

AeroGRAM

A newsletter for alumni & friends of the School of Aeronautics & Astronautics

covering the 2002-2003 academic year

Renovated rocket lab at Purdue is 'national resource'

By Emil Venere - Purdue News Service

WEST LAFAYETTE, Ind. - Purdue University has completed major renovations to a one-of-a-kind propulsion facility and has begun full-scale laboratory testing in research that includes work to develop engines for NASA's next-generation space shuttle.

Engineers working in the High Pressure Laboratory, one of six facilities at Purdue's Maurice J. Zucrow Laboratories, will perform research sponsored by the National Aeronautics and Space Administration, U.S. Air Force and U.S. Army, other federal agencies and aerospace companies, said Stephen Heister, a professor in Purdue's School of Aeronautics and Astronautics.

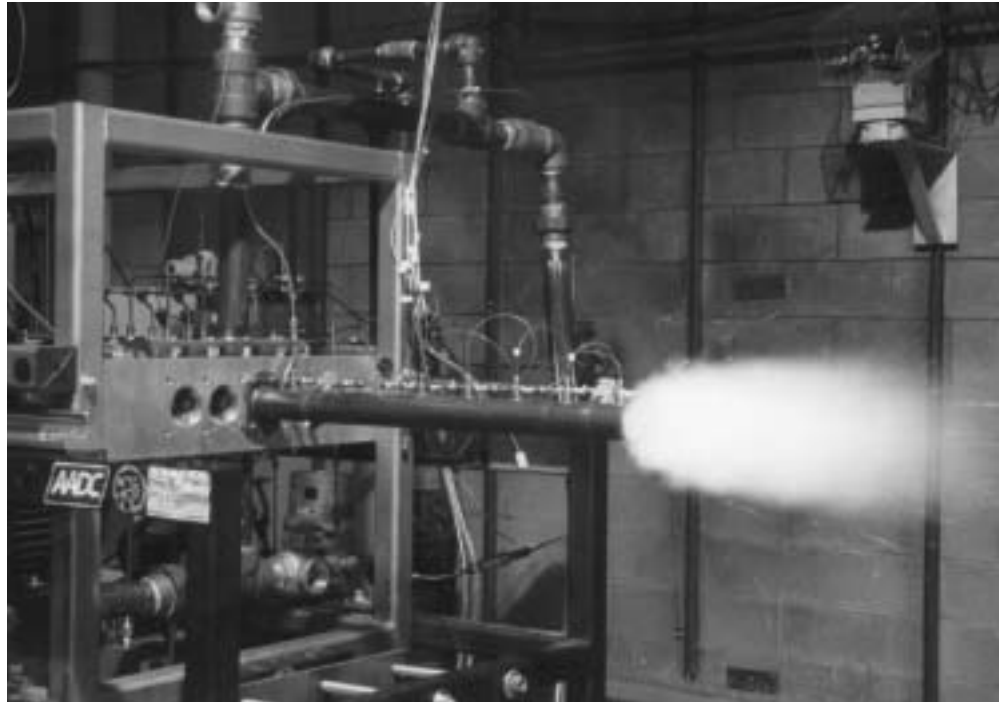
"It's the most comprehensive and most capable university propulsion facility in which to test engines at higher pressures and thrust levels," said Heister, who has led efforts to refurbish the lab.

Rocket tests began in June.

"This lab truly will become a national resource because of its scale and capabilities," said William Anderson, an associate professor of aeronautics and astronautics. "We will be able to study physical phenomena on the scale and conditions at which they occur in real rockets."

The lab will be an important training ground for a new generation of engineers, who will be essential for the nation's space industry to meet its goals, Anderson said.

"It is well recognized that there is a critical need for new grads as the engineers who began their careers in the '60s retire," he said.



A pulse detonation engine is fired at the Zucrow propulsion lab.

"By the time our students begin their professional careers, they will already have seen their designs transformed into experimental hardware and see how their analyses compare to actual results. NASA and industry realize this, and they have been very supportive of our efforts to build up this lab, and we are very appreciative of their support."

The rocket-testing facility within the High Pressure Lab, built in 1965, had not been upgraded since the mid-1970s. Jay Gore, the Vincent P. Reilly Professor of Mechanical Engineering and Associate Dean of Engineering for Research and Entrepreneurship, said in the interim, other, more modern portions of the lab have been active in combustion research for turbine engines used in aircraft and power generation and in work to improve diesel engines for trucks and other vehicles.

Purdue began rebuilding the lab two years ago, when it received a \$1 million, two-year grant from the Indiana 21st Century Research and Technology Fund, established by the state to promote high-tech research and development and to help commercialize university innovations. That work, which established the lab as the Indiana Propulsion and Power Center of Excellence, was carried out with help from the Allison Advanced Development Co. in Indianapolis, a division of Rolls-Royce Corp.

The renovated lab has already begun attracting research dollars.

"Over those two years that Purdue received \$1 million, we brought in almost \$3 million in research money, so we leveraged that money quite well," said Scott E. Meyer, senior propulsion engineer at the lab.

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AAE Headlines

I am very excited to report on progress of the Millennium Engineering Building, a key component in the ongoing execution of the \$400 million master facilities plan for the Schools of Engineering approved in 1999. Located at the corner of Northwestern and Stadium avenues, the multidisciplinary engineering facility will accommodate the School of Aeronautics and Astronautics, the School of Materials Engineering, Engineering Projects In Community Service (EPICS), Freshmen Engineering, minority and women in engineering, interdisciplinary engineering and other engineering programs. Gift funds will cover \$10 million of the cost for the 238,000-square-foot building. The state has authorized Purdue to issue bonds to cover the other \$37.7 million. With your help, as of this writing, Purdue is well on its way to raising the necessary gift funds. This is all very exciting—Thanks!

The 2002-03 Academic Year brought much excitement to the School and Purdue. Purdue University's Schools of Engineering announce the creation of eight signature areas, which represent considerable multidisciplinary strength across Purdue's engineering and related disciplines and present exciting opportunities for field-defining research, educational innovation, and IP spin-off. These eight areas address national priorities and promise tremendous international impact. Purdue University and the Schools of Engineering are investing substantially in 75 new tenure-track faculty positions and a \$400 million facilities expansion and upgrade to ensure unparalleled excellence in pursuing these interests. The School plans to increase the size of its faculty to 30 in part through the signature areas: advanced materials and manufacturing; global sustainable industrial systems; information, communications, and perception technologies; intelligent infrastructure systems; nanotechnologies and nanophotonics; renewable energy and power systems; system of systems; and tissue and cellular engineering.

The School's undergraduate enrollment again increased by 18% to 407 in the fall of 2002 giving it the largest undergraduate enrollment among its



Thomas N. Farris

peers. We are pleased to report the addition of two new faculty members the fall of 2003. Dr. Ivana Hrbud brings special expertise nuclear and electric propulsion with her. She will be joining the School from the NASA Marshall Space Flight Center. Dr. Charles L. Merkle is one of the world's leading figures in modeling and computational analysis of fluid flows related to propulsion. He will be joining both the Schools of Aeronautics and Astronautics and Mechanical Engineering from the University of Tennessee where he holds the H.H. Arnold Chair of Computational Mechanics. You will learn more about them in future correspondence. The faculty is proud that Purdue's exciting opportunities allow it to attract the very best faculty candidates.

Highlights of the year included the 4th William E. Boeing Lecture given by Major General John Hudson, Director of the Joint Strike Fighter Program, and the 4th Annual Outstanding Aerospace Engineer celebration. These events along with Homecoming and Gala Week are wonderful times for you to return to campus. We always welcome you back to campus so that we might show you up-close the educational opportunities that your support provides our students. Having you back on campus gives us the chance to say thank you for your support and, more importantly, connects you with our present students so that you too can know why we make educating Purdue Aeronautical and Astronautical Engineers our life's work. We strive to make the Purdue education live up to the standards that you remember so well and remind you that we cannot do so without your support. Thanks again for your part in making times at Purdue so exciting.

Renovated rocket lab continued from page 1

The high-pressure lab includes two “test cells,” blockhouse-like rooms with 18-inch-thick steel-reinforced concrete walls. Each cell contains two test beds, meaning four separate tests can be carried out at the same time.

One of the cells is for rocket testing. The other is for combustion research for turbine engines and for work in experimental propulsion systems such as “pulse-detonation” engines. These engines may lead to the development of “hypersonic” aircraft that travel several times the speed of sound. The advanced military and commercial aircraft are expected not only to travel faster, but also more efficiently and at lower cost than conventional jets. The lab is jointly operated by the School of Mechanical Engineering and the School of Aeronautics and Astronautics. Its namesake, Maurice J. Zucrow, was a Purdue mechanical engineering alumnus who, in 1928, earned the first doctoral degree in an engineering field granted by Purdue. His research in rocket propulsion inspired the construction of the first facility at Zucrow Labs in 1948. Since then, the Zucrow labs have evolved into a complex of six facilities on a 24-acre site west of campus, where engineers perform a wide range of propulsion-related research in rockets, jet engines and other internal combustion engines.

“Support from the 21st Century Research and Technology Fund made it possible to inject new energy into the propulsion and power effort at Purdue, which is one of our true legacies,” said E. Daniel Hirlleman, the William E. and Florence E. Perry Head of the School of Mechanical Engineering.

A critical part of the lab is a system that pressurizes the rocket fuel before feeding it to the test engines — a step that enables the facility to simulate the real thing. The Purdue lab is believed to be the only university facility in the nation capable of firing rockets with propellant-feed pressures up to 6,000 pounds per square inch and thrust levels up to 10,000 pounds of force, which are typical conditions that exist in advanced chemical rocket engines.

Rockets use special turbopumps to inject fuel at high pressure into the combustion chamber. In the lab setting, however, it is safer and more practical to use high-pressure nitrogen to push the fuel into the engine instead of using the turbopumps. Liquid nitrogen is held in a 2,400-gallon tank maintained at about minus 300 degrees Fahrenheit. The nitrogen is vaporized and transferred via metal tubing to holding tanks at pressures as high as 6,000 pounds per square inch for use in the experiments. While the engines are running in the test cells, data are collected by various sensors, and video cameras record the firing.

Another unusual feature in the lab is a large tank, or “heat exchanger,” in which natural gas heats air to test pulse-detonation and jet engines. Unlike rockets, jet turbines and pulse-detonation engines scoop air from the atmosphere in order to burn fuel. In live flights, the air in such engines is heated to hundreds of degrees. To simulate those operating conditions, air is artificially heated with natural gas and then fed into the test cell.

“I think we are well positioned to really contribute to a lot of the high-speed propulsion systems that are being developed because we have a large air supply, and we can heat air to simulate high-speed flight conditions,” Heister said.

Yet another factor that sets the Purdue lab apart from other university facilities is that it was designed originally for rocket testing.

“Because most facilities were not built to do this kind of work, they are landlocked on their campuses or limited in other ways,” Meyer said. “This lab was intentionally created to be remote from campus to be able to do this kind of work.”

Students are essential for the lab’s operation because they perform most of the work, gaining valuable experience in the process.

“The students not only have to fulfill their rigorous course work, they also come out here and do real engineering,” Meyer said. “They do the lion’s share of the work, running tubing and plumbing, doing the wiring, programming the data-acquisition systems, hooking up instrumentation, conducting the test operations.”

Senior Kevin Miller of Goshen, Ind., said opportunities in the lab influenced his decision to stay at Purdue for graduate studies.

“It’s extraordinary to have such firsthand exposure to all phases of a project,” Miller said. “I chose to stay on for grad school because I am extremely excited about the research that is being conducted here, and I feel that working in this particular lab environment will enable me to develop rapidly as an engineer.”

The first tests carried out in the refurbished lab were for Northrop Grumman Space Technologies, which is developing rocket engines for a new generation of space shuttles. Other work funded by NASA also will focus on testing engines for future space shuttles.

“The high pressure lab has been an invaluable experience in terms of hands-on, practical knowledge,” said Adam Butt of Carmel, Ind., who is studying for a master’s degree in aeronautics and astronautics. “Most engineers in the field only work on one aspect of a system design. Here we have the opportunity not only to design, but also to build, test, analyze, and redesign.”

“It’s an amazing and rare opportunity.”



Philanthropists of the Highest Order

A Purdue graduate and his wife are donating more than money to the university. They are also giving their time, their skills, experience and their names.



Michael and Madeline Kennedy

Mike Kennedy, BSAAE '70, DEA '00, OAE '01, and his wife Madeline have pledged \$300,000 to name the Mike and Madeline Kennedy Nondestructive Evaluation Laboratory in the future Millennium Engineering Building. Kennedy is also giving the school the benefit of his experience with engineering, problem solving and teamwork by taking a role in the planning stage to help create a more interactive environment in the classroom. This involvement will help build a world-class facility with interactive labs, new technology and new equipment.

