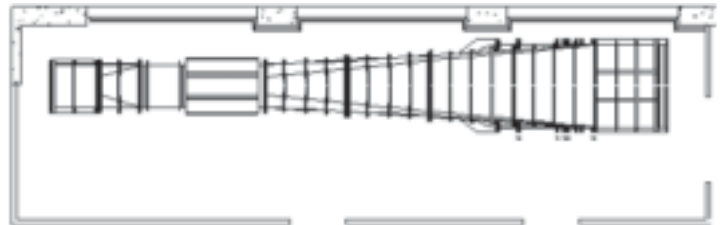
The facility is instrumented with a microphone array consisting of four to six condenser microphones allowing measurement of jet spectra and directivity patterns. Various flow measurement capabilities also exist including mean pitot pressure and temperature probes, hot-wire probes, and optical turbulence measurement devices. The data acquisition system consists of a personal computer with LABVIEW software and a National Instruments high-speed analog-digital board capable of acquiring four channels simultaneously at rates up to 300 kHz.

Motorized and programmable traversing mechanisms are also available. Current experiments involve round and non-axisymmetric high-speed jet nozzles and acoustic and fluid dynamic measurements. In addition, a small model gas turbine engine has also recently been tested in the facility. Current support includes grants from NASA Langley and the Strategic Environmental Research Development Program.

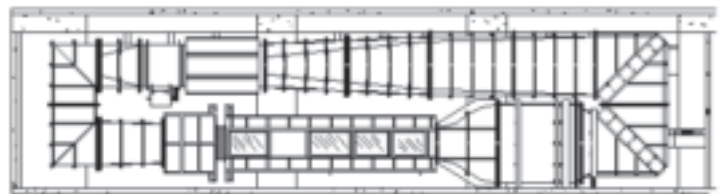
## Penn State's "New" 2' x 3' Low-Speed Wind Tunnel

Under the supervision of Rick Auhl, research assistant/laboratory supervisor for Aerospace Engineering, a number of students have been assembling a new mid-sized 2' x 3' wind tunnel. Rick has some experience in this area since he began his career at Penn State in the late 80s as the coordinator for the construction of the 3' x 5' multi-purpose wind tunnel located in the Academic Projects Building. The new wind tunnel is located at the north end of Hammond building in room 8, just below the Engineering Dean's office. The Department purchased two-thirds of the new wind tunnel from the University of Southern California in the summer 1999. Hence our current tunnel name "the California Wind Tunnel." After waiting over a year to obtain a space large enough to hold the new wind tunnel, some redesign was needed to fit the USC tunnel components into the new space. Brian Kane, a 1998 graduate of our Department, completed most of the redesign before he left in spring 2000 to take a job as a wind tunnel engineer in southern California. Some of the major tunnel modifications made by Penn State included a complete redesign of the fan and motor support stand, the removal of more than 21 inches of tunnel circuit height, and the addition of a noise abatement muffler just after the fan section.

*Top View and Side View drawings of the New Low-Speed Wind Tunnel*



*Room 008 Ground Level Hammond Building (Top View)*



*Room 008 Ground Level Hammond Building (Side View)*



Steady progress has been made over the past several years, despite the sporadic schedules of the part-time students involved. Although much of the tunnel was purchased as completed sections, Penn State students had to build and install the muffler, the last 20 feet of the upper diffuser, two large corner sections, the rapid expansion, and the settling chamber. It is estimated the final cost of this facility will reach nearly \$200,000.

Dr. Dennis McLaughlin, department head, describes this wind tunnel as “a great opportunity for our growing student enrollment to get experience with a very high quality research facility.” The twenty-five year old tunnel was a proven laboratory workhorse at USC, and will no doubt continue to serve the Penn State students equally well for another twenty-five years. The exceptionally long test section is particularly useful for experiments such as wake or extended boundary layer studies.



(Left): Inside the test section: A Micro-UAV Engine  
(Right): Inlet side of the test section and lower half of upper diffuser

The primary use of the wind tunnel will be for undergraduate instruction in the Aerospace 405W laboratory course, but it will also be made available for graduate and undergraduate thesis work. The tunnel has already been run in an open-circuit configuration to acquire meaningful data on “dandelion-like” seed dispersion patterns, and to verify a graduate student’s computer model predictions for a small UAV propeller. Just before “press time” the tunnel has been completed, and will be in full operation by the time classes start in the fall.

## Ground Effect Flying Boat

The Ground Effect Flying Boat is a project that started at Penn State over five years ago involving a multitude of undergraduate students in senior aerospace lab courses with the goal of investigating the influence of ground effect on low-flying aircraft. The design teams undertook the project intending to develop a full-scale, powered vehicle capable of carrying two passengers. Over time the design has been modified because the complexity of the original vehicle decreased the feasibility of accomplishing substantial progress within such short time periods. An independent study course was created to allow a team of students to work on the project for an extended period of time. While small design and fabrication tasks are still completed during the senior aerospace lab courses, the majority of the engineering is completed by the flying boat team. The team’s current design is for a recreational vehicle that will be towed behind a speedboat. It is envisioned that the Penn State flying boat will fit a new recreational market

competing with towed water sports, such as water skiing and parasailing, and self-propelled watercraft.

What is ground effect? A vehicle is said to be flying in ground effect when it is flying relatively close to the ground or water. An aircraft is generally considered to be in ground effect when the height above the ground of the trailing edge of the wing is less than half of the wing’s span  $h < b/2$ ,  $b = \text{span}$ . The condition of ground effect occurs naturally, yielding an increase in the lift of a vehicle while simultaneously reducing the drag and thereby increasing fuel efficiency of the aircraft engine. While flying close to the ground, air circulation due to vortex generation creates a cushion of air under the wing allowing for a drastic increase in the amount of lift that a vehicle can generate. Research seeks to exploit this benefit of increased lift to drag ratio that is obtained when the aircraft operates in ground effect.

