AErospace at Georgia Tech

News from the Daniel Guggenheim School of Aerospace Engineering

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Alumni News

The following updates and items of interest were submitted to the School of Aerospace Engineering at Georgia Tech and/or to *Tech Topics*, a quarterly publication of the Georgia Tech Alumni Association. We'd like to know what you've been up to! Send information updates to: alumninews@aerospace.gatech.edu or by fax to 404.894.2760.

1960 – 1969

Harold Ritchie, '67, has become a registered civil engineer in the state of California. He is a civil engineer for the City of San Diego and lives in El Cajon, California, with his wife, Juanita, and two children, Joaquin and Mariana.

1980 – 1989

Marianne Ashley Gardner, '84, was recently promoted to Systems Engineering manager at Lockheed Martin Space Systems in Sunnyvale, California.

1990 – 1999

Eric Brown, '91, recently accepted a position with Accenture as a manager of Supply Chain Consulting. Eric, his wife, Stephanie, and their two children, Alexandra, four, and Mitchell, one, currently reside in Ridgefield, Connecticut.

William David "Fuzzy" Wells, '91, an Air Force major from Colorado Springs, Colorado, graduated from the Naval Postgraduate School with his doctorate in modeling, virtual environments, and simulation, in September. Wells is director of operations research and an assistant professor of computer science at the U.S. Air Force Academy.

Michael Knight, '96, and his wife, Clarissa Knight, '96, are proud to announce the birth of their second child, Jake Alexander Knight, born October 23, 2004. Jake joins older sister Suzanna Madison Knight, born March 16, 2002. The family lives on Wilmington Island, Georgia. Michael is employed at Gulfstream Aerospace in Savannah in the Preliminary Design Department.

continued on page 7

Chair's Column

Robert G. Loewy, Chair
William R.T. Oakes Professor

The two components of "aerospace", aeronautics and space technology, have always been complementary as elements of engineering enterprise. As one indication of this complementary relationship, we often note that even a spacecraft not intended to return to the Earth must pass through the Earth's atmosphere on launch. Furthermore, many of the enabling technologies, such as light, strong structures, high-temperature-capable materials, and feedback control systems, are common to both aeronautics and space applications. One could, of course, name many more. But tension between the two—aeronautics and space—has unfortunately also existed from the start, generated by the finite resources available to support them both. In fact, when the premiere aeronautical research organization in the U.S., the National Advisory Committee for Aeronautics (NACA), which was created in 1915, metamorphosed into the National Aeronautics and Space Administration (NASA) as a result of the Soviet Union's success with Sputnik in 1957, some "wags" said the change was from NAC$_{LA}$ to NA$A.

The differences in the natures of these two sides of NASA have made and continue to make for huge differences in the associated operating budgets. In fiscal year 2004, for example, out of the $15.2 billion total NASA expenditures, 95.8 percent was for the space side and 4.20 percent was for the aeronautics side. To understand these proportions it is helpful to remember that on the space side, NASA is the one federal agency that designs, develops, and operates all non-military spacecraft. On the aeronautics side, NASA conceives and conducts research that provides important new information and methods, but it is the aeronautics industry that designs and develops aircraft, and other—and for the most part, private—agencies (the airlines, oil companies, hospitals, etc.) that operate the resulting aircraft. The differences in those functions make it clear that the aerospace industry views NASA as a customer to be assiduously cultivated in the space arena and as an advisor in aeronautics activities—an advisor that, in some ways, must be kept at arms' length lest some new federal regulation result, which could hinder industry operations. Military developments and operations of both aeronautics and space vehicles, of course, are of essential importance to the nation. Our armed services, i.e., those in the Department of Defense (DoD), accordingly do both, but how much the DoD does tends to wax or wane as our Congress and administration perceive threats to our security as greater or less.

According to "Review of the U.S. Department of Defense Air, Space and Supporting Information Systems Science and Technology Program," a 2001 national Research Council Report from the National Academy Press, "At the start of the 21st century, the Air Force air system S&T (Science and Technology) budget was less than half its level only 10 years earlier." On the other hand, the Air Force plans "to double the percentage of its total S&T investment that is oriented toward space." And although a "large part of the increase…appears to be due to the Air Force's transfer of the relatively large Space Based Laser and Discoverer II space-based radar programs, previously considered to be demonstration validation programs into S&T appropriation," the Air Force's "planned space S&T investment will be about the same five years from now as it is today."