"By expanding the facilities and getting into a more interactive environment, students can gain practical experience with different programs that can be interrelated with other team members who are also problem solving," he said.

Kennedy feels that his contribution will directly benefit both faculty and students and provide the best support for Purdue University. By starting from scratch, it is an opportunity to begin with a clean slate and configure the classrooms and labs accordingly.

The Kennedys believe that good citizens give back to education, and this is a chance for them to give back to a school Kennedy says they have always felt a close connection with.

Born in Springfield, MA, Mike Kennedy grew up in Southern California where his father worked as an industrial engineer for Douglas Aircraft Company. Choosing Purdue over UCLA or Cal-Berkeley gave him colder winters, but he felt that Purdue was more focused on engineering and he also wanted a true "college-town" experience. With a natural aptitude and interest in science, a future in either engineering or science seemed to be set.

Following industrial internship experience, Kennedy took the team lead in Prof. George Palmer's senior design project. Their goal was to come up with a conceptual design for a space shuttle. His first experience as program manager was a success when the group of faculty judged his team's design to be the best. It whetted his appetite to be more than a technology expert; he wanted to run a multidisciplinary team.

Kennedy graduated in 1970 and joined the McDonnell Douglas Astronautics Company. For the first 15 years of his career, he made his way up through the structural-mechanics analysis area from junior engineer to senior engineer of a large group where he served as a technology and an administrative leader. In the mid 1980s, he moved out of a pure technology area into a project / program management role.

Kennedy has held positions of increasing responsibility on programs such as Skylab; Saturn SIVB; Titan, Delta; Spacehab and the International Space Station. From 1996 he worked on the development side of the Delta Rockets program, and saw the merger of McDonnell Douglas with The Boeing Company in 1997. He was appointed Vice President for the Boeing Evolved Expendable Launch Vehicle (EELV) and Delta IV Launch Vehicle Program in 1998. He was program manager for the next generation of expendable launch vehicles. They were working towards an expected launch in 2001, but due to delays, the first launch was November 2002. Delta IV is evolved from the highly successful Delta family of rockets, which have been lifting satellites into orbit since 1960.

Following his retirement from Boeing in May 2001, Kennedy has worked as a consultant with Boeing Missile Defense Systems developing booster rockets for the National Missile Defense system. He is developing and implementing efficient management practices or "getting it right the first time."

Mike Kennedy is not all engineer. He has also had a parallel career as a professional songwriter, beginning this with his best friend while still at high school.

Out of 200 songs, about 30 have been recorded. One of those was Sonny and Cher singing "Heartbeat, It's a Lovebeat" on their Valentines Day show, for which Record World Magazine awarded the 1974 Song of the Year.

Madeline Kennedy had a highly successful career as senior manager for the Boeing Travel Company. Before she retired five years ago, she oversaw seven to eight offices and was on the road more than at home or in the office. As far as life after retirement is concerned she misses the people she worked with rather than the stress involved in the job. Madeline keeps in touch with her ex-colleagues and is a staunch supporter of the American Cancer Society. She also volunteers at the John Wayne Airport, thereby keeping in touch with the travel industry.

Mike and Madeline now feel that they have the best of both worlds, having more time together and now traveling for pleasure instead of for business. They visit their home in Hawaii often and enjoy the relaxed atmosphere this gives them.

The Kennedys feel strongly about education and medical research. They believe that better quality education provides the framework for the future. Their decision to donate to Purdue was related to their past connection with the School of Aeronautics & Astronautics. They hope that in the future, Purdue and the School of Aeronautics & Astronautics will attract the best students from those who have choices of universities.

"We need, not only to retain the current quality of education, but we need to invest in both students, faculty and facilities," Kennedy says.

Their involvement does not stop with this donation; the Kennedy's are also planning future contributions to Purdue. As true philanthropists, they have included the School of Aeronautics & Astronautics in their estate planning for a gift of \$550,000.

mars *Odyssey* UPDATE

PURDUE PROUD



Mars Odyssey photo courtesy of NASA.

Mars Odyssey releases first data archive to scientists

NASA has released the first set of data taken by the Mars Odyssey spacecraft to the Planetary Data System, which will now make the information available to research scientists through a new online distribution and access system. The fall 2002 issue of the *AeroGram* newsletter chronicled the success of this mission that has five Purdue alumni in key positions in the 2001 Mars Odyssey that is managed by NASA's Jet Propulsion Laboratory in Pasadena, CA. David A. Spencer BSAEE '89, M.S. '91 is Odyssey mission manager, Robert A. Mase BSAEE '89, M.S. '91 is head of navigation team, Julia L. Bell MS '91, Ph.D. '95, is spacecraft-maneuver designer, Stuart R. Spath BSEE '86 is spacecraft team chief and Peter G. Antreasian BSAEE '84, is navigator. The information released includes the first six weeks of mapping data through the end of March 2002, as well as the observations made during the cruise phase to Mars. The archive consists of formatted instrument data from the gamma-ray spectrometer and high-energy neutron spectrometer. New data will be released to the science community every three months.

The Odyssey data are available through a new on-line access system established by the Planetary Data System at:
<http://starbrite.jpl.nasa.gov/pds/>

The Odyssey data release, coupled with the availability of this new system, marks a significant improvement in access to data from solar system exploration missions. Beginning October 1, 2002, validated data from all Odyssey instruments will be available for search and retrieval immediately upon delivery to the Planetary Data System.

A guide to the Odyssey data sets is located at:

<http://wufs.wustl.edu/missions/odyssey>

L-R
Danny Rodriguez;
Jim Nolan;
Jen Watson;
Stephanie King



15TH ANNUAL RUBE GOLDBERG CONTEST KICKS OFF ENGINEERING WEEK

Purdue celebrates *Engineering Week*



In collaboration between engineering sorority Phi Sigma Rho and engineering fraternity Theta Tau, a Purdue University engineering team brought the Rube Goldberg Trophy back home on Saturday April 12, 2003 in the 15th annual national Rube Goldberg competition. School of Aeronautics & Astronautics junior Jen Watson, mechanical engineering junior Jim Nolan; Greg Franzer from chemical engineering; Stephanie King a civil engineering senior; Danny Rodriguez from industrial engineering and Ashley Mordasky from civil and environmental engineering; built a machine that used 34 steps to select, crush and pitch a 12-ounce aluminum can into a recycling bin. The theme was "Purdue Sports" and their machine has two levels, one decorated as a Purdue football field and the other as a Purdue basketball court. Following this win, the team, sporting Purdue University T-Shirts, then appeared on the David Letterman show on May 7, 2003, where their machine worked first time.

EUGENE A. CERNAN (CAPTAIN, USN, RET.)

Engineering week culminated with the Western Society of Engineers' Chicagoland Engineering Awards Benefit on Friday February 21, 2003 in Chicago. The society presented the 90th Washington Award to Purdue alumnus and astronaut Eugene A. Cernan EE '56. He received the award "for demonstrating human's capacity for space flight and performance on the moon." Cernan credited Purdue University with giving him an education that put him head and shoulders above much of the competition. As pilot of the June 1966 Gemini IX mission, Eugene Cernan became the second American to walk in space. He was lunar module pilot on his second mission of Apollo 10 in May 1969. This mission confirmed the operations performance and descended to within 8 miles of the lunar surface before returning to the command module. Cernan's last flight as spacecraft commander of Apollo 17 in 1972 saw the final manned lunar landing to date. From the lunar base of operations at Taurus-Littrow, three highly successful excursions to nearby craters and the Taurus Mountains were completed. Cernan's footprints are the last left on the lunar surface, along with a plaque that reads, "Here Man Completed His First Exploration of the Moon. December 1972 A.D. May The Spirit Of Peace In Which We Came Be Reflected In The Lives Of All Mankind."



School of Aeronautics & Astronautics students
Jayleen Guttromson and Gina Pieri meet Gene Cernan.

The William E. Boeing DISTINGUISHED LECTURE

The School of Aeronautics & Astronautics was proud to host the 4th William E. Boeing Distinguished Lecture on November 18, 2002. Major General John L. Hudson, MSAE '74, shared his thoughts on leadership, life and the next generation strike warfare weapon system with his lecture entitled "Life, the Universe, and the JSF Program."

Major General John L. "Jack" Hudson is Program Executive Officer and Program Director Joint Strike Fighter Program, Office of the Assistant Secretary of the Navy for Research Development and Acquisition, Arlington, VA. This joint program will develop and produce the next generation strike warfare weapon system for the U.S. Navy, Marine Corps., and Air Force; Royal Navy and Royal Air Force; and other countries under partnership and foreign military plans.

Among General Hudson's numerous awards and commendations are the Defense Distinguished Service Medal with oak leaf cluster, Defense Superior Service Medal, Defense Meritorious Service Medal with oak leaf cluster,



Meritorious Service Medal with two oak leaf clusters, and the Air Force Commendation Medal.

Linda P.B. Katehi, John A. Edwardson Dean of Engineering, Major General John L. Hudson, MSAE '74, and Head of School Professor Thomas N. Farris at the 4th William E. Boeing Lecture.

DISTINGUISHED ENGINEERING ALUMNUS *2003*



AAE Senior and ROTC Cadet Jeff Komives presents Maj. Gen Hudson with a Purdue sweatshirt.

For his outstanding service to the defense of the United States, particularly as director of the Joint Strike Fighter Program, the Schools of Engineering are proud to present the Distinguished Engineering Alumnus to Maj. Gen. John L. Hudson MSAE '74. The award was presented on April 25, 2003 in a daylong series of programs and events.

A total of ten graduates from the Purdue University Schools of Engineering were honored on the West Lafayette campus

during the 2003 Distinguished Engineering Alumni convocation. The awards are given each year to Purdue engineering graduates for their professional achievements and related accomplishments. The recipients were honored at the Stewart Center's Fowler Hall. Earlier in the day, the School of Aeronautics & Astronautics hosted a reception for Maj. Gen. John L. Hudson where he met faculty, students and staff of the school.

Walker 'Bud' Mahurin

A Hero in our Midst



When USAA Magazine ran "Heroes in Our Midst Contest," Marine Corp Captain Richard "Dick" Freeman BSAE '50, knew that Air Force Col. Walker "Bud" Mahurin BSAE '49 more than fit that category and wrote a letter of nomination. Mahurin is considered to be one of the best combat pilots America has ever produced, due in part

to his outstanding ability as an air-to-air shot. He is credited with 19.75 ariel victories in the European theater Operation, 1 victory in the South-West pacific Area and 3.5 Mig-15 jets in Korea, bringing his lifetime total to 24.25 victories in two wars. Selecting the winners wasn't easy, the judging team decided to add a third prize in order to honor as many heroes as possible. Bud Mahurin took Runner-Up place and is truly a "Hero in our Midst.

By the time that Bud Mahurin came to Purdue University to earn a degree in aeronautical engineering, he had already seen enough of the world to last a lifetime. Mahurin was born in Fort Wayne, IN and joined the Air Force when he was 20 to gain flying experience. Three months later, the bombing of Pearl

Harbor pushed the U.S to join Great Britain and the allies in World War II, charting a combat course for Mahurin and his peers. He was sent to London in 1943 to fly P-47s against the Luftwaffe and his group brought down more German aircraft than any other group. He was the first double ace in Europe and the first recipient of the Silverstar in the famous 56th Fighter Group, the "Wolf Pack", led by Col. Hubert A. "Hub" Zenke. He was shot down over France on March 27, 1944 and met up with members of the French Resistance who took care of him for a month until he was airlifted out by the British Royal Air Force. Due to his knowledge of the

ground fire. Too low to eject, Mahurin crash-landed into the mud of low tide. The plane broke into two parts and then rolled upside down. He broke his left arm and couldn't get out of his gear. In a matter of minutes he was captured by the Chinese and the North Koreans and was taken to the Manchurian border where he was placed in solitary confinement in a tiny cell. He received brutal treatment, fed only enough to keep him alive, deprived of sleep, cold through lack of clothing, constantly tortured and subjected to brainwashing, a new brutality unknown to the free world at that time. Mahurin was held for 16 months. He was the highest-ranking Air Force

serviceman to be captured at the time, and condemned as a war criminal, but was freed on the last day of the prisoner-of-war exchange program and returned to the U.S. After the war, he remained active in the Air Force and helped the Air Force, his willingness to discuss brainwashing techniques and physiological pressure applied to American POW's, greatly aided the content of survival courses.

Leaving active duty in 1956, Mahurin entered the aerospace industry and joined the Air Force Reserves, subsequently retiring as a Colonel. Today, one of the Air Force's leading living flying aces, still pilots a Piper Cherokee, and with his wife,

Joan, speaks at air shows and conventions. "I try to inspire our country whenever I can. We need to foster patriotism." The School of Aeronautics & Astronautics honored Mahurin in 1999 as "Outstanding Aerospace Engineer" and he returned to Purdue University later that same year as one of the schools "Old Masters," a program that gets the almost graduates ready for the new world of business. Dick Freeman sums it all up by saying "Bud is an outstanding example of what a hero should be and I'm proud to call him my best friend."