The design effort initially specified a vehicle with a 35-foot wingspan and 25-foot length. The wings had an aspect ratio of 2.5:1. The fuselage of the vehicle had a tapered shape similar to conventional aircraft, and had a single vertical stabilizer and a single horizontal stabilizer as well (see adjoining Figure 1). The vehicle’s power plant employed a ducted fan, pusher type propeller mounted directly above the centerline of the fuselage ahead of the horizontal stabilizer. The aircraft carried a pilot and a passenger in a canopied cockpit at the nose of the vehicle. Mechanical flight controls provided the control inputs to the ailerons, elevators and rudder control surfaces. The vehicle’s design gross weight was approximately 2,000 pounds.



Fig.1. Conceptual drawing of the original vehicle design

This concept continued to evolve over a five-year span based on the work of several undergraduate student design teams. Each year the students are led by a graduate student teaching assistant, with Professor Dennis McLaughlin providing overall coordination. To date these graduate students have been **Dean Coulson** (B.S. 1996); **Tim Swan** (B.S. 1997, M.S. 2000); **Bill Posnett**, (B.S. 1968 and graduate studies, 1999, 2000); **Tom Urie**, (B.S. 2000; M.S. 2002) and **Peter Germanowski** (B.S. 2001, M.S. 2003). The difficulties found in the construction of the original design warranted a decision to postpone the powered vehicle for a new, less intricate model. The new vehicle increases simplicity by foregoing the fuselage entirely in favor of a flying wing concept, in addition to removing the power plant components of the original configuration. The new application shifts from a powered vehicle intended for transportation to a vehicle used in a recreational capacity, competing with the jet ski and parasail water sport markets. The new design retains the ability to demonstrate advances in optimizing a vehicle for operation in ground effect.

(Continued on page 12)

Barnes McCormick, Boeing Professor Emeritus, sings along to "Fight On, State" at a combined event of the Aero Pioneer 58<sup>th</sup> Class Reunion and a surprise 75<sup>th</sup> birthday celebration for Barney honoring his outstanding service and accomplishments in the aerospace engineering profession.



**Graduate Fellowship Winners**  
 Front Row: - L to R - Vernecia McKay, Tracy Case, Katy Fisher  
 Back Row: - L to R - Matt Moffatt, Nathan Grube, Jason Petrie, Dr. George Lesieutre



Dr. McLaughlin drives the boat while George Gurney operates the radio controls of the Flying Boat during field tests



Becky Hoffman rescues Flying Boat



**Aerospace Department Scholarship Winners**

Front Row - L to R - Pete Hammond, Ericka Noonan, Lisa Hazinski, Rebecca Rosenberg  
 Back Row: L to R - Dean Robert P. Panghorn, Blair Basom, Pat Garrett, Nick Baxter, Chris Scott, Anthony DeLullo, Adam Steele, Dr. Robert Melton



**Graduate Students at the Spring 2002 Graduation Reception at the Days Inn**  
 L to R – Vincent Vielfaure, Natalia Gimelshein, Roberto Sarjeant, Guillaume Bres,  
 Anthony Faulds, Vincent Tesson, Jean-Philippe Essert, Phuriwat Anusonti-Inthra



New faculty dress code as of October 31, 2002



**Fall 2002 Undergraduate Graduation Reception at the Days Inn**  
 L to R – Dan DiCara, Samantha Kahn,  
 Matt Ferringier, Renee Zlobik, Mike Ravenscroft,  
 Dennis Haerberle, Dan Silianoff, Bob Estocsin,  
 Jamie Landers, Bini Kadwa, Laura Campbell



**Undergraduate Students at the Spring 2002 Graduation Reception at the Days Inn**  
 Front Row: L – R – Jamie Johnson, Brock Golesich, Katy Fisher, Ryan Rudy,  
 Aaron Pressman, Morton Lee Back Row: L – R – Brendan Corrigan, Albert Koerner,  
 Christopher Masters, Thomas Przybysz, Shawn Brechbill, Joseph Mancuso, Stephen Repsher, Luke Cooper



*(Continued from page 9)*

This new design concept employs a NACA 4412 airfoil with a rectangular planform and an aspect ratio of 1:1. The design also includes endplates and pontoons mounted on the wing tips. The vehicle is designed to support a single pilot in a sling type jump seat that is located predominantly in the wing. The cockpit will be open, rather than the conventional cockpit employed by the original design. A horizontal stabilizer is located on its own supports above the wing, near the trailing edge of the wing. The elevon, at the rear of the wing, occupies approximately 15% of the wing chord and is split in two. The two-part elevon will provide pitch and roll control from a single control stick. This second-generation design is powered by tethering the vehicle to a motorboat and towing the vehicle on a lake surface.

**NOTE:** The elevons may become ailerons with the addition of a controllable horizontal tail surface. Then ailerons provide roll control only.

The second generation design experiments began with several preliminary design evaluation efforts that involved 1/8<sup>th</sup> and 3/10<sup>th</sup> scale models of the flying boat design. These models underwent testing in a variety of environments ranging from tethered wind tunnel tests to towed experiments conducted on a nearby lake. These experiments provided the first real insight into the performance of the second generation flying boat design as well as the potential problems facing the design.