On the NASA side, the Federal Research and Development budget authority dropped from $1.057 billion in 2004 to $0.852 billion in 2006, whereas the sum of NASA budget authority for science and exploration systems grew from $5.6 billion in 2004 to $8.641

continued on page 3

AE Celebrates 75th Anniversary

The School of Aerospace Engineering celebrated on December 8, 2005, the 75th anniversary of the Guggenheim Foundation Grant, which established the Daniel Guggenheim School of Aeronautics at Georgia Tech on March 3, 1930. The $300,000 grant was the last and third-largest grant made to seven institutions across the United States for the establishment of centers for aeronautical research and instruction. These centers were chosen to represent various geographical regions, and the Southeast was the final region to be represented by Georgia Tech. Primary use of the grant funds was for the Guggenheim Building, which was dedicated on June 8, 1931. It is a commentary on the impact of inflation and the cost of computers and audio-visual aids that the $91,000 Guggenheim Building built on the Georgia Tech campus in 1930 was renovated in 1996 for more than $2.5 million. To better reflect the School's growing and expanding interests and responsibilities beyond the field of aeronautics, its name was officially changed to the School of Aerospace Engineering effective July 1, 1962.

The anniversary celebration included an entire day of activities: tours, a speakers' luncheon, and a seminar followed by a reception. A number of distinguished guests and alumni attended the festivities. The popular seminar attracted a large number of faculty and students, resulting in a "standing room only" audience.

The Honorable Sheila Widnall, Institute professor at the Massachusetts Institute of Technology and a former Secretary of the Air Force, gave the keynote address: *Reshaping the Passion: Aerospace Yesterday, Today, and Tomorrow*. Other distinguished speakers included Dr. John Anderson, historian at The Smithsonian Air and Space Museum; Dr. Scott Horowitz, AE Ph.D. '82, astronaut and associate administrator for Exploration Systems: Mission Directorate, NASA; and Dr. Don Richardson, BSAE '51, retired corporate vice president of the SAIC Corporation and recently president of the AIAA.

During the seminar, Mark Miller, vice president of Research and Engineering for the Sikorsky Aircraft Company, announced the establishment of the new AE Sikorsky Professorship and presented a check for the associated endowment to Dr. Don Giddens, dean of Georgia Tech's College of Engineering. Dr. Mark Costello has been appointed to this professorship, and an article welcoming him to AE is included in this publication (see page 4). Dr. Costello was introduced to the audience, as was Dr. Sergei Sikorsky, son of the founder of Sikorsky Aircraft and a retired vice president of the company.

BSAE International Plan

Dr. L. N. Sankar
Associate Chair,
School of Aerospace Engineering

The aerospace industry is joining the most widely separated nations. Non-stop "jet smooth" flights to every corner of the world are now commonplace, bringing about an exponential growth in international travel, tourism, and commerce. Joint initiatives such as the International Space Station are also bringing the nations of the world together in a common endeavor to increase the resources and brain power available to understand and conquer space, the next great frontier. Collaborative efforts among aerospace industries, once frowned upon because of security or proprietary considerations, are now commonplace. Boeing is having the wings for its latest jet, Dreamliner 787, manufactured in Japan with advanced supercritical airfoils and composite technologies. China is manufacturing horizontal tail sections, vertical fins, and other tail section modules for the Boeing 737. Bell Helicopter, a unit of Textron, is collaborating with Italy's AugustaWestland in the design and manufacture of next-generation VTOL vehicles. Westinghouse and Siemens recently merged and are developing and manufacturing next-generation power systems. The list of such international collaboration is virtually endless, if one includes the collaborative efforts between aircraft and spacecraft component designers and system integrators.