Awards

- The Distinguished Service Cross
- Silver Star
- Seven Distinguished Flying Crosses
- The Purple Heart
- Seven Air Medals
- The British Distinguished Flying Cross
- French Croix de Guerre
- Belgian Croix de Guerre

French Resistance, he was not allowed to return to combat in Europe, but embarked for combat in the Pacific Theater in January 1944.

On return to the U.S, Mahurin worked at the Pentagon and then returned to Purdue University where he earned a degree in aeronautical engineering before returning to the Pentagon. At the start of the Korean War, Mahurin wanted to get back to air combat and he got a temporary tour of duty when he flew with the 51st Fighter Wing and scored 3 1/2 victories before he was hit by

Purdue Alumni on the move



Major General Roy D. Bridges Jr.

Major Gen. Roy D. Bridges Jr, Center Director for NASA's Kennedy Space Center (KSC), Fla., has been named Center Director for the agency's Langley Research Center, Hampton, Va., Gen. Bridges, a retired U.S. Air Force Major General and former Space Shuttle pilot will assume his new duties Aug. 10, 2003.

"General Bridge's distinguished military service and flight experience as both a pilot and astronaut are vital to the continued success of Langley and its many cutting-edge aerospace and advanced technology programs," said NASA Administrator Sean O'Keefe. As a NASA astronaut, he piloted the Space Shuttle Challenger on mission STS-51F in July 1985. Gen. Bridges has held many key aerospace positions during his career. Prior to his last Air Force assignment at Wright-Patterson Air Force Base, Ohio, he was the Commander, Air Force Flight Test Center, Edwards Air Force Base in California. He also was Commander, Eastern Space and Missile Center, Patrick Air Force Base, Fla.; and Commander, 412th Test Wing, Edwards Air Force Base, Calif. He is a distinguished graduate of the U.S. Air Force Academy, Colorado Springs, Colo., where he earned a bachelor's degree in engineering science. Gen. Bridges received his master's degree in astronautics from Purdue University, Ind. In 1966 and in May 2001, he received an honorary doctorate of engineering degree from Purdue. Gen. Bridges has received numerous awards and honors. Most recently, he was awarded NASA's Outstanding Leadership Medal and the Presidential Meritorious Executive Award



Mark K. Craig

Mark K. Craig BSAE '71 was named Associate Director of Space Development and Commerce at Johnson Space Center, Houston, TX, effective October 6, 2002.

Craig graduated from Purdue in 1971 with a bachelor's degree in aeronautical engineering, pursued engineering post-graduate study at Rice University, and completed MIT's program for Senior Executives in 1992.

He has served in a number of progressively more responsible leadership positions at NASA Headquarters, the Johnson Space Center, and the Stennis Space Center, including Manager, Space Shuttle Staging Subsystem; Manager, Space Station Systems Engineering and Integration; Deputy Manager, Mars Rover Sample Return Project; Director, Lunar/Mars Space Exploration Initiative; principal architect of the NASA strategic plan; and Deputy Director, Stennis Space Center. Mr. Craig served as Acting Director of the Stennis Space Center from February 2001 until April 2002. The School of Aeronautics & Astronautics recognized Mr. Craig as and Outstanding Aerospace Engineer in 2000. Purdue University's Schools of Engineering presented Mr. Craig with the Distinguished Engineering Alumnus Award on April 19, 2002.



Michael J. McCulley

Effective May 15, 2003, USA Chief Operating Officer Michael J. McCulley was named to succeed Russell D. Turner as President and Chief Executive Officer of United Space Alliance. McCulley served as COO since 1999 and had responsibility for the day-to-day operations and overall management of USA. Prior to being named as COO, McCulley was vice-president and deputy program manager for the Space Flight Operations Contract. He previously served as the vice president and associate program manager for Ground Operations at the Kennedy Space Center where he was responsible for directing the integration of all processing activities associated with the Space Shuttle program. A retired U.S. Navy captain and a former NASA astronaut who logged more than 119 hours in space, McCulley piloted the highly successful STS-34 Shuttle Mission in October 1989. The crew deployed the Galileo spacecraft on its six-year journey to explore Jupiter.

Class Notes 2002-2003

Carl W. Blechsmidt BSAAE '55 is Vice President of Engineering with VASSOC Institute after serving as a Senior Managing Consultant with Verhalen & Associates. Mr. Blechsmidt is a board certified product safety manager, a member of Underwriters Laboratories electrical advisory council, the American Public Health Assoc., the Air Force Assoc. the International Consumer Product Health and Safety Organization, the National Space Society, and serves on the Editorial Board of the National Safety Council Journal of Safety Research.

Jim Denny BSAT '57 is Product Line Director for Smiths Aerospace Electronic Systems Division, Rockford IL. site. He previously held the post of Engineering Director.

James W. Nippert BSAAE '70, MS '71 is vice president of software development for Metro-Optix in Allen, TX.

Jerry M. Lake BSAA&ES '73 has been selected as a Boeing Technical Fellow and is now working as a Sr. Scientist at Boeing Satellite Systems, El Segundo. CA. (formerly Hughes Space)

John J. Hammiller BSAAE '75 is a lighting designer for Annapolis Lighting Co. in Rockville, MD.

William H. Gerstenmaier BSAAE '77 is manager of the International Space Program for NASA in Houston, TX.

Mike Johanns BSAAE '77 is director of new product operations for Dell Computers in Austin, TX.

Kurt R. Sadorf BSAAE '82 is commander for the Naval Special Warfare Command in San Diego, CA.

Jane M. Barnes Quirk BSAAE '84 is a systems engineer for the Missile Defense Agency in Arlington VA.

John DeWald BSAAE '85 is a Captain for Great Lakes Airlines and is based in Denver, CO.

Jeffrey A. Karnes BSAAE '86 Major USMC, completed tour as X-32 B Joint test Force Lead and test pilot on the Joint Strike Fighter Pilot Program. Flew 24 envelope expansion sorties in both X32A and X32B aircraft. Currently assigned to VMA-223 as Maintenance Officer and Harrier attack pilot at MCAS Cherry Pt. NC

Constance Musler BSAAE '88 received the Astronauts' Personal Achievement Award, The Silver Snoopy, for her contributions to astronaut candidate training for the International Space Station. Astronaut Nancy Currie presented the award. Connie's husband and two children were able to attend the presentation. Congratulations to Connie on this prestigious award.

Donald L. Porth BSAAE '88 is director of business management for United Airlines in Chicago, IL.

Stephen P. Arnone BSAAE '90 has accepted a position as a Senior Quality Control Engineer at Eli Lilly and co. in Indianapolis.

Anthony J. Gingiss BSAEE '90 is a director of product development for Media.net Communications in Manhattan Beach, CA.

Markus B. Heinemann BSAAE '92, MS '94, PhD '97 is an engineer for Alcoa Technical Center in Alcoa Center, PA.

James Winkelman BSAAE '92 is a Flight Test Engineer for Gulfstream Aerospace in Savannah GA. Jim was also the Flight Test Engineer on Gulfstream's GV-SP's first flight.

Mark W. Rutz BSAAE '93 MS'95 is senior applications software engineer at Lockheed Martin in Gaithersburg, MD.

Julie A. Fisher BSAAE '96 is a spacecraft systems engineer for Boeing Satellite Systems in El Segundo, CA

Cindy Mahler BSAAE '98 is working as Space Shuttle Ascent GNC Engineer for System Integration/Ascent GNC for Boeing - NASA Systems in Houston, TX.

Robert B. Tennant III BSAAE '02 is an aerospace engineer with the National Air Intelligence Center in Dayton, OH.

Tied the Knot

Michael J. Mattox BSAAE '90 and Cynthia Lau Jan. 5. 2002

Kristopher K. Kegerreis BSAAE '92 and Sharon Martin Aug 31

Family Additions

Christine E. Haven BSAAE '92, MS '95 and Robert A. Scott EET '83, EET '86 a son, December 30, 2001

David G Springer BSAAE '91, MS'99 and Angela W. Willison M'90, a daughter March 12

Elizabeth E. Sack BSAAE '91 MS '94 and Stephen Blok, a daughter, July 26

In Memoriam

It is with great sadness that we report the death of the following alumni:

Abram J. Sowarby Jr. BSAAE '45 Poughkeepsie, NY. May 14, 2002

Darius S. Flinn BSAAE '45 Woodland Hills, CA March 12, 2002

Gerald B. Lawton BSAAE '48 Mankata, MN October 8, 2002

Addison G. Dunn Jr. BSAAE '49 Indianapolis, January 29, 2002

Virgil L. Sticka BSAAE '49 Xenia, Oh. October 21, 2001

Harold L. Springer BSAAE '50 Titusville, FL. January 10, 2003

Raymond A. Fisher BSAAE '52 Auburn, NY, July 27, 2002

Isidoros A. Carnegis BSAAE '55 Dayton, OH. July 26, 2002

R. Emil Klath BSAAE '58 Foresthill, CA. August 23, 2002

Paul D. Nering, Jr. BSAAE '59 Houston, September 29, 2001

David A. Nagey BSAAE '69 Sherwood Forest MD. April 23, 2002

Alumnus Jim Winkleman Flight Test Engineer on Gulfstream's GV-SP first flight.



*Chief Test Pilot John O'Meara,
Project Pilot Al Morros, Jim Winkleman,
Flight Test Engineer and Bill Osborne,
Flight Test Engineer*

The Gulfstream V-SP (GV-SP), Gulfstream Aerospace Corporation's most technological advanced ultra-long range business jet, successfully completed a historic record first flight on July 18, 2002. The first flight lasted just over five hours and among the crew was School of Aeronautics & Astronautics alumnus Jim Winkleman BSAE '92, who served as Flight Test Engineer. With the ability to fly at 51,000 feet with speeds up to .88 Mach, the GV-SP can fly eight passengers and four crewmembers 6,750 nautical miles- the longest range available in a business jet, in effect; the GV-SP can fly directly from New York to Tokyo in 14 hours, 30 minutes without having to stop to refuel.

Dr. Charles E. Taylor



Honorary Doctoral Degree 2003

Purdue University awarded 12 honorary doctoral degrees during the May commencement ceremonies. Dr. Charles E. Taylor has earned recognition for his contributions as a pioneering researcher in photoelasticity and holography and as a gifted mentor who produced a new generation of mechanicians. Dr. Taylor earned his bachelor's degree in mechanical engineering in 1946 and his master's in engineering mechanics in 1948. In 1979, Dr. Taylor was elected to the National Academy of Engineering for his pioneering developments in three-dimensional photoelasticity and in the use of laser holography.

*Thomas F. Moran presents
Tom Farris with the signed
photo of the JSF X-35*



Joint Strike Fighter X-35

Thomas F. Moran presented head of school Tom Farris, with a framed photo of the JSF X-35 with the signatures of several Purdue Grads who contributed to the program. Included in the "JSF Honor Roll" are his son-in-law Kevin Goeldner BSAE '87, MSAE '88, George Wacker BSAE '64; Jeff Smith BSAE '83; Jon Clauss BSAE '85; William Call BSAE '76; Angie Knappenberger BSAE '91; Greg Walker BSAE '83; Jim Baxter BSAE '88; Dan Sturdevant; BSAE '84; Brian Kiger BSAE '82 and Derek Paige MSAE '92.

Tom Farris noted in his thank you letter; "It gives great pleasure interacting with alumni who have gone on to such wonderful accomplishments. The notion that you remember the school and want to give back is very fulfilling."

The Campaign for PURDUE



September 27, 2002: Purdue University unveiled "The Campaign for Purdue" – a seven-year, \$1.3 billion fund-raising effort that will be the largest ever undertaken by any university in Indiana. The importance of private dollars has become more and more important to all universities as state funding nationwide has not been able to keep pace with costs brought on by the revolution in technology, competition for faculty and other factors. The engineering schools' master plan unveiled more than a year ago, calls for \$250 million in new construction, \$100 million in new equipment and \$60 million in renovations to meet anticipated need for the next 15-20 years. The new and renovated buildings will expand the schools' physical and usable space by almost 60%. Purdue's undergraduate programs in engineering already rank among the best in the country, according to U.S. News & World Report magazine's annual survey, with more than 6,000 undergraduate students in its engineering programs; it already has one of the largest engineering campuses in the country.