The problem of most immediate concern appeared in both the tethered wind tunnel and lake experiments; an apparent instability surrounding the longitudinal pitching motion of the vehicle. In order to resolve this instability problem, the 1/8<sup>th</sup> scale model was subjected to comprehensive wind tunnel experiments using a six-component force balance to analyze the aerodynamic loading. This has become the topic of Pete Germanowski's master's thesis. Aside from the pitching moment instability problem, the 3/10<sup>th</sup> scale tethered test on the lake indicated two additional concerns: a lack of torsional rigidity within the NAW wing structure and a lack of buoyancy of the pontoons. These two problems are currently being addressed in the senior lab courses, specifically to redesign the main spar and revise the shape of the pontoons.

Due to the problems experienced during experimental testing, the team has decided to upgrade their engineering design and analysis, including detailed drawings of each model, prior to any fabrication. The current goal is to design the vehicle so that the center of gravity is located at the aerodynamic center, in order to improve the stability of the vehicle. The team's next step is to rebuild the 3/10<sup>th</sup> scale model including the aerodynamic analysis completed by Pete Germanowski, the new spar design, and the redesign of the pontoon structure. A new delta wing configuration is also undergoing conceptual design.

Operating the vehicle in a recreational capacity removes some of the burden on the design team. In this capacity the vehicle operates at low enough speeds and velocities to preclude meeting the Federal Aviation Administration guidelines for an experimental aircraft. Furthermore, the recreational nature of

the vehicle makes it easier to find venues to test larger scale models of the vehicle, while also allowing the vehicle to be operated by a layperson as opposed to requiring the expertise of a trained pilot. Finally, the recreational nature of the vehicle provides the project with an attainable goal of bringing the vehicle to the retail market and creating a cost effective and profitable design. The most important goal, however, has been achieved each and every year of the project. This is to give students some experience in the development process necessary to produce a design that can be taken to the market place. The project continues. Stay tuned for future progress reports.



*This picture shows current team members with the 3/10<sup>th</sup> scale model on one of the field test days. (Left to Right) Pete Germanowski, Jim Henry, Becky Hoffman, Rich Harrison and Brad Champion*

(Article by Christine Carpenter and Rich Harrison, members of the 2002-2003 Flying Boat Project team.)

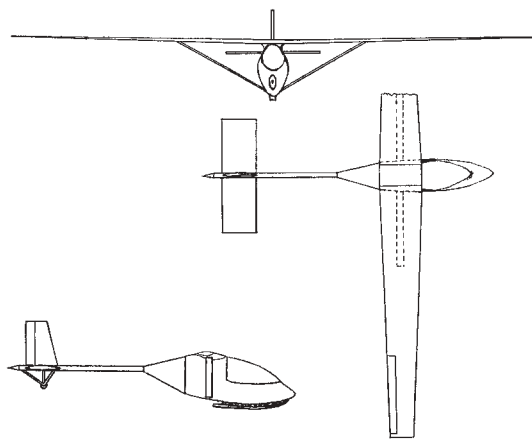
## News from The Sailplane Class



After having moved to the new sailplane lab in Hammond Building in fall 2000, the sailplane students have resumed work on the American Falcon kit. Despite the restricted space, the class work progressed well and by the end of the spring semester 2002, the Falcon-fuselage halves were finally permanently joined. The pictures below were taken during the evening of the final joining. Both halves fit together, and the result looks indeed like a fuselage.

The class has also progressed with fixing the structure of the Falcon wing. The original root rib exhibited some structural deficiencies during a load test. The students have removed that root rib and started building a new one according to the lay-up plan that was devised in the KISS-design reports a few years ago. The redesigned root rib will very likely be bonded into the wing by the end of this semester.

Another class project is the easy-to-build-sailplane design (see three-view below), which the class hopes to finish in one to two years. It is a single seat glider with a wingspan of 15 meters. The wing is going to have a fiberglass-epoxy D-tube, spar caps that are made out of prefabricated carbon rods, a fiberglass-epoxy spar web, and fabric covered ribs. The wing airfoil is the famous SM701. The fuselage is a steel-tube frame that will also be covered with fabric and the tailboom is going to be prefabricated carbon-fiber tube. The empennage will be a simple frame-structure that is covered with plywood and fabric. By now the theoretical design is advanced enough so that a group of students has started with the fabrication of the wing. The wing will be built positive without extensive molds. It is intended to also start with the construction of the fuselage and empennage this spring. Some theoretical work remains for the details of the fuselage and empennage.



*The easy-to-build sailplane design*

Last fall the class had another famous “rocket-glider contest”. The picture below shows the complete class after the frigid (we had our first snow showers) and sometimes successful completion of the task to launch a balsa glider with a model-rocket engine into the lower atmosphere and return it safely to earth in as much time as possible. The group picture also gives an impression of how this class has grown. Currently, the class has 34 students.



*The Fall 2002 Sailplane Class at Beaver Stadium*

**If you want to see what is going on in class,  
please check out our new website at:**

<http://www.psu.edu/dept/aerospace/sailplane/index.html>

## AeroGSA

The aerospace engineering graduate student association (AeroGSA) was founded in 1994 to provide information to prospective students, address the concerns of current students, and promote productive communication between students, faculty, and staff in the aerospace engineering department. For the 2002-2003 academic year, AeroGSA was led by Silvio Chianese - president, Kathryn Fisher - vice-president, Eric Hathaway – treasurer, and Erin Pursell - secretary. In the fall semester, AeroGSA assisted the Department in planning and conducting the orientation for new and returning students. Also, the group sponsored a faculty and student luncheon to facilitate interaction between the groups. Members of AeroGSA were also instrumental in the success of the First Annual Aerospace Engineering Career Fair. In the spring semester, AeroGSA held a feedback session for graduate students so they could discuss the positive and negative experiences they have had in the department. This information will be used to help guide decisions concerning graduate students in the future. Also, the group helped organize and run the annual prospective graduate student recruitment weekend, and participated in the annual Department picnic held at Sunset Park.