Until recently, the United States held a preeminent position in aerospace technology, and engineers from other countries flocked to the United States to learn and understand our engineering, business, and environmental practices. Our industry's positive contribution to the balance of trade of our nation with others is the largest of all business segments and has justifiably been a source of pride for aerospace engineers. However, such a one-sided exchange of ideas and technology is no longer feasible, nor is it desirable, if the United States is to retain its role as the preeminent developer and provider of aerospace technology. In order to participate and compete in this global marketplace, it is now necessary for our engineers to be able to speak one or more European or Asian languages, and have an increased understanding and appreciation of global history, politics, economics, and cultures, in addition to understanding technological and environmental issues.

Recognizing the need for the development of global competence in our engineers, Georgia Tech's School of Aerospace Engineering made the internationalization of aerospace engineering a major goal of our 2001 Strategic Plan. Over the past five years, the School has been participating in study abroad programs and offering aerospace engineering courses in Russia, Oxford University in England, and at the Georgia Tech Lorraine campus in France. As a second major step in internationalizing our program, the School collaborated with Georgia Tech's Office of International Education to develop and begin offering a Bachelor of Science in Aerospace Engineering (BSAE) International Plan degree in the fall of 2005. Our School is one of the first Georgia Tech schools to offer a specialized international bachelor's degree.

The BSAE International Plan has four major elements:

- Students must demonstrate competence in a foreign language. This may be done by taking two years of foreign language either at Georgia Tech or in high school. The B.S. program provides many hours of electives so that this BSAE requirement may be completed without increasing the total number of undergraduate program hours (132). Students who satisfied the language requirements elsewhere must pass a competency test administered

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Chair's Column *continued from first page*

billion in 2006, according to "Aerospace Facts & Figures: 2005-2006" by the Aerospace Industries Association in Arlington, Virginia.

The recent public statements of government leaders in Europe, on the one hand, and in our country, on the other hand, make for an interesting comparison. In 2002, a group of European nations announced a twenty-year plan to become the world's leader in aviation.[1] In 2004, President Bush announced a plan for space exploration, funded by Congress in 2005 in the amount of $16.5 billion, to return to the moon, and go on to Mars, ultimately, and beyond.

Georgia Tech's School of Aerospace Engineering (AE) faculty and staff, in response to requests from national organizations, have within the last year contributed substantially to studies seen as important to coming to grips with what seem to be the conflicting goals that are associated with this kind of comparison.

The Presidential Commission chaired by Edward "Pete" Aldridge (AE MS '62) held its second public hearing in reaching its recommendations for a national response to the President's space exploration initiative on Tech's campus in April, 2004. AE Professor N. Komerath testified, as did AE student Daniel Hegeman, the only student asked to appear in that hearing. When NASA's new administrator, Michael Griffin, organized a study team in the summer of 2005 to formulate an action plan for this space exploration initiative, known as the Exploration Systems Architecture Study (ESASA), he asked that it be led by Dr. Douglas Stanley, a senior Georgia Tech research engineer assigned to the Tech group, led by Langley Professor Dr. Alan Wilhite, at the National Institute for Aerospace (NIA). Dr. Stanley did so, to considerable praise from all involved.

Somewhat earlier, when the U.S. Congress asked the NIA to lead the development of a five-year aeronautics research plan and budget for NASA, AE at Georgia Tech played a pivotal role in that study as well. In that instance, a National Strategy Team, with $5 million in resources and an April 2005 deadline assembled seven sector teams composed of "more than 250 of the nation's aviation experts from industry and academia" to determine "schedules, milestones and funding of the aeronautics technology required to address America's needs," according to the April 2005 NIA report "Responding to the Call: Aviation plan for American Leadership." The tremendously challenging task of integrating the resulting volume of output into a cohesive report was assigned to a team from Georgia Tech's Aerospace Systems Design Lab (ASDL) under the direction of Professors Dimitri Mavris and Dan Schrage. Perhaps the best indicator of the esteem in which that Integration Team's work was held is the fact that in the study's Executive Summary, the ASDL team's listing is side by side with that of the National Strategy Team.