The flagship building of the Schools of Engineering will be the new Millennium Engineering Building. This multipurpose facility will be a destination for young explorers, engineers, scientists, scholars and teachers. Sited on the corner of Stadium and Northwestern Avenue on the West Lafayette campus, it will house the School of Aeronautics &

Astronautics, Materials Engineering, and Freshman Engineering, Women in Engineering Program, Minority Engineering Program, Interdisciplinary Engineering, and Engineering Projects in Community Service, Cooperative Engineering Education, and the Deans of Engineering's Office. All facilities presently located at Grissom Hall and the Nuclear Engineering Building will be moved to the new building. Many of the teaching and research activities currently housed in the aerospace Sciences Laboratory (ASL) will also be moved to the new building. Currently home to 270 faculty, Purdue Engineering plans to add 75 new members over the next five years while, at the same time, replacing the additional 50-75 senior faculty expected to be lost to retirement. By 2007, almost half of the 345 faculty members will be new.

How you can help

There are many ways for you to contribute to The Campaign for Purdue-AAE. You can increase your current level of annual giving or make an outright gift, such as cash, property, gifts-in-kind, or appreciated securities. You can make a planned gift or a multi-pledged commitment. Deferred gifts can have significant tax and estate planning benefits for you and your family. If you choose to establish an endowment, your gift will be invested in perpetuity, and the annual income it generates will be used to support the University needs you select.

Your gift can be targeted to a certain area, or be unrestricted.

Every donation from alumni and from our corporate partners is crucial to achieve our vision. Every gift counts and will make a difference.

The Charitable Gift Annuity Program

A new program launched as part of The Campaign for Purdue means university benefactors can make a gift to Purdue and received guaranteed life-time payments in return. The Charitable Gift Annuity Program is administered through the University Development Office. In return for a gift of a specified amount, Purdue will pay the designated recipient an income for life. In addition to the payments from the annuity, there is an income tax deduction for a portion of the gift. While a gift annuity can generate a current stream of income, another way to use the program is to set up a deferred-payment gift annuity, selecting a future date to begin receiving payments. Deferred gift annuities are becoming increasingly attractive to individuals who are already mailing the maximum allowable contributions to their qualified retirement plans and are searching for tax-deductible ways to supplement their retirement income. Alternatively, the program can be used to provide for a dependent relative. For information, please contact us today.

Rolls-Royce University Technology Center at Purdue

Indianapolis based Rolls-Royce Corp. announced on January 21 that it has formed a university technology center at Purdue University, an alliance in which researchers will work on propulsion technologies for future aircraft that may fly as fast as seven times the speed of sound.

This center, which is the first created at a university in the United States, is based at Purdue's Maurice J. Zucrow Laboratories, where engineers conduct research in propulsion.

Rolls-Royce has 19 university technology centers in the United Kingdom and one in Sweden, and has strategic relationships with eight other universities, as well as with the German Aerospace Research Establishment. The university

technology program provides support for product development and more fundamental research, including work to develop jet engines for civilian and military aircraft.

Engineers at the Zucrow Laboratories will be led by Stephen Heister a professor at the School of Aeronautics & Astronautics. Purdue will work with Rolls-Royce in research to develop engines for future aircraft that use high Mach propulsion systems to travel three to seven times the speed of sound or up to 5,000 miles per hour. They will study the behavior of jet fuels at the high temperature and pressures required for high Mach propulsion aircraft. Researchers will also focus on creating a new class of fuel injectors for the engines.

Rolls-Royce will enhance current research projects and educational goals at Purdue. In partnership with Purdue, Rolls-Royce will provide testing and validation of theoretical design applications, financial support, and opportunities for Purdue students and Rolls-Royce personnel to participate in the research and education provided through the program.



L-R Lars Larson; E. Dan Hirlleman; Mike Howse; Dean Linda Kateh; Thomas Farris and Heinrich Weyer.

Indiana Space Grant Consortium Annual Meeting

The ISGC under the Directorship of Prof. Barrett Caldwell from the School of Industrial Engineering held their annual conference on Friday

April 11, 2003, at Purdue University. The Space Grant Consortium is made up from a group of nine universities and five institutions that works with

schoolchildren, teachers, college students, industry and museums to increase that public's knowledge about the science of space exploration. It is one of more than 50

such groups nationwide funded by NASA. The ISGC is the major sponsor for the Purdue Fall Space Day hosted by the Students for the Exploration and Development of Space (SEDS) Aeronautical and Astronautical Institute of America (AIAA) and the School of Aeronautics & Astronautics.



A&AE students George Pollock and Gina Pieri at the ISGC poster session.

Purdue on the Road

During the last year, the School of Aeronautics & Astronautics has taken part in various events around the region. Here are some highlights of the events with faculty and students who have represented our School.

Purdue Day in Chicago – Navy Pier July 20, 2002

The School of Aeronautics & Astronautics at Purdue University showcased their faculty, students and programs at Chicago's Navy Pier in the first Purdue Day in Chicago. There was food, fun and many family activities at Navy Pier.



Prof. Tom Farris, students Brian Ventre and Jayleen Guttromsom at Purdue Day Navy Pier, Chicago.

Jamie Canino - representing the School of Aeronautics & Astronautics at Purdue Day - Indiana State Fair August 14, 2002



Discover Purdue at the Indiana State Fair

More than 40 tents all showcasing Purdue University took part in the first ever Discover Purdue day at Indiana State Fair. The day was filled the music from the "All-American" Marching Band and the Purduettes ensemble, rides on the Boilermaker Special, student-designed race cars, robots and an Amelia Earhart exhibit. History making Purdue Astronaut Jerry Ross was also on hand to pose for photos.

Purdue Day at the fair is the first stop in an effort to take Purdue to the people of Indiana. Stops were also made in Vincennes on Sept. 18, Logansport on October 29, Aurora on November 26, Indianapolis on December 13, Rensselaer on January 21; Columbia City on February 18; Scottsburg, March 21 and Anderson April 24. The events are part of the university's ongoing Discover Purdue initiative, designed to give citizens and prospective students an inside glimpse of the university.

Dayton Air Show - July 19, 2002



Col. Mark Brown BSAE '73 at the SOAR Program.

And closer to home...

AAE Picnic - August, 2002



Prof. John Rusek, Prof. Emeritus Gus Gustafson, Linda Flack and grad student Ben Stein at the AAE picnic at Columbia Park, Lafayette, Indiana.

Purdue Makes the Grade

Purdue University graduate engineering programs ranked ninth overall in the nation, and seven individual programs were among the top ten in a U.S. News & World Report survey released on April 4, 2003. Purdue was tied with the University of Texas, Austin, based on data provided by 168 schools. Purdue was ranked 12th last year. The School of Aeronautics & Astronautics ranked sixth in the country. In a separate category, employers placed Purdue engineering among the top 10 in the nation.

The 2003 edition of Kaplan's "The Unofficial, Unbiased Insiders Guide to the 320 Most Interesting Colleges" lists Purdue, as one of the nation's best in

PURDUE
one of the nation's best ...

career services and best in value. Inclusion in the Kaplan list reaffirms that Purdue not only educates students, but also is successful in guiding them toward careers even in difficult job markets.

Purdue is recognized for its large-sized college with a small-size feel. The guide is published by Simon & Schuster and is often found in high school guidance counselors' offices and is a known source for college-bound high school juniors and seniors.

Purdue's engineering program is among the largest in the United States. It encompasses 13 schools, departments and divisions, with 6,312 undergraduate students, 2,248 graduate students and about 270 faculty members.

colloquium series 2002-2003

DATE/TIME	TOPIC	SPEAKER
August 29, 2002 4:00 p.m. Grissom 166	The Founding of the Aerojet Engineering Corporation and its CALCIT Connection	Chuck Ehresman Professor Emeritus of Mechanical Engrg. Purdue University
September 5, 2002 4:00 p.m. Grissom 166	Building Low-Cost, Reliable Launch Vehicles: The Plan for Space Exploration Technologies, a New Rocket Company Headquartered in El Segundo, CA	Elon Musk, CEO Thomas Mueller VP Propulsion Space Exploration Company
September 26, 2002 4:00 p.m. Grissom 166	Prediction of Fatigue Performance in Gas Turbine Blades after Foreign Object Damage	Dr. David Nowell Dept. of Engineering Science Univ. of Oxford
September 27, 2002** 4:00 p.m. Grissom 160	Propagating Instabilities in Solids	Stelios Kyriakides Professor Univ. of Texas @ Austin
October 10, 2002 4:30 p.m. Grissom 280	Past, Present and Future of Propulsion Technology at Pratt & Whitney	Nathan Messersmith VAATE Program Manager Pratt & Whitney Advanced Military Engine Programs
October 17, 2002 4:00 p.m. Grissom 166	Electric Propulsion Overview	Frank Curran Manager, Technologies Decision Division SAIC
October 18, 2002* 4:00 p.m. Stewart Hall	Fluid Mechanics in Small Devices	Howard Stone Professor Harvard University
November 1, 2002 4:30 p.m. Grissom 166	NASA Propulsion – Present Activities and Future Plans	Robert Sackheim Asst. Dir. & Chief Engr. Propulsion NASA Marshall Space Flt. Ctr.
November 14, 2002 4:30 p.m. Grissom 280	Aircraft Design – the Process to the Product	Robert Sandusky NASA Langley Res. Ctr.
November 15, 2002** 4:00 p.m. Grissom 276	Mechanics in the New Biology from DNA Packing to Molecular Motors	Rob Phillips Professor, Mech. Eng. & Applied Physics California Inst. Technology
November 18, 2002*** 4:00 p.m. Fowler Hall	The William E. Boeing Distinguished Lecture "Life, the Universe and the JSF Program"	Major Gen. John L. Hudson Program Executive Officer and Program Director, Joint Strike Fighter Program
November 21, 2002 4:30 p.m. Grissom 280	The Lockheed Martin Atlas V-Program, First Launch, and Future	William Green Director, Dept. Test Gail Ryan Sr. Mgr. Tech. Dev. Lab. Lockheed Martin
January 23, 2003* 6:30 p.m. East Faculty Lounge, PMU	Changing the Shape of Aeronautics – the Case for Autonomous Morphing Aircraft	Terrence A. Weisshaar DARPA Program Mgr. and Purdue AAE Professor
February 14, 2003 2:30 p.m. GRIS 274	Designing Precision Pointing Spacecraft at Lockheed-Martin	Dr. Jeff Fisher Lockheed-Martin
February 20, 2003 4:30 p.m. GRIS 280	The Stability of Disconnected Capillary Surfaces	Dr. Lev Slobozhanin Case Western Reserve Univ.
February 24, 2003	MEMS Microvalve for Harsh Environment	Dr. Charles E. Seeley General Electric Global Research Center
February 26, 2003 4:00 p.m. Heav Hall 128	Tracing the History of the Hartmann Tube Motivated by Present Day Applications	Dr. Ganesh Raman Mechanical & Aerospace Engr. Illinois Inst. of Technology
April 8, 2003 2:00 p.m. GRIS 280	Review of Hypersonic Quiet Tunnels and Experiments at NASA Langley	Dr. Stephen P. Wilkinson NASA Langley Research Ctr.
April 25, 2003** 4:00 p.m. ME 256	Paradoxical Behaviour Associated with Rolling of Rigid Bodies	Dr. Keith Moffatt Ecole Normale Superieure France
May 1, 2003 3:30 p.m. GRIS 276	High-Order Computational Methods for Multi-disciplinary Simulation	Dr. Miguel R. Visbal Air Force Research Lab WPAFB

*Jointly sponsored by the School of Aeronautics & Astronautics and the Student American Institute of Aeronautics and Astronautics Chapter

**Jointly sponsored by the School of Aeronautics & Astronautics and the Mechanical Engineering Dept.; Midwest Mechanics Seminar

***William E. Boeing Distinguished Lecture sponsored by the School of Aeronautics & Astronautics

BOEING PURDUE PARTNERSHIP PROMOTES **diversity, innovation.**



*David Swain BSAE '64,
DEA '93, OAE '99,
HDR '00.*

The Boeing Company announced on January 22, 2003 a four-year educational partnership with Purdue University. The partnership includes a \$1 million grant which focuses on providing women and minority engineering and business students with academic scholarships, programs, organizations, and projects that support student development.

The Boeing–Purdue partnership programs are designed to stimulate and maintain interest in engineering and

business careers paths primarily underrepresented students. Technical and critical skill development will be the primary focus of the programs.

The School of Aeronautics and Astronautics benefits directly from this partnership through support of departmental needs and curriculum development.

To acknowledge Boeing's most recent gift to Purdue, President Martin C. Jischke presented David Swain BSAE '64, DEA '93, OAE '99, HDR '00, Boeing executive vice president, office of the

chairman, and chief technology officer with the university's highest honor, the Pinnacle Award, who received the award on behalf of the Boeing Company.

Swain has close ties with Purdue and holds a bachelor's degree in aeronautical engineering from Purdue University and honorary doctorates in engineering from Purdue University and Rose-Hulman Institute of Technology. He was the recipient of the 1993 Distinguished Engineering Alumnus Award and the 1999 Outstanding Aerospace Engineering award from Purdue University.