## AIAA

The Penn State University American Institute of Aeronautics and Astronautics (AIAA) student branch enjoyed a successful year. The organization held numerous educational and social activities, along with monthly meetings. Dr. George Lesieutre, the director of graduate studies in the aerospace engineering department, gave an informative presentation and answered questions with a panel of graduate students at one meeting and, at another, aerospace students spoke about internship and co-op experiences that they have had. In November, the branch, along with the Aerospace 410 Propulsion class, took an overnight trip to Pratt and Whitney Aircraft Engines in East Hartford, CT, and enjoyed a day-long tour of the facility. The trip was sponsored by the aerospace engineering department. The student branch also co-sponsored, with Sigma Gamma Tau Aerospace Engineering Honor Society, the first Penn State Aerospace Engineering Career Fair on December 4 and 5 in

Kunkle Lounge. The fair was very successful, bringing together 8 employers and approximately 70 students.

In March 2003, AIAA Distinguished Speaker John Swihart gave a presentation titled, "Supersonic Transport: Some Design Considerations." The meeting was very well attended. In April, student members traveled to the University of Maryland for the AIAA Mid-Atlantic Regional Student Conference where three students from the Department presented papers. The branch continues to hold social activities, such as movie nights and the spring picnic.



AIAA students enjoying a trip to Pratt and Whitney in Connecticut

**Student Branch Executive Board 2002-2003**

- Dr. Robert G. Melton, Advisor . . . . . rgmelton@psu.edu
- Blair Basom, Chair . . . . . bjb242@psu.edu
- Dave Maniaci, Vice Chair . . . . . spiderman@psu.edu
- Josh Geiple, Treasurer . . . . . jsg187@psu.edu
- Nick Baxter, Secretary . . . . . srh163@psu.edu
- Jamie Szmodis, Social Chair . . . . . jms611@psu.edu

*American Helicopter Society*

**AHS (Fall 2002 – Spring 2003)**

- President: **Michael Duffy**, (Undergraduate Aerospace),  
 . . . . . mjd267@psu.edu
- Vice President: **Ron Davis**, (Graduate Aerospace),  
 . . . . . rad151@psu.edu
- Treasurer: **Jason Hines**, (Graduate Mechanical),  
 . . . . . jah299@psu.edu
- Secretary: **Jason Petrie**, (Graduate Aerospace),  
 . . . . . jsp190@psu.edu
- Faculty Advisor: **Dr. Ed Smith**, (Professor Aerospace),  
 . . . . . ecs@coe.psu.edu



AHS made a name for itself during the 2002-2003 academic year. The chapter started the 2002 fall semester with relatively few members, but over 60 people were in attendance at the final meeting of the semester, December 2002.

Guest speakers included Steve Glusman, director of engineering for Boeing's U.S. Army Unmanned Systems, Andrew M. Baker, flight test engineer, Rotary Wing Ship Suitability, and Greg Wright, handling qualities lead for the Sikorsky S-92 program. Each of the speakers informed attendees of current real world projects in the rotorcraft field. A field trip to Rotorfest in West Chester, PA, and a fly-in from the Hershey Medical Center LifeLion Helicopter, allowed students to see operational rotorcraft up close.

AHS held exciting meetings with a flying helicopter competition with prizes and great food. A flight simulator was brought to the December meeting so that students could get the feeling of flying a real helicopter.

*Sigma Gamma Tau*

Sigma Gamma Tau was founded on the campus of Purdue University in 1953, "to offer appropriate recognition to persons of superior scholarship, outstanding character, and professional achievement in the field of Aeronautical Engineering." Since 1953, the society has grown from 14 to 50 collegiate chapters and from 1,900 to more than 14,000 initiated members.

The objectives of Sigma Gamma Tau are: "to recognize and honor those individuals in the field of Aeronautics and Astronautics who have, through scholarship, integrity, and outstanding achievement, been a credit to their profession. The society seeks to foster a high standard of ethics and professional practice and to create a spirit of loyalty and fellowship, particularly among students of Aerospace Engineering."

Undergraduate students who are enrolled in an accredited aerospace curriculum and are in the upper one-third of their senior class or upper one quarter of their junior class are eligible to be inducted into the society. After the scholastic requisite is fulfilled, selection is then based on a high moral character and a strong interest in aeronautics and/or astronautics.

The Sigma Gamma Tau 2002 Spring Induction Banquet was held at the Autoport Restaurant. Twenty-three new members were inducted. Sigma Gamma Tau was honored to have Dr. James Pawelczyk as the guest speaker, with his speech titled "What Price a Martian? Human Limits to Exploring the Red Planet."

Sigma Gamma Tau also initiated a tutoring program in fall 2002. The program consisted of ten graduate and undergraduate students who each volunteered for an hour per week. The tutors were available in the aerospace student lounge to give students the opportunity to ask questions concerning any course. It is expected that this program will expand in upcoming semesters to provide a large support group for all aerospace engineering students.