In addition to the excitement and importance of expanding our knowledge of the universe through space science, the practical side of space operations cannot be overlooked with impunity. The application of satellites to navigation (GPS), communications (telephony and TV), weather forecasting, earth surveillance, etc., all call for a burgeoning U.S. space enterprise. Similarly, the essential nature of advances in aeronautics to the nation's economy and defense, our citizens' quality of life, and to the environment must also be carried forward to preserve the standing of the U.S. in world affairs. How well the nation will balance these endeavors is not yet clear. What is clear, however, is that virtually day by day AE at Georgia Tech is becoming more involved and its people a stronger and more pervasive influence.

1 For example: the "Report of the Group of Personalities, European Aeronautics: A Vision for 2020" states, "In 2020, European Aeronautics is the world's number one. Its companies are celebrated brands, renowned for the quality of products that are winning more that 50% shares of world markets for aircraft, engines, and equipment."

BSAE International Plan *continued from page 2*

by the School of Modern Languages.

- Students must satisfy a core set of courses that address international relations, global economy, and regional history. Again, these requirements may be satisfied with the social science elective hours available in the undergraduate program (9, plus a 3-hour course on U.S. history or the *Constitution of the United States*).
- Two terms (a minimum of 26 weeks) of residential foreign experience is needed. The two terms may consist of any combination of full-time academic study, internship with industry or government, or research under careful planning by AE academic advisors.
- Students must apply their knowledge of language, international history, culture, and environmental issues in their two-term-long capstone design projects on the Georgia Tech campus during their senior year. Students are expected to prepare an appendix to their senior year design projects addressing how their designs address or could be improved to meet the environmental and market requirements of the nations that they visited, and discussing the opportunities for collaboration with those nations in the design, manufacturing, and marketing of their products.

The School of Aerospace Engineering is currently in the process of establishing a Memorandum of Understanding with leading educational institutions around the world to facilitate a free flow of ideas, allow for Georgia Tech students to more easily study abroad at other universities, and to identify mentors to advise and oversee Georgia Tech students while they are abroad. We are also exploring internship opportunities abroad in exchange for training the students from partner schools in our own labs and industries. Already 12 freshman students (out of a total of 201) have enrolled in this program. We expect the number to grow as students, parents, and employers learn more about the program and the extraordinary benefits that it offers. We look forward to working with students, parents, faculty members, employers, and members of professional societies to continually assess and improve the elements of this program. Your comments and suggestions are certainly most welcome.

AE Welcomes New Faculty

Dr. John-Paul Clarke

Dr. John-Paul Clarke joins the School of Aerospace Engineering at Georgia Tech as an associate professor from a faculty position in the Department of Aeronautics and Astronautics at the Massachusetts Institute of Technology (MIT). He earned S.B., S.M., and Sc.D. degrees in aeronautics and astronautics from MIT in 1991, 1992, and 1997, respectively. Prior to his appointment there, he served as a visiting scholar at The Boeing Company in Seattle, Washington, and as a member of the technical staff at the NASA Jet Propulsion Laboratory in Pasadena, California.

Clarke serves on several national and international technical committees, including the Aeronautics and Space Engineering Board of The National Research Council, the Federal Aviation Administration (FAA) Research Engineering and Development Committee, the American Institute of Aeronautics and Astronautics (AIAA) Air Transportation Systems Technical Committee, and the Society of Automotive Engineers Aircraft Noise Committee.

He is an associate fellow of the AIAA and has been an AIAA distinguished lecturer since 2002. In addition, he is a member of the Airline Group of the International Federation of Operations Research Societies, the Institute for Operations Research and the Management Sciences, the Institute of Navigation, and Sigma Xi, the scientific honor society.

Clarke's research and teaching address issues of optimization and robustness in aircraft and airline operations, air traffic management, and the environmental impact of aviation. His addition to the faculty of the School of Aerospace Engineering will facilitate the School's growth in the area of systems design and optimization to include the influence of technical issues associated with the broader air transportation system.

He has contributed chapters to three books, has published numerous articles in refereed journals and conferences proceedings, and has given invited lectures in more than fifteen different countries. His many honors include the Theodore Von Karman Teaching Fellowship, the AIAA/AAAE/ACC Jay Hollingsworth Speas Award, and the FAA Excellence in Aviation Award.

Dr. Mark