Life After Purdue University

Jeff Rodrian's involvement with aviation as a pilot and helping his father on their homebuilt aircraft set a career in aviation on his horizon. A strong interest in math and science were enriched with hands-on experience provided by the strong technology department at his high school. After reviewing the top schools for Aeronautical Engineering and visiting several, Jeff found the opportunities and atmosphere at Purdue created a situation for an outstanding educational experience. During his "Days on Campus" conversation with Prof. Gustafson, during his last year before retirement, the facilities of the Aerospace Sciences Laboratory were mentioned. A visit to the Laboratory and an informal conversation with graduate students working in the lab left Jeff with a positive image created by the facilities available to students and the energetic attitude of the students.

As a freshman in fall of 1997 Jeff knew that the School of Aeronautics & Astronautics was the school of his choice. During his junior year, under the direction of Professor Bill Crossley, Jeff and a team of six students won 2nd place and a prize of \$2000 in the NASA AGATE design competition for its design of a six-passenger, high performance aircraft.

The team designed the Sillarius 490, which incorporate an air cushion landing system permitting takeoffs and landings from any relatively flat surface including water. The use of an Air Cushioning Landing System in the design also garnered the team the award for best use of Air-Force Developed Technology. The active support of the project by the faculty positively reinforced the impression that the faculty is eager to support undergraduate students' academic pursuits following their own interest. The summer after his junior year Jeff had an internship experience with Cirrus Design, a manufacturer of a 4-seater certified all composite aircraft. Jeff had a very positive internship experience with Cirrus gaining practical engineering knowledge and skills with a relation to class material. A connection between the internship experience and school was found in his senior design project.



Jeff E. Rodrian BSAAE '00, MS '03 Outstanding Graduate Student 2003

For his Senior Design Project, A&AE 451, his team decided to use a composite wing instead the traditional balsa wood. Jeff's summer internship gave the idea of how it could be done and Professor John Sullivan gave suggestions on how to make it happen. The team successfully flew the first composite wing for AAE 451; fabricated using computer controlled machined molds for the lay-up of a composite wing. The aircraft was presented to the faculty and public during a flight demonstration in the Mollenkopf Athletic Center. Following a conventional take off, the aircraft had an endurance of 10 minutes. The aircraft demonstrated the ability of an on-board gyro to change the flight characteristics of the plane.

Jeff and Chris Peters formed a team to complete the Hyperion aircraft design in the spring of 2001. The Hyperion is a radio-controlled model aircraft designed for a pilot representing Guatemalan in the F3A World Aerobatic Championships. The project was done as part of Professor Sullivan's AAE490/590T class, collaborating with students from the Department of Aviation Technology. The complete design and building was completed in 6 months. The Hyperion was fabricated with carbon fiber prepreg, a standard in the aerospace industry, and used a complete computer model to validate the design. The strong support of faculty from both schools was complimented by active support from industry.

During Jeff's senior year he decided to continue his engineering education with the pursuit of a Master of Science in Aeronautics and Astronautics at Purdue University. The opportunity to work with Professor Alten F. Grandt Jr. and develop projects for undergraduate students focusing on real world applications of class material was supported with the Raisbeck Engineering Graduate Assistantship for Design-Build-Test Activities. The focus of Jeff's work was the development of self-contained

projects for undergraduate students and increasing their practical experience through interaction with students in the Department of Aviation Technology. In addition to the development of a project for the introductory structures class, the visibility of the Design/Build/Test opportunities offered by the school were increased with a website and brochure Jeff developed.

After calling Purdue University home for 5 and a half years, Jeff began his job search several weeks after the start of the fall 2002 semester and was significantly assisted by the contacts of the school. Faculty members were always interested in the progression of the job search and offered advice and encouragement throughout the process.

Events such as the Outstanding Aerospace Engineers Banquet provided opportunities to meet with alum and create contacts for the job search. With a solid education from The School of Aeronautics and Astronautics the major aerospace corporations were eager to review his resume. The schools faculty was also able to help with contacts.

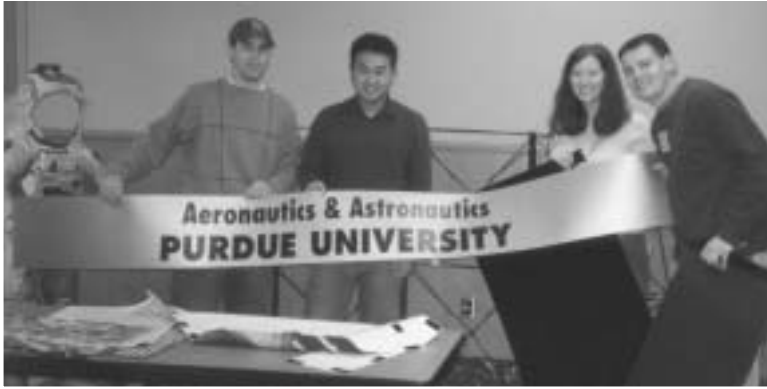
After talking to and visiting several aerospace companies, Jeff accepted a job with Boeing in Philadelphia. Jeff joined the Structural Technology & Prototyping group which is responsible for refining computer simulation of structures and developing advanced structural designs for rotorcraft. Jeff says, "The academic level of my education has prepared me for the technical challenges of the aeronautical engineering industry. Above the academic qualifications of the school, the opportunities for students to fuel a passion for Aeronautical and Astronautical engineering with the support of faculty and staff created a complete educational experience for me.

The great friendships formed at Purdue were an integral part of my enjoyment during my time at Purdue."

At the commencement ceremonies on campus on May 17, 2003, Jeff was named at Outstanding Graduate Student for the School of Aeronautics & Astronautics.

Study Abroad Student James Pinyard who studied at Bristol University in the U.K talks with prospective parents and student.

Students from the School of Aeronautics & Astronautics



Prof. Marc Williams with some interested parents and student.



James Pinyard talks about Study Abroad to parents.

Gina Pieri shows the video of the zero-G experiments also known as the vomit comet.



Josh Jung explains his rocket to High School honors students.



The Schools of Engineering hosted Golden Honors Day in the Stewart Center on Saturday December 7, 2002. High School honor students and their parents spent the day on campus where they had the opportunity to talk to faculty and students from the Schools of Engineering.





Outstanding aerospace eng

Seven Purdue University graduates received the Outstanding Aerospace Engineer Award during the School of Aeronautics & Astronautics fourth annual awards ceremony on Thursday November 7, 2002 at the University Inn, West Lafayette, IN.

"These seven Purdue alumni share special honor for their demonstrated excellence in industry, governmental service or other endeavors, which reflect the value of an aerospace engineering degree," said Linda P. B. Katehi, the John A. Edwardson Dean of Engineering. "These inductees join an elite group of exemplary graduates who have taken their Purdue education and reached great heights in their fields."

With this year's recipients 79 graduates of the school have received the awards since 1999.

"As we celebrate the 4th anniversary of the awards, these seven alumni have made significant contributions to the

aerospace field, holding positions of high responsibility in government and private industry," said Thomas Farris, professor and head of School of Aeronautics and Astronautics. "We are proud to give them the award that we reserve for our very best."



Prof. Dominick Andrisani, Isabella Williams, Ho Jung, Bernadette Farris.



Rick Kosdrosky & Carol Marshall represent Lockheed Martin.

Susan Kahn, John Nestle and Dominic Andrisani.



Past & Present OAE's K.O. Johnson & Jerry Lockenour.



*Past OAE's Tom McKane;
K.O. Johnson and John Rich.*

Engineers award 2002

This year's recipients are:

Paul M. Bevilaqua

Chief Scientist,
Advanced Development Programs
Lockheed Martin Aeronautics Company

Jerry L. Lockenour

Integrated Product Team Leader
Northrop Grumman Corporation

Dr. Steven E. Lamberson

Chief Scientist,
Airborne Laser System Program Office
Kirtland Air Force Base

John H. McMasters

Technical Fellow
The Boeing Company

Dr. Joseph D. Mason

Vice President,
Systems and Integration
Technology Group, Retired
TRW

J. Michael Murphy

Vice President
Advanced Technology Associates, Inc.

David A. Wagie

Brigadier General, Dean of the Faculty
United States Air Force Academy



*L-R Thomas N. Farris; J. Michael Murphy; Steven E. Lamberson; John H. McMasters;
John L. Lockenour; Paul M. Bevilaqua; Joseph D. Mason;
not pictured David A. Wagie.*

*Student Olivia Djibo
and OAE John McMasters.*



Daniel Devitt and George Palmer.



Industrial Advisory Council

2002-2003

The Industrial Advisory Council serves an important role in the School of Aeronautics & Astronautics. The success of our programs depends on strong support from Industry and the Industrial Advisory Council serves as a link

between industry and the university. The IAC meet twice a year in the fall and spring and review a large variety of topics related to our current operations and future goals. The fall meeting was held on September 20, 2002, and the spring one on April 10, 2003

The current members of the IAC are shown below. We sincerely appreciate the efforts of the members of the IAC to take time from their busy schedules to assist us in our programs, and look forward to working with them in the future.

Fall 2002 - IAC members lunch with AAE students.



L-R Tom McKane, Olivia Djibo, Matt Stout, Charley Saff.

Dr. William H. Ailor III (PhD 1974)
Principal Director
Space Hazards and Operations Support Directorate
The Aerospace Corporation

Mr. Bradley Duane Belcher (BS 1982)
(IAP Member)
PT Leader
Joint Strike Fighter F120 Core Development
Allison Advanced Development Company

Dr. Paul M. Bevilaqua (MS 1968; PhD 1973)
Chief Scientist
Lockheed Corporation

Ms. Nancy Carpenter
(IAP Member)
Program Manager
Technology Programs, Science & Engineering
ATK Thiokol Propulsion

Ms. Andrea M. Chavez (BS 1988)
Engineering Manager, Spacecraft Subsystems Group
Engineering/Technology Products
Ball Aerospace & Technologies Corp.

Mr. Joseph J. Gernand (BS 1980)
(IAP Member)
Program Director Shuttle Integration
Boeing North American
Space Systems Division

Dr. William C. Kessler (BS 1964, MS 1965)
Vice President Enterprise Productivity
Lockheed Martin Aeronautics Company

Dr. Andrew M. King (MSME 1984, PHD 1988)
Engineering Director
Boeing Satellite Systems

Dr. Donald L. Lamberson (BS CHE 1953)
Major General, USAF (Ret.)
Technical Advisor and Consultant

Mr. David K. McGrath (BS 1983, MS 1984)
Chief Technical Advisor
ATK Tactical Systems

Mr. G. Thomas McKane Jr. (BS 1966)
President/CEO
A.M. Castle & Co.

Mr. Hank Queen (BS 1974)
(IAP Member)
Vice-President of Engineering-Product Integrity
Boeing Commercial Airplane Group*

Mr. Charles Robert Saff (BS 1971)
Boeing Technical Fellow
Boeing Company

Mr. Randal E. Secor (BS 1976)
Naval UCAV Program Manager
Northrop Grumman Corp.

Dr. Robert L. Strickler (BS 1960, MS 1962, PHD ME 1968)
(IAP Member)
President and General Manager
TRW Environmental Safety Systems, Inc.

“DISCOVER PURDUE” 2002 HOMECOMING CELEBRATION

victories & heros

The largest Homecoming celebrations in Purdue history took place on Saturday September 28, 2002. All schools and departments of the University were represented in the Purdue Mall and Memorial Mall. They showcased educational enrichment opportunities and other programs during the daylong event with displays that highlighted their schools achievements. A full day of events took place before the 5:00pm football game against Minnesota. The day also served as a University-wide kickoff to Purdue's capital campaign, which is designed to raise money for scholarships, construction and endowments.

With the Homecoming theme of Victories and Heroes, Purdue astronaut Jerry Ross took the microphone to deliver “I am an American” to the Homecoming



crowd. This had more than special meaning to Ross as on April 16, 2002, he set the United States record with nine space walks, and a world record with his seventh mission. Ross was woken up on that morning with Roy Johnson reciting, “I am an American” and the Purdue “All American” Marching Band play America the Beautiful. The patriotic tradition has been ingrained in his consciousness since Ross was a student at Purdue in the late 1960's and early 1970's. For the first time, the famous words recited by Purdue alums around the world, were also beamed in from outer space.

New Graphic Identity

A University wide committee has worked with several focus groups and the Office of University Relations to develop a new graphic identity for Purdue. The initiative to create a new graphic image for Purdue was led by Purdue President Martin Jischke who says the image was designed to enhance the University's brand recognition and to reinforce the connection between the Purdue name and its worldwide reputation for excellence.