This year, the faculty advisor and officers are:

Advisor: **Dr. Kenneth S. Brentner** . . . . . ksbrentner@psu.edu  
President: **Christi Carpenter** . . . . . cxc594@psu.edu  
Vice President: **Mike Safko** . . . . . AstronautMike@psu.edu  
Treasurer: **Pat Garrett** . . . . . pdg123@psu.edu  
Secretary: **Lisa Hazinski** . . . . . leh140@psu.edu

## First Annual Aerospace Engineering Career Fair - December 4-5, 2002

Members of the Penn State chapters of AIAA and SGT planned and executed the first Aerospace-specific Career Fair in the Kunkle Lounge on University Park campus. Even though it was the first Aerospace Career Fair, representatives from several companies, graduate programs, and research laboratories were in attendance. The recruiters came from Piasecki Aircraft Corp., Essington, PA; Naval Research Laboratory, Washington D.C.; Science Applications International Corp., King of Prussia, PA; MIT Lincoln Laboratory, Lexington, MA; Computational Engineering International, Inc. and Von Karman Institute Graduate Program, Apex, NC; as well as Penn State's own Applied Research Laboratory and Aerospace Graduate Program. At the conclusion of the career fair, they commented on how smoothly and professionally the event was run. Due to the success of the career fair, this event will be continued in future years to benefit all aerospace engineering students.

It was an excellent opportunity for aerospace engineering students to speak with various companies within the industry, and many students took advantage of this opportunity. Approximately 80 students visited the recruiters and several arranged for interviews the following day at the MBNA Career Services Center.

Among the visitors were several alumni of our program: Todd Klaput of SAIC, Linda Hackett of MIT Lincoln Laboratory and Andrew Greenjack of Piasecki.

*The students hope to build and improve on this first endeavor. If anyone has an interest in participating in fall 2003, please contact the Department.*

Co-Chairs . . . . . Katy Fisher & Renee Zlobik  
Treasurer . . . . . Dennis Haeberle  
Registration Chair . . . . . Dan DiCara  
Rachel Larson  
Infrastructure Chair . . . . . Silvio Chianese  
Ben Eastmond  
Publicity Chair . . . . . Blair Basom  
Rachel Larson  
Mike Safko (web master)  
Alicia Cole-Quigley  
Reception Chair . . . . . Lisa Hazinski  
Christi Carpenter

## Short Courses Taught By PSU Aerospace Professors

**Barnes W. McCormick**, Boeing Professor Emeritus, offered a short course titled "**Rotary Wing Technology**." The course was held at Penn State in August and was the 17<sup>th</sup> consecutive year it was offered. The enrollment, a little down this year at 17 compared to normal enrollments of approximately 30, was probably due to economic conditions. In addition to U.S. attendees from government and industry, there were two attendees from Canada and one from Italy. There were six lecturers covering aerodynamics, dynamics, composites, acoustics, and stability and control. Next year, the course will be offered from August 18-22, 2004.

### AEROSPACE ENGINEERING SPECIAL SEMINARS

**Dr. George Karabadzhak**, head of laboratory in TxNIMASH. "UV-imagery and Spectrometric Observations Onboard the Russian Mir and International Space Stations," January, 21, 2002.

**Dr. Takeru Yano**, Hokkaido University, Japan. "Nonlinear Wave Phenomena Caused by the Resonant Gas Oscillations in Closed Tubes," February 19, 2002.

**Lt. Col. James D. Thorne**, United States Air Force, "A Series Solution of the Lambert Problem," February 28, 2002.

**Mr. James Hargrave**, 2002 Outstanding Engineering Alumnus, "What I Never Knew I Learned in College—A Career in Systems Engineering and Management," April 15, 2002.

**Prof. T.S. Ramamurthy**, Indian Institute of Science, Bangalore India, "Role of T-Stress in Dynamic Fracture," April 29, 2002.

**Dr. Gordon J. Leishman**, University of Maryland, "Aloft on Whirling Blades – Technology Milestones in Early Helicopter Developments," September 26, 2002.

**Dr. Bruce Kothmann, Sr.**, technical specialist, Boeing, Philadelphia, "Helicopter Handling Qualities: Experience and Insights from the RAH-66 Comanche Program," November 15, 2002.

**Dr. Mark Nixon**, U.S. Army, Langley Research Center, "Aeroelastic Testing of a 4-Bladed Semi-Articulated Soft-Inplane Tiltrotor," November 15, 2002

**Mr. Steven I. Glusman**, director of engineering for Boeing's Unmanned Systems, "Unmanned Vehicles," December 12, 2002.

**Mr. Greg Wright**, Senior Engineer, Sikorsky Aircraft, "The Sikorsky S-92 Helibus Project," February 5, 2003.

### Penn State Engineering Alumni on Award Winning Sikorsky S-92 Helicopter development team

In February, Sikorsky Aircraft of Stratford, CT, was selected by the National Aeronautic Association (NAA) to receive its prestigious 2002 Robert J. Collier Trophy, honoring the all-new S-92 helicopter as "the greatest achievement in aeronautics or astronautics in America" in 2002. The S-92 is only the third helicopter recognized in the 70-year history of the Collier Trophy, which is regarded worldwide as the most prestigious award in the aerospace industry. Sikorsky was chosen for designing, manufacturing, testing, and introducing into service the S-92 helicopter, an aircraft that combines exceptional safety and performance features to dramatically raise the standards for helicopter travel. On June 10, Sikorsky accepted the Collier Trophy at Ceremonies held in Washington, D.C.