“I believe that a unique and attractive image presented across all media will have a positive effect on all our endeavors, including recruitment of students, faculty and staff, govern-metal relations, public relations, private fund raising and sponsored program activity.” The look will be consistent and the words Purdue University is now on all printed materials, stationary, signage and on other media.

PURDUE
UNIVERSITY

AAE Faculty Roster

Aerodynamics

G. A. Blaisdell, Associate Professor, Ph.D., Stanford, 1991, computational fluid mechanics, transition and turbulence.

S. H. Collicott, Associate Professor, Ph.D., Stanford, 1991, experimental and low-gravity fluid dynamics, optical diagnostics, applied optics.

M. C. Jischke, University President; Ph.D., Massachusetts Institute of Technology, 1968.

A. S. Lyrintzis, Professor, Ph.D., Cornell, 1988, computational aeroacoustics, aerodynamics for jet flows and rotorcraft.

S. P. Schneider, Associate Professor, Ph.D., Caltech, 1989, experimental fluid mechanics, high-speed laminar-turbulent transition.

J. P. Sullivan, Professor, Sc.D., MIT, 1973, experimental aerodynamics, propellers, laser-doppler velocimetry.

M. H. Williams, Professor and Associate Head, Ph.D., Princeton, 1975, aerodynamics, computational fluid mechanics.

Dynamics and Control

D. Andrisani II, Associate Professor, Ph.D., SUNY at Buffalo, 1979, estimation, control, dynamics.

M. J. Corless, Professor, Ph.D., Berkeley, 1984, dynamics, systems, control.

A. E. Frazho, Professor, Ph.D., Michigan, 1977, control systems.

K. C. Howell, Professor, Ph.D., Stanford, 1983, orbit mechanics, spacecraft dynamics, control; trajectory optimization.

J. L. Garrison, Assistant Professor, Ph.D., The University of Colorado, 1997, satellite navigation, GPS, remote sensing.

J. M. Longuski, Professor, Ph.D., Michigan, 1979, spacecraft dynamics, orbit mechanics, control, orbit decay and reentry.

M. A. Rotea, Professor, Ph.D., Minnesota, 1990, robust and nonlinear multivariable control, optimization, system identification.

Propulsion

W. E. Anderson, Assistant Professor, Ph.D., Pennsylvania State Univ., 1996, combustor design, combustion stability, atomization, and combined cycle propulsion.

S. D. Heister, Professor, Ph.D., UCLA, 1988, rocket propulsion, liquid propellant injection systems.

J. J. Rusek, Adjunct Assistant Professor, Ph.D., Case Western Reserve, 1983, experimental energy conversion and rocket propulsion.

Structures & Materials

W. A. Crossley, Associate Professor, Ph.D., Arizona State, 1995, optimization, rotorcraft and aircraft design, structure design.

J. F. Doyle, Professor, Ph.D., Illinois, 1977, structural dynamics, experimental mechanics, photomechanics, wave propagation.

T. N. Farris, Professor and Head, Ph.D., Northwestern, 1986, tribology, manufacturing processes, fatigue and fracture.

A. F. Grandt, Jr., Raisbeck Engineering Distinguished Professor for Engineering and Technology Integration, Ph.D., Illinois, 1971, damage-tolerant structures and materials, fatigue and fracture, aging aircraft.

P. K. Imbrie, Assistant Professor, Freshman Engineering, Ph.D., Texas A & M, 2000, educational research, solid mechanics, experimental mechanics, nonlinear materials characterization.

H. Kim, Assistant Professor, Ph.D., Univ. of California-Santa Barbara, 1998, composites, applied mechanics, structural dynamics.

C. T. Sun, Neil A. Armstrong Distinguished Professor of Aeronautical and Astronautical Engineering, Ph.D., Northwestern, 1967, composites, fracture and fatigue, structural dynamics.

T. A. Weisshaar, Professor, Ph.D., Stanford, 1971, aircraft structural mechanics, aeroelasticity, integrated design.

Prof. Mario A. Rotea and former graduate student Fernando D'Amato have developed a software tool that is more than 100 times faster than other programs used by engineers to improve jet engine designs. The software analyzes engine models and quickly extracts information that indicates where the design is mechanically sound.



Rotea presented his new findings in a paper entitled "New Tools of Analysis and Optimization of Mistuned Bladed Disks" in July 2002 during the 38th Joint Propulsion Conference and Exhibit in Indianapolis and also during the 15th World Congress on Automatic Control in Barcelona, Spain.

Engine designers use computer models to test designs before actually building an engine. The models predict how the multitude of critical engine parts will react to factors such as wear or damage and manufacturing variations. The software developed is based on an "optimization algorithm" which is a step-by-step procedure for solving a mathematical problem. This algorithm calculates the worst-case vibration level of the blades due to variations in mechanical problems.

The work was funded by the National Science Foundation and by private industry.

Faculty Update

Appointment of Dr. David L. Filmer - Fall 2002



Dr. David L. Filmer

Dr. David L. Filmer was appointed Adjunct Associate Professor of Aeronautics & Astronautics. He is coordinating efforts to build a Purdue satellite.

Appointment of new faculty member for 2003

Welcome to new faculty member Dr. Ivana Hrbud who will join Purdue as an Assistant Professor of Aeronautics & Astronautics in the fall of 2003

Professional Engineering Publishing Award

The Editorial Board of the Journal of Strain Analysis has selected Prof. Tom Farris and P.T. Rajeev for the 2002 Professional Engineering Publishing Award. Their paper "Numerical analysis of fretting contacts of dissimilar isotropic and anisotropic materials" was published in vol. 37, issue 6.

Elmer F. Bruhn Teaching Award

Prof. William Crossley has been selected by the Teaching and Student Awards Committee to receive the Elmer F. Bruhn Teaching Award for 2003 and is the School's nominee for the engineering wide A.A. Potter Best Teacher Award.



Prof. William Crossley

W.A. Gustafson Undergraduate Teaching Award

The winner of this year's award is Prof. Anastasios Lyrintzis, who is also the School's nominee for the Murphy Outstanding Undergraduate Teaching Award.

The prestigious **Howard Hughes Award** sponsored by the American Helicopter Society (AHS) was presented to the TiltRotor Aeroacoustics Code (TRAC) Systems Development Team at the AHS Annual Forum in June 2002. Prof. Anastasios Lyrintzis is a member of this team. The AHS's Howard Hughes Award is given in recognition of outstanding improvement in fundamental helicopter technology.

Prof. Anastasios Lyrintzis has also been named a fellow of ASME.



Prof. Anastasios

Prof. Hyonny Kim

has been selected to participate in the ASEE/NASA Faculty Fellowship program during summer 2003 at the Langley Research Center.



Prof. Hyonny Kim

Discover Magazine Recognition of Prof. K.C. Howell

Prof. Kathleen C. Howell was named one of the "50 most important women in science" by Discover magazine in November 2002. Howell has worked with NASA's Jet Propulsion Laboratory to create an "interplanetary superhighway" a method that enables spacecraft to travel through the solar system by taking advantage of the gravitational attractions of the sun and planets. The technique provides pathways that can slash the amount of fuel used by spacecraft. "The gravity fields of the system's different objects create natural pathways that a spacecraft can follow," says Howell. The astronautical engineer and one of her graduate students designed such a trajectory for NASA's low-fuel Genesis probe, launched in 2001, which will collect samples of solar wind and return them to earth in September 2004. It is a pleasure to see the contribution of one our colleagues so appropriately recognized.



Prof. K.C. Howell

Continuing Engineering Education

Purdue University Schools of Engineering

provide opportunities for qualified individuals who wish to work towards a master's (MSE) degree in engineering at locations other than the West Lafayette campus. The School of Aeronautics & Astronautics (AAE) through Purdue University's Continuing Engineering Education (CEE) program, offers graduate level courses in aerospace engineering. It is possible to earn a non-thesis interdisciplinary Master's Degree in Engineering from Purdue University without visiting the West Lafayette Campus. By combining media-delivered courses with on-campus AAE courses, a student may earn a non-thesis M.S.E. or M.S degree from the School of Aeronautics & Astronautics with a limited-duration stay on campus. This combination of on-campus and remote-offered courses also provides the opportunity to earn a thesis-option degree from the School when combined with a research project. The potential also exists to pursue doctoral studies using this combination of distance education and on-campus courses and research. With our history of quality education, we are confident that the School of Aeronautics & Astronautics participation with Continuing Engineering Education will benefit all participants.

How You Can Participate

Continuing Engineering Education (CEE) offers to the practicing engineer, a range of graduate-level courses via videotape, satellite broadcast, and/or internet streaming video. These courses provide you with the opportunities to pursue a graduate degree in engineering or to enrich your technical background in area related to your career. You can take advantage of these courses from your worksite or your home without having to travel to the West Lafayette campus.

How to Register or Apply for Admission

Students may enroll in non-degree status to receive credit for a course while completing the full application for a degree-seeking admission. Non-degree enrollment does not guarantee admission as a degree-seeking student at a later time. Former Purdue University graduate students who have not registered with Purdue within the last calendar year or more, must submit a re-entry Graduate School Application. To apply for degree-seeking status for CEE's interdisciplinary MS or MSE degree, students should submit application materials to Continuing Engineering Education. To apply for degree-seeking status with the School of Aeronautics & Astronautics to pursue an MS, students

should submit application materials to the School of Aeronautics & Astronautics. If admitted to a master's degree program, students will establish a faculty advisor committee to assist in developing a plan of study.

Recently Offered Courses & Instructor

A&AE 550 Multidisciplinary Design Optimization

William Crossley

A&AE 615 Aeroacoustics

Anastasios Lyrintzis & Luc Mongeau

A&AE 514 Intermediate Aerodynamics

Anastasios Lyrintzis

A&AE 554 Fatigue of Structures and Materials

Alten F. Grandt Jr.

A&AE 539 Advanced Rocket Propulsion

Stephen D. Heister

A&AE 552 Nondestructive Evaluation of Structures and Materials

Alten F. Grandt Jr.

Additional AAE courses are planned for CEE in the near future. For a current schedule of AAE courses available through CEE, visit our web page at: aae.www.ecn.purdue.edu/AAE/CEE

Contact Information

PURDUE
UNIVERSITY

Continuing Engineering Education
Potter Engineering Center
Room 364
500 Central Drive
West Lafayette, IN. 47907-2022
Toll-free U.S. only: 877-598-4CEE
<https://Engineering.Purdue.edu/Engr/CEE>

Purdue University
School of Aeronautics & Astronautics
315 N. Grant St.
West Lafayette, IN. 47907-2023
Telephone: (765) 494-5152
<http://aae.www.ecn.purdue.edu>

Study Abroad Opportunities

Study Abroad programs are available to students in every major and include opportunities in more than 40 countries. The School of Aeronautics & Astronautics currently has agreements with England, France and Australia and has students from Purdue in these three countries and we are also acting as hosts for our overseas students. Program options include the entire academic year, a semester or summer session. More than 500 students participated in 2001-02 from Purdue and the

number is expected to grow. Purdue Study Abroad will also start to offer short-term, multiple destination programs during the summer.



James Fordham from Bristol University at home in Grissom Hall.

SCIENCE bound.



Science Bound Students from left Ashia Wilson, Milano Johnson and Jae Center from Crispus Attucks Middle School in Indianapolis.

GE and Indianapolis-area supporters are helping to bring new opportunities to students in the Indianapolis Public Schools district. The General Electric Fund announced in September 2002 that it will donate \$300,000 over the next three years to help support the Science Bound Program – a recent partnership between Purdue and the Indianapolis Public Schools (IPS)

Purdue President Martin C. Jischke initiated Science Bound in fall 2001. It is a program that helps underrepresented students to earn full scholarships to Purdue to study for a career in engineering, science, math, and technology and math/science education.

Students selected for the program are identified in the seventh grade on a variety of criteria, once selected; students take part in field trips, after school programs and summer camps. Each student is assigned an individual adult mentor-teacher.

Emeritus Professor John L. Bogdanoff



It is with sadness that we report the death Prof. John L. Bogdanoff on July 20, 2003

A native of East Orange N.J., Prof. Bogdanoff received the bachelor of mechanical engineering degree in 1938 from Syracuse University, the S.M. degree in applied mechanics from Harvard in 1939, and a doctoral degree from Columbia in 1950.

He joined Purdue University in 1950 as an associate professor and was one of the pioneers in developing the engineering sciences curriculum. He made the program at Purdue be among the first to be accredited in the United States. Retiring in 1986, his thirty-six year career saw our school grow from a fledgling program in Mechanical Engineering into one of the world's largest and most-renowned aerospace programs. He was Associate Head from November 27, 1967 to September 1, 1971 and Head from September 1, 1971 to January 1, 1973.

Prof. Bogdanoff had a long and illustrious research career in fields that included dynamics and applied stochastic and vibration. One of the pioneers in introducing stochastic methods of analysis in solving engineering problems, Bogdanoff remained an international authority in this field, and was author of numerous professional and technical articles in these fields. A Fellow of the American Society of Mechanical Engineers, he garnered many accolades. In 1975, he was elected to membership in the National Academy of Engineering, for "leadership in the introduction of stochastic processes into mechanical and civil engineering analysis."

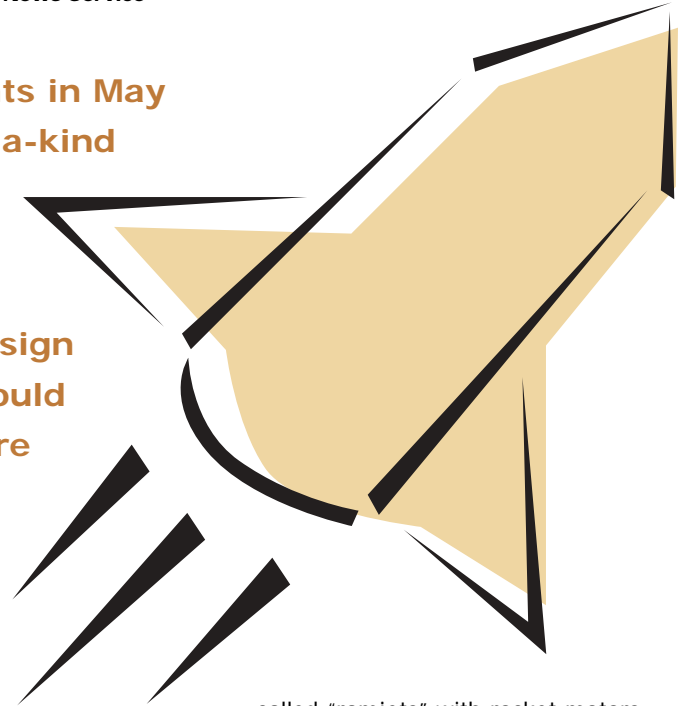
The fall 2003 launch of STS-117 has been put under review following the tragic events of February 1, 2003. School of Aeronautics & Astronautics alumni Mark Polansky BSAE '78, MS '78, OAE '99 had been named as pilot on STS-117, to continue assembly of the International Space Station. Polansky flew previously as pilot of STS-98, a 2001 International Space Station assembly mission when the science module Destiny was delivered. Frederick W. Sturckow will lead the six-member crew, with Polansky as Pilot, and mission specialist James F. Reilly II, Richard A. Mastracchio; Joan E. Higginbotham; and Patrick G. Forrester.

Mark Polansky

PURDUE STUDENTS USE RENOVATED LAB TO **test rocket designs**

By Emil Venere - Purdue News Service

Purdue students in May used a one-of-a-kind propulsion facility for NASA-funded research to design rockets that could end up in future "hypersonic" aircraft and spacecraft.



"These students have done a fantastic job," said Stephen Heister, a professor in Purdue's School of Aeronautics & Astronautics

The tests culminated a semester-long effort by about 25 seniors and graduate students in a course taught by William Anderson, an assistant professor in the School of Aeronautics and Astronautics.

Three teams of students in the "design, build and test" course created rockets from scratch and then tested them in the High Pressure Laboratory, one of six facilities at Purdue's Maurice J. Zucrow Laboratories. The rockets were bolted down and fired so that vital performance data could be recorded. Then the students analyzed the spent rockets to evaluate whether they performed properly.

William Escher, a senior systems engineer for Science Applications International Corp., a major defense contractor, was on hand to view one of the tests.

Escher said the students' work will help researchers develop "rocket based combined-cycle engines" in future aircraft that fly five times the speed of sound. These aircraft will combine advanced jet engines

called "ramjets" with rocket motors, giving them superior performance. Ramjets scoop air needed for combustion from the atmosphere, while rockets carry oxygen in a tank. In combined-cycle engines, a rocket motor will kick in where the ramjet leaves off.

The National Aeronautics and Space Administration is looking into using such engines for a new generation of spacecraft and will test the student design later this year, Anderson said.

"We are the only university that has students design, build and then fire bipropellant rocket engines as part of their class," said Anderson, a former NASA engineer. "The whole point is to give students real-world experience."

The newly renovated High Pressure Laboratory will perform research sponsored by NASA, the U.S. Air Force and U.S. Army, other federal agencies and aerospace companies.

"It's the most comprehensive and most capable university propulsion facility in which to test engines at higher pressures and thrust levels," said Heister, who has led efforts to refurbish the lab.



ASTRONAUT SCHOLARSHIP FOUNDATION

CREATED BY THE MERCURY 7 ASTRONAUTS

Congratulations to AAE senior Jayleen L. Guttromson who has been awarded an Astronaut Scholarship Foundation award for 2003-2004. The nominating faculty member was Professor and Associate Head Marc H. Williams who noted that in addition to her being a straight "A" student, she was an award winning co-op at NASA Johnson, and from Purdue University's Society of Women Engineers received the Outstanding Freshman; Sophomore and Junior Award for 2001, 2002 and 2003. She was also a leader of the SOLAR team and an outreach volunteer. The Astronaut Scholarship Foundation was established originally as the Mercury Seven Foundation in 1984 by

the six surviving members of the original Mercury Astronauts and Mrs. Betty Grissom, widow of the seventh, Purdue Graduate Gus Grissom, to foster space science education through scholarship awards. Alan B. Shepard Jr. was elected chairman and president. The purpose of the foundation is to provide scholarships to upper level college students and those going for masters of doctorates in the fields of science and engineering. The goal is to help the United States retain its world wide lead in science and technology. Scholarship money is raised through astronaut appearances, fund-raising events and corporate and individual donations. The ASF has gone from strength to strength and prides itself in organizing first class events to generate funds for its schol-

arship program. These events have become a significant fund-raising tool for the ASF raising thousands of dollars over the years. Gemini-Apollo astronaut James Lovell was elected to chairman and president in 1997. More than thirty astronaut members actively fundraise through paid appearances, special events, corporate and individual donations.

Jayleen in the vomit comet.



JOHNSON SPACE CENTER Engineering Career Expo April 2, 2003

The Engineering Career Expo, held at NASA Johnson Space Center, Houston, TX. was a wonderful chance for local high school students and parents to learn about what opportunities exist when pursuing a degree in a field of engineering. Represented at the event were space-related engineering companies, including Lockheed Martin, Boeing, Honeywell, and United Space Alliance, as well as colleges, such as Purdue University; University of Texas; Texas A&M; Arizona State University; Penn State; Georgia Tech; Michigan Tech; and University of Michigan. Aside from simply perusing



the booths, the students were also invited to attend one of the two presentations given by co-op students describing the life of a co-op, including how to become a co-op, what kind of work they do, and what schools are involved. A proud 5 out of the 12 students on the panel were hailing from Purdue! There appeared to be quite a few interested potential Boilermakers and that can be attributed in part to the wonderful information and goodies from the Aero and Astro department! Thanks!



Bahnsen and Grant with the Purdue Proud EMU (Extravehicular Maneuvering/mobility Unit).

By: Allison Bahnsen - Co-Op Student from the School of Aeronautics & Astronautics



The Purdue booth, put together by AAE Senior Allison Bahnsen and AAE Sophomore Mike Grant.

Grant, Bahnsen, Colleen Shea (ECE Sophomore), Angela Long (AAE Junior), Melanie Silosky (AAE Senior), and Jason Baumann (ECE Junior) at Purdue booth.

MISSION CONTROL FROM HOME

A must for space aficionados, a small company in Charlotte N.C., has turned hours and hours of NASA's original archival films and television transmissions from Apollo missions, and has digitally transferred and assembled them on sets of DVD's.

Spacecraft Films currently offers DVD sets of the first moon landing mission, Apollo 11, and the Apollo 14 mission to the Fra Mauro highlands. The sets are available from www.spacecraftfilms.com

www.spacecraftfilms.com



Brian Ventre and the Southport Elementary fifth grade class outside of ASL.

K-12 Educational Outreach *Visit from Southport Elementary School*

A highly successful visit to campus took place on Friday May 2, 2003 by Mrs. Sue Magee's 5th grade class from Southport Elementary School in Perry Township. A&E junior Brian Ventre led the 24 students and 6 chaperones on a tour of the Aerospace Science Laboratories where he gave them the run down on the Drop Tower, Boeing Wind Tunnel, Water Table, and Shock Tube. He explained the Mach 6 Ludwig tube and the facilities in the Zucrow laboratories. Brian volunteered at the start of the academic year to lead the job shadowing and educational outreach for the school and is to be commended for the excellent job he has done this year.



Congratulations to the graduates from the School of Aeronautics and Astronautics:

winter 2002

Winter commencement took place on Sunday December 15, 2002 where 2,172 undergraduates and 828 in graduate or professional programs were candidates for graduation. Purdue President Martin C. Jischke reminded graduates to believe in themselves, never fear failure, work well with others and reach for the stars.

BSAAE

Greg Bischoff
Paul Brower
Ke-Winn Chan
Jit-Tat Chen
Rohan Dudley
Thomas Fosness
Kristin Gates
Melissa Glaser
Heather Grehan
John Hawkins

Michael Hrach
Ryan Lash
David Loffing
Javier Lovera
Thomas Martin
Brett Northcutt
Nicholas Nugent
Michael Perotti
Yin Fee Phang
Tim Sanders
Colin Sipe

Anthony Spidale
Rory Toombs

MSAAE

James Canino
James Gregory
Govindarajan
Kothandaraman
Erick Swanson
Michael VanMeter

Ph. D.

Ahmet Acikmese
Wyatt Johnson
Byoungdoo Kim
Un-Taik Kang
Suk Goo Yoon

The 187th commencement at Purdue University took place on the weekend of May 17, 2003. The Schools of Engineering held their ceremony in the Elliot Hall of Music on Saturday May 17 at 2:00 pm. Earlier in the day the Schools of Engineering held an "Engineering Send Off" in the Memorial Mall with all 13 Schools represented. Congratulations to the graduates from the School of Aeronautics and Astronautics to the following students:

spring 2003

BSAAE

Matthew Adkins
Stephen Bash
Alex Bohnert
Matthew Bouton
Eric Briggs
Daniel Brophy
Laurel Brown
Enrique Chapoy
Douglas Crook
David Dafler
Kevin Darkes
Jeffrey Decker
Louise-Olivia Djibo
Brenda Eichel
Charles Fisher
Joshua Fredlake
John Gedmark
Joseph Ghesquiere
Cristina Gordon
Jessica Grimes
Jason Gromski

Christopher Habel
Joseph Harber
Jimmy Hidayat
Victoria Hoyle
James Hoyt
Rebecca Kacvinsky
Whitney Kolbert
Jin Yong Kong
Valerie Kost
Fred Kuipers
Adam Ladd
Steven Lamberson
See-Chen Lee
Jason Lucas
Muharreh Mane
Michael Marando
Samantha Martinez
Ravishankar Mathur
Kevin Miller
Aaron Murphy
Elizabeth Newsome
Carly Northam

Chieh Min Ooi
Geoffrey Osier
Brandon Owens
David Page
Heather Pawley
Gina Pieri
Robin Pinson
James Pinyerd
Brian Reitenour
Raymond Scholz
Joseph Sherrick
Michael Shockling
Michael Skillen
Jonah Skoog
Stephanie Steber
Matthew Stout
Travis Tanner
Jordan Taylor
Daniel Trigg
Jeffrey Troester
Emily Vaughan
Kevin Wade

MSAAE

Joseph Kuan-Hua Chen
Donald Dyer
Shannon Fitzpatrick
Karl Garman
Michael Koenigs
Timothy Norman
Jeffrey Rodrian
Brian Roth
Selim Solmaz
Min-Cheng Tu
Mark Ward

Ph. D.

Tae-Jun Kwon
Jae Seong Park
Umamaheswar Turaga

august 2003

Congratulations to the graduates of the 188th graduation ceremonies which took place the weekend of August 8, 2003.

BSAAE

Charles Barr
Kevin Darkes
Quinn Miller
Jonah Skoog

Jeffrey Troester
James Watson
Yen Ching Yu

MSAAE

John Dankanich
Arvind Krishnan
Damon Landau

MSc.

James Sisco

Ph. D.

Yongkang Chen

Commencement

STUDENT *awards*

NASA JSC Co-op Special Achievement Awards and Co-op Flag Awards

Out of more than 60 students who worked at JSC during spring 2002, 21 students were nominated for an award. Of those nominated, 9 received Special Achievement Awards and 9 received Flag Awards.

Jayleen Guttromson received a Co-op Special Achievement Award, which included a check for \$500.

Out of more than 86 students who worked at JSC during summer 2002, 42 were nominated for an award. Of those nominated, 13 received Special Achievement Awards and 25 received Flag Awards.