*The S-92 during flight tests in West Palm Beach, FL*

A number of Penn State Alumni at Sikorsky have participated in and played key roles in the S-92 helicopter development program. **John Palumbo** (B.S. 1987, M.S. 1989 ME) currently holds the position of chief engineer and is responsible for all engineering aspects of the program. The Aerospace Department has been well represented on the program, in particular, the Class of 1971. **Bob Blauch** (B.S. 1971) now serves as Deputy Systems Engineer and has been involved with the S-92 since its inception in the early 1990s. He has been involved in aircraft attributes, trade studies and the assessment of customer requirements for performance and operating cost. John and Bob were among the team of Sikorsky representatives present at the Collier Trophy award ceremony. **Greg Wright** (B.S. 1971) and **John Occhiato** (B.S. 1966) were key participants in the three-year flight development phase and were heavily involved in evolution of the final aircraft configuration. Other members of the design team have been **Dave Avampato** (B.S. 1981) in the area of structural loads analysis, **Jeff Purse** (B.S. 1971), main rotor design, **Jon Davis** (B.S. 1964) and **Alan Egolf** (B.S. 1971, M.S. 1973), aerodynamic modeling and performance analysis, **Tom Harman** (B.S. 1971), airframe design and **John Jones** (B.S. 1961), aircraft specifications and cost estimates. **Joe Belisari** (B.S. 1999) was involved in component fatigue substantiation. **Karl Scherer** (B.S. 1991) and **Tim Trainer** (B.S. 1976) are members of the flight test team conducting ongoing FAA certification flight testing at the Sikorsky Development Flight Center in Florida. **Terry Fahr** (B.S. 1971) is a member of the FAA certification team.



*John Palumbo (B.S. 1987 M.S. 1989 ME) and Bob Blauch (B.S. 1971)*

**Ralph A'Harrah** (B.S. 1955) is Manager for NASA's Aviation Safety Program at NASA Headquarters in Washington, D.C., where he has been a member of the technical staff since 1989. Ralph served as the NASA technical liaison to the National Research Council's Committee on the Effects of Aircraft-Pilot Coupling on Flight Safety and he is currently a member of the Aviation Safety Reporting System Subcommittee of the Aero-Space Technology Advisory Committee. He is also a member of the Joint FAA/NASA Aviation Safety Working Group.

**Julien Bernard** (Ph.D. 2002) a research engineer in the Acoustics group at Thales Underwater Systems, France, has been working on the design of hull mounted passive sonar arrays for submarines and on the development of modeling tools for array self noise assessment.

**Douglas Barron** (M.S. 1993) is at Lockheed Martin working in the Acoustics Group. Doug is working on the modernization program for the C-5 cargo airplane and is doing the acoustics work for two phases: the Avionics Modernization Program (AMP) and the Reliability Enhancement and Re-engineering Program (RERP).

**Alan Beckwith** (B.S. 1972) is a member of the Screen Actors Guild and the American Federation of Television and Radio Artists. He is currently with Sony Pictures for Columbia and Tri-Star distribution.

**Rebecca (Squires) Bryant** (Ph.D. 1996) recently joined United Technologies Research Center where she is performing research and development on a variety of aeroacoustics problems.

**Steven A. Christensen** (B.S. 1988) recently received a promotion at Northrop Grumman Electronic Systems sector in Maryland. He is now the head of mechanical engineering responsible for structural integration of aircraft modifications where they modify aircraft for a variety of government purposes. Steven is currently pursuing his structural DER with the FAA.



**Paulo Carvalho** (B.S. 1997) is a first officer with the Custom Air Charter Company and is flying King Air and Piper Cheyenne planes from the Philadelphia NE airport. Custom Air Charter is located in Warrington, PA.

**Louis R. Centalozza** (B.S. 1995, M.S. 1998, Ph.D. 2001) is now employed at the U.S. Army Aviation Applied Technology Directorate (AATD) in Fort Eustis, VA. He is busy at work now that the LODS flight test program has started. He has been on four Black Hawk flights so far with more flights coming soon.



*It's a small world: When Lou Centalozza moved to Williamsburg, VA, he found that his next door neighbor was another Penn State Alumnus, David Piatak. Lou is pictured on the left with his wife Brandy and Dave (right) with wife Mary and children Hannah and Joshua.*

**Chris Davis** (B.S. 1990, M.S. 1993, Ph.D. 1997) recently commemorated 5 years with the Boeing Company in Seattle, WA. He is currently functioning as a lead engineer in the Structures Technology Group of Phantom Works and was recently selected for the Boeing High Potential (HIPO) Program (an accelerated professional/personal growth program that provides leadership and networking opportunities in both the technical and managerial roles). Apart from keeping busy at work, Chris, his wife Angela (B.S. Marketing 1991), and their daughter, Hannah, have recently been blessed with the arrival of a new baby girl, Rachel Lynn Davis, on May 8. Rachel weighed in at 8 lbs., 7 oz.

**Dan DiCara** (B.S. 2002) is now working at the Massachusetts Institute of Technology Lincoln Labs in Boston, MA. Dan is doing a lot of programming and is hoping to use more of his aerospace knowledge in the future.

**Mike Doty** (M.S. 1998, Ph.D. 2002) recently joined the NASA Langley Research Center's Supersonic Jet Noise Laboratory as a National Research Council, Post Doctoral Fellow.

**Greg Douglass** (B.S. 2000) and fellow grad **Tracie Tepke** (B.S. 1994) took the latest V-22 Osprey aircraft down to Fort Bragg, NC for some para drop testing. The testing went well and all planned test points were completed ahead of schedule. Greg works for Bell Helicopters.

**Mark Dreier** (B.S. 1974, M.S. 1977) works at Bell Helicopter Textron in Ft. Worth, TX, as a staff engineer in the flight simulation department. Mark has worked at Bell since 1982, spending more than ten years in the Research Group. He is also an adjunct instructor of helicopter aerodynamics at the University of Texas at Arlington.



*Mark Dreier returns to "Old State" to teach Aersp 407.*

**Scott Glaser** (B.S. 1999, M.S. 2002) completed his M.S. degree and married Kelly Bott (B.S. 2000) in the same year. Informed sources recall "notes" being left in grad mail boxes...

**Kiran Govindswamy** (M.S. 1992, Ph.D. 1995) works for FEV Engine Technology in Auburn Hills, Michigan. FEV is a German owned automotive consulting company with technical ties to the Aachen Technical University (Germany). At FEV's North American Technical Center, he leads a group of engineers conducting vehicle NVH (noise, vibration, harshness) consulting programs with a focus on refining the powertrain-induced noise/vibration behavior in the vehicle. In addition to technical supervision of the ongoing programs, he is responsible for business development at FEV in the area of vehicle NVH. Kiran and his wife, Prabha, have one daughter, Avani, who was born on July 21, 2002.

**William (Bill) Guzik** (B.S. 1979) President of Sound Technology, Inc., and captain of the Sharks of the Nittany Hockey League, accepted the 2002 Outstanding Technology Company award given by the PA Centre County Chamber of Business and Industry. Sound Technology received the technology award by demonstrating its significant impact on the medical ultrasound industry and its excellence in providing medical ultrasound technology for the betterment of patients around the world. Bill accepted the award on behalf of STI's 115 employees. "I'm pleased and honored to accept this award from our fellow chamber members on behalf of our founders, Farley Peechatka and Matt Spigelmyer, our outstanding employees, and our global customers. It is great to be able to implement our company mission to apply science and technology to improve worldwide health and well being while also being recognized by our peers as an excellent company." Sound Technology, a subsidiary of Analogic Corporation, continues to experience growth in domestic and international markets. Founded in 1987, STI continues to expand and develop strategic supplier relationships with many of the world's leading manufacturers of ultrasound equipment.

**Tom Ivanco** (B.S. 1999, AHS president) completed US Army Apache flight training at Ft. Rucker. Tom works at NASA Langley Research Center and is presently deployed in Kosovo.

**Matthew Kalas** (B.S. 1997) recently graduated from law school in Chicago. Having passed the Illinois bar exam, Matt will soon be a practicing lawyer with an Aerospace Engineering degree.

**Jonathan Keller** (B.S. 1995, M.S. 1998, Ph.D. 2001) is now working for the U.S. Army Aviation and Missile Command in Huntsville, AL. He is involved with health monitoring and vibration control programs.

**Mark J. Keller** (B.S. 1990) received a M.S. in aeronautical engineering from the Air Force Institute of Technology in March 2001 and was promoted to the rank of major, U.S. Air Force. He currently serves as chief of the Control Theory and Optimization Branch, Air Vehicles Directorate, Air Force Research Laboratory, at Wright-Patterson Air Force Base. Keller heads a research team involved in the control of manned and unmanned aircraft.

**Kevin Kinzie** (M.S. 1991, Ph.D. 1995) now leads the Jet Noise Laboratory at NASA Langley Research Center, Aeroacoustics Branch.

**Todd Klaput** (B.S. 1994, M.S. 1998) is working for SAIC in Philadelphia working on a variety of high speed vehicle development projects. Todd's work takes him to numerous wind tunnel facilities at some of the outstanding government labs.

**Gregory Malejko** (B.S. 1985) is a senior aerospace engineer with the aeroballistics team, Fire Control & Software Engineering Division for the U.S. Army Armament Research, Development and Engineering.

**David Mehr** (B.S. 1988) is currently a pilot with Southwest Airlines in Phoenix, AZ. Before that David spent nine years in the U.S. Air Force where he flew the F-15C and worked as an instructor pilot on the T-38. David and his wife have two children, 1-year-old Cameron and 3-year-old Madison, and reside in Mesa, AZ.

**Juan Carlos Negron** (B.S. 2000) is working as a civilian for Naval Air Systems Command (NAVAIR) Fleet Support Team located at the Marine Corps Air Station, Cherry Point, NC. Juan provides engineering support for the AV-8B Harrier Fleet and Naval Aviation Depot.

**Scott R. Parent** (M.S. 1994) has joined the General Electric Global Research Center as the project leader of Advanced Design Tools Technology, a multi-million dollar project supporting GE Aircraft Engines and Power Systems.

**David Piatak** (B.S. 1994) is a research engineer at the NASA Langley Research Center (see earlier photograph).

**Christopher Rabzak** (B.S. 1991) received a juris doctorate degree from Widener University School of Law in Wilmington, DE. He is currently pursuing a master's degree in business administration.

**Eric Schultz** (B.S. 1995) completed flight training in the T-37 last November and won the Top Stick award given to the best student pilot based on academic, simulator, and flying performance. He is now assigned to the 87<sup>th</sup> Flying Training Squadron (Red Bulls) at Laughlin AFB and will be flying the T-38 supersonic jet trainer.

**Lionel Tauszig** (M.S. 1998, Ph.D. 2002) is presently employed at Agusta Aerospace in Philadelphia, PA.



*Lionel Tauszig stands in front of a partially assembled AB139 helicopter.*

**Dr. K. Viswanathan (Vishy)** (Ph.D. 1991) is a member of the Aeroacoustics and Fluid Mechanics Technology group of the Boeing Commercial Airplane Company. He leads several projects for the development of jet noise reduction technologies. He is married to Nancy Gonlin (Ph.D. Lib 1993).

# Alumni Survey

This survey can also be completed on the web.  
www.aero.psu.edu

## Attention Aero Grads!

What are you doing now?

We would like to expand our Alumn & Alumnae Notes section. If you have recently changed jobs, or have had achievements in your career, married, or even retired, please write and let us know.

You can send your news by e-mail to [aerosp@psu.edu](mailto:aerosp@psu.edu), visit us on our web site at <http://www.aero.psu.edu> or write to us at The Department of Aerospace Engineering, 229 Hammond Building, Penn State University, University Park, PA 16802.

We look forward to hearing from you.

### 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: \_\_\_\_\_  
 Include email address on database? Yes  No  Email Address: \_\_\_\_\_

### Aerospace Department Curriculum

Now that you're away from us and in the workplace, please take a few moments to rate how our curriculum has prepared you for your career. This information will be used for accreditation purposes. In this accreditation process, program objectives are assessed from a variety of groups, including alumni. Your participation in this survey will help us improve our undergraduate curriculum for current and future students.

Each question will ask for an evaluation. Selecting the button marked "1" indicates that the curriculum did a poor job in meeting that objective. Selecting the "3" indicates that the objective was adequately met. A value of "5" means that the curriculum did an excellent job in meeting that objective. If you are unsure, select "N/A".

When you graduated from the Aerospace Engineering Department, how well were you prepared to:

- |  | low   | high |
|--|---|------|
| a. apply mathematical skills to solve engineering problems? . . . . .  | 1 . . . . . 2 . . . . . 3 . . . . . 4 . . . . . 5 . . . . . n/a |      |
| b. design and construct experiments? . . . . .   | 1 . . . . . 2 . . . . . 3 . . . . . 4 . . . . . 5 . . . . . n/a |      |
| c. design a system, component or process, integrating knowledge from relevant topics in aeronautics and/or astronautics? . . . . . | 1 . . . . . 2 . . . . . 3 . . . . . 4 . . . . . 5 . . . . . n/a |      |
| d. function on a multi-disciplinary team? . . . . .  | 1 . . . . . 2 . . . . . 3 . . . . . 4 . . . . . 5 . . . . . n/a |      |
| e. identify, formulate, and solve engineering problems? . . . . .  | 1 . . . . . 2 . . . . . 3 . . . . . 4 . . . . . 5 . . . . . n/a |      |
| f. appreciate the ethical and professional responsibilities of the engineering profession? . . . . .                               | 1 . . . . . 2 . . . . . 3 . . . . . 4 . . . . . 5 . . . . . n/a |      |
| g. communicate effectively? . . . . .  | 1 . . . . . 2 . . . . . 3 . . . . . 4 . . . . . 5 . . . . . n/a |      |
| h. understand the impact of engineering solutions in a global and societal context? . . . . .                                      | 1 . . . . . 2 . . . . . 3 . . . . . 4 . . . . . 5 . . . . . n/a |      |
| i. recognize the need for and then pursue life-long learning? . . . . .  | 1 . . . . . 2 . . . . . 3 . . . . . 4 . . . . . 5 . . . . . n/a |      |
| j. appreciate the significance of contemporary issues as they affect your professional life? . . . . .                             | 1 . . . . . 2 . . . . . 3 . . . . . 4 . . . . . 5 . . . . . n/a |      |
| k. use the techniques, skills, and modern engineering tools necessary for engineering practice? . . . . .                          | 1 . . . . . 2 . . . . . 3 . . . . . 4 . . . . . 5 . . . . . n/a |      |

l. apply knowledge in all subjects in Category I (below) or in Category II, and in some subjects in the other category? (**Category I:** aerodynamics, aerospace materials, structures, propulsion, flight mechanics, and stability and control)

(**Category II:** orbital mechanics, space environment, attitude determination and control, telecommunications, space structures, and rocket propulsion)

	low	high
1. . . . . 2. . . . . 3. . . . . 4. . . . . 5. . . . . n/a		

How could we better prepare students to satisfy these objectives? (i.e., additional courses, etc.)  
 \_\_\_\_\_  
 \_\_\_\_\_

How well do you feel your Penn State education prepared you in the following areas:  
**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.)  
 \_\_\_\_\_  
 \_\_\_\_\_



Survey continued on back

## Alumni Survey cont.

<b>B. Applied Coursework</b>	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? \_\_\_\_\_

<b>C. Computational/Computer Skills</b>	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 Department of Aerospace Engineering, tell us which was your favorite and why. \_\_\_\_\_

What type of technical activities are you involved in at work? \_\_\_\_\_

Which courses taken at Penn State are you using in your job? \_\_\_\_\_

Of course any additional comments are always welcome. \_\_\_\_\_

Thank you! Please return the completed survey to Penn State University, Dept of Aerospace Engineering, 229 Hammond Building, University Park, PA 16802. Attn: Alumni Survey.

## 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 alumnns 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 alumnns in this data base) please send an e-mail to the Department at <http://www.aero.psu.edu>

Editors: Ed Smith, Joe Horn, Marilyn Warrender, Debbie Jacobs

### Statement of Non-discrimination

The Pennsylvania State University is committed to the policy that all persons shall have equal access to programs, facilities, admission, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by state for federal authorities. The Pennsylvania State University does not discriminate against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, or veteran status. Direct all inquiries regarding the non-discrimination policy to the Affirmative Action Director, The Pennsylvania State University, 201 Willard Building, University Park, PA 16802-2801; tel. 814-865-4700/V, 814-863-1150/TTY. U.Ed.Eng. 00-73.

### The Department of Aerospace Engineering

The Pennsylvania State University  
 229 Hammond Building  
 University Park, PA 16802

NON-PROFIT ORG.  
 U.S. POSTAGE  
**PAID**  
 STATE COLLEGE, PA  
 PERMIT NO. 1