Paul Brower and Melanie Silosky received a Co-op Special Achievement Award, which included a check for \$500.

Allison Bahnsen, Jacqueline Jaron, Kevin Miller and Ryan Whitley received a Flag Award, which includes a certificate with a mounted flag that has flown on board an Orbiter.

John F. Matlik received the Best Student Paper Award at the 44th AIAA/ASME/ASCE/ AHS Structural Dynamics and Materials Conference in Norfolk, VA. His paper was entitled "High Temperature, High Frequency Fretting Fatigue Investigations."

2003 PRF Summer Research Grant

Sureshkumar Kalyanam
Jeesoon Kim

2003 - Herbert F Rogers Scholarship

Gina Pieri
John Gedmark

2003 – Koerner Scholarships

Michael J. Grant, sophomore
Debanik Barua, junior
Jayleen Guttromson, senior
Michael Shockley, senior
Melanie Silosky, senior

2003 – Magoon Graduate Teaching Award

Ajit Achuthan
Michael Koenings
Shin Matsumura
Christopher Patterson
Stephanie Van Y

2003-2004 Astronaut Scholarship Foundation Mercury 7 Award

Jayleen Guttromson

2003 Elmer F. Bruhn Undergraduate Research Assistantship

Yen Ching Yu
Lucia Capdevila

2003 John and Patricia Rich Scholarship

David Berger Jr.
John Gedmark
Ryan Irwin
Ryan Whitley.

2003 Outstanding Graduate Teaching Assistant

Chris Patterson

GE Student Intern Co-op Contribution Award (SICCA)

Jennifer Watson

Korean American Scholarship

Charles Park

Society of Women Engineers Award

Jayleen Guttromson

2003 Hsu Lo Fellowship

Hia-Yang Quain

Gary and Sue Payton Scholarship

Arthur Remson Memorial Scholarship

Russell Cedars Memorial Scholarship

Winners of the AAE 251 ATK Thiokol Propulsion SP.A.C.E. Awards

Spring 2002 – First Place Team



David McGrath BSAAE '83, MS '84 manager ATK Tactical Systems and IAC member presents awards to student winners of Design 251 competition September 20, 2002.

L-R David McGrath; Whitney Jackson; Wade McMillan; Pat Nelson; Gretchen Rybarczyk Allison Bahnsen; Prof. Bill Crossley

Fall 2002 – First Place Team



L-R Andrew Bean; Mike Carpenter; Mark French; George Pollock; Zade Shaw; Charles Weaver, David McGrath, ATK.



Matthew Ernst

Society of American Military Engineers Award (ROTC)

Matthew R. Ernst

Distinguished Students

The following students earned Semester Honors or Dean's List in either Spring or Fall Semesters of 2002.

Maizakiah Ayu Abdullah
Matthew Guy Bagg
Justin James Bailey
Christopher Patrick Barder
Debanik Barua
Stephen C. Bash
David Eugene Berger Jr.
Christopher J. Bies
Scott Christopher Bird
Avanthi Boopalan
Anthony Wayne Bradford
Eric Bradley Briggs
Daniel John Brophy
Laura Beth Brower
Laurel Jeanne Brown
Peterson Lee Browning
Drew Michael Capps
Ariane Brooke Chepko
Louis-Olivier Croisetiere
Douglas D. Crook
David Wesley Dafler
Kevin Alan Daly
Joseph Thomas Davis
Jeffrey Philip Decker
Lloyd J. Droppers
Matthew Ross Ernst
Joseph Michael Ewing
Joseph James Fallon
Robert Henry Fink
Charles David Fisher
Lucia Rut Capdevila Fogel
William Joseph Fredericks
Joshua James Fredlake
Leo Timothy Gard
John William Gedmark
Dawn Perry Gordon
Michael James Grant
Daniel John Grebow
Jason Michael Gromski
Eric Daniel Gustafson
Jeffrey Wayne Haddin
Franklin L. Hankins III
Joseph Robert Harber
Gregory Andrew Henning
Jimmy Hidayat
Kelli Pei-Chun Hsieh
Bradley Jonathan Hurwitz
Jared Kenneth Hutter

Robert Jason Icona
Ryan William Irwin
Jacqueline Marie Jaron
Cyril Cherian Jos
Manasi Shrikant Joshi
Joshua Wayne Jung
Melanie Jean Jura
Brady Evan Kalb
Teng Thuan Khoo
Noah Christopher Kobin
Jeffery Richardson Komives
Jamie Elise Krakover
Fred Mark Kuipers
Adam Franklin Ladd
See-Chen Lee
Kai Hui Leong
Gerald Lo
Angela Lynn Long
Hafid Abas Long
Gerald Long
Jason Peter Lucas
Robert Beresford MacDermott
Muharrem Mane
Robert Edward Manning
Daniel Timolat McCaffery
Wade Virgil McMillan
Christopher James Miller
Quinn Gluek Miller
Kevin Joel Miller
Kathleen Marie Mondino
Douglas Joseph Mousseau
George Nadim Mseis
Anthony Douglas Muzzillo
Christian Robert Naylor
Eamonn James Needler
Patrick Arthur Nelson
Elizabeth Maria Newsome
Brett Gordon Northcutt
Chieh Min Ooi
Geoffrey Scott Osier
Brandon Dewain Owens
David Andrew Page
Benjamin Keith Parkison
Heather Nicole Pawley
Benjamin David Phillips
Gina Lee Pieri

Robin Marie Pinson
James Thomas Pinyard
George Edward Pollock
Brian James Pramann
Timothy Peter Vander Pyl
Colleen Emily Rainbolt
Brian Allen Reitenour
Samuel Cole Rodkey
Anthony Allan Sanders
Brian Frederick Schoening
Raymond William Scholz
Heng Keon Kelvin Seah
Gaetano Luca Settineri
Zade Latif Shaw
Jonthan Paul Shearer
Michael Anthony Shockling
Cyrus Sigari
Melanie Lynn Silosky
Aaron David Sippel
Michael Dean Skillen
Kyle Steven Smith
Austin Lon Smith
Ryan Lenard Spalding
John E. Stalbaum
Christopher Eugene Statler
Stephanie Lynn Steber
Matthew Damon Stout
Eng Kee Ian Tan
Jordan Ashley Taylor
Emil Edmond Tchilian
Rolf David Tellefsen
Bradley James Thompson
Benjamin Michael Toleman
Christopher Lee Speciale Ulrich
Sarah Augusta Umberger
Brian David Ventre
Kevin Lloyd Wade
Jennifer N. Watson
Nicholas Roland White
Ryan James Whitley
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James Robert Wills
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Congratulations to our Outstanding Students

The Outstanding Student Award

The Purdue Engineering Foundation sponsored a new award to seniors graduating December 2002. Prof. Tom N. Farris presented senior **Paul Brower** with the Outstanding Student Award during the winter graduation ceremonies of 2002.



The Outstanding Senior Award

Each year the Aeronautics Honorary Society, Sigma Gamma Tau, sponsors the outstanding senior award. The nominees are selected by the faculty, and the Outstanding Senior is selected by a student vote. The nominees were: Douglas Crook; Kevin Miller; Elizabeth Newsome; Gina Pieri; and Michael Shockling.

And the winner is . . . **Gina Pieri**

2003 Outstanding Graduate Student - Jeff Rodrian



Jeff Rodrian and Gina Pieri at the spring commencement ceremonies 2003.

Allison Bahnsen leading the Edible Space Station activity.



Fall Space

VIP Guest Colonel John H. Casper

A living piece of Purdue University aeronautical history provided a glimpse to over two hundred seventy elementary students about the current status and the future of the International Space Station. Casper and his wife Mrs. Beth Casper were the VIP guests of the 7th annual Purdue Fall Space Day organized by the School of Aeronautics & Astronautics and the Purdue chapter for Students for Exploration and Development of Space. (SEDS) Student Director Gina Pieri chose this year's Fall Space Day theme from astronaut Christa McAuliffe's quote of December 6,

1987: "It's everybody's business to know about space." Col. John H. Casper, who graduated from Purdue in 1967 with a master's degree in astronautics, has flown aboard four space shuttle missions' beginning in 1990. Casper has logged over 825 hours in space.



Col. John H. Casper
photo courtesy of NASA.

The elementary students came from invited schools within a 60-mile radius of the West Lafayette campus. They took part in a full day of hands-on activities which were all related to aerospace engineering. The 85 strong volunteer crew of Purdue students led the twelve groups of elementary students who, this year were named after a star system. "We all enjoy talking and working with

the students," said Brian Ventre, a junior majoring in aerospace engineering. "We have as much fun as the kids do. That's one of our goals. I'm one of those people that have always had an interest in space. Now I am starting to live it and pass it on." The elementary students participated in three age-related activities in three time-slots. Casper finished off the day encouraging the young



John Casper presents a plaque
to Gina Pieri.



4th graders enjoying Fall Space Day.



Day

students, "I want to encourage all the young folks here if you're thinking, 'What do I want to do with my life?' I would challenge you to come for the space program," said Casper, "When I was eight years old, it was my dream.



Bryon Dispennett & Kayla Schultz welcome the students.



Mrs. Beth Casper lends a hand.

(And) it's where the future is." Both Col. & Mrs. Casper enthusiastically took part in the activities and were very generous with their time and encouragement to the both the elementary and Purdue students. Purdue Fall Space Day was sponsored by the Indiana Space Grant Consortium; Pratt & Whitney; Students for the Exploration and Development of Space (SEDS); the American Institute for Aeronautics and Astronautics (AIAA); and the School of Aeronautics & Astronautics.

Purdue Fall Space Day 2003 is planned for Saturday October 25, 2003 with honored guest VIP Col. John E. Blaha.



Col. John Casper with the Purdue Crew.



Tim Bobillo

Aero Advancement

I love my job! And, apparently, so does my son, Chas. While driving Chas and his friends to baseball practice I overheard the following conversation about the future career plans of these 11-year olds.

"I'm going to be an engineer."
"I'm going to be a baseball player."
"I want to be an architect."
"Me too!"
"What do you want to do, Chas?"
"I want to do what my Dad does."
"What does he do?"
"He goes to parties and takes people to lunch and dinner."

The School of Aeronautics & Astronautics continues to move forward. The students choosing aerospace engineering are outstanding. Our faculty is committed to excellence in the classroom and laboratories. And the whole thing runs smoothly because of our wonderful staff.

And my role is to go to lunch or dinner with you! More precisely, to help you stay connected to your alma mater. It is my job, and my pleasure, to help you continue your experience with Purdue and the School of Aeronautics & Astronautics. The magnificent reputation the school enjoys is due to your success. I believe, and you may agree, that your success derives in some part to your Purdue education. So the school moves forward to educate and prepare another generation of aerospace engineers. And I will assist you in maintaining your relationship with our faculty, our students, and each other.

The need for financial support of our school is great. Your contributions do make a difference to us and help us in achieving our mission in teaching, research and service. Our annual Donor Honor Roll lists our alumni and friends who have given generously of their financial resources to support the School of Aeronautics and Astronautics.

Many thanks for your investment in us. Listed on the following pages are those alumni and friends who have generously donated to the school during the period July 1, 2002 to June 30, 2003. Many thanks.

Our progress will be enhanced by the Campaign for Purdue. Our strategic plan very clearly identifies our goals, and our success in the Campaign will provide the financial resources needed to achieve those goals.

Quite simply we will raise \$18M by July 2007. The capstone of our efforts is the new multidisciplinary engineering building that will be our new home. With the State of Indiana's \$37.7M commitment combined with \$10M in private funding, we plan to break ground this year and move into our new home at the corner of Stadium and Northwestern in 2006. A very aggressive plan made possible by your generosity.

The following alumni and friends have led the way with their early leadership. They will be appropriately recognized at a later time, but I would like to thank them now for stepping up and leading the way.

K.O. Johnson, Mike and Madeline Kennedy, John Rich, Tom and Mary McKane, Ed and Hilah Dorsey, Bob and Mary Jo Kirk. Thank you for your leadership. Many others will be inspired to give because of your example. As I continue to travel to meet our alumni, I am thankful for being in a position that allows me to have an impact on the lives of many students and alumni. You can have an impact with your participation with the school and by contributing to the future success of the school. I look forward to seeing you. Maybe we can go to lunch or dinner...

I love this job!

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Your friends and former classmates want to know what is happening in your life. Please jot down personal news that you want to appear in the next edition of AeroGram and either email it or send to the address below. Our goal is to keep you abreast of the activities in the School of Aeronautics & Astronautics and across Purdue University. We hope that you find this information useful and relevant. We want to keep in touch with all our alumni and friends and we have plans to circulate an E-newsletter. If you would like to sign up to receive this publication, please email us at the following email address: aae-alumni@ecn.purdue.edu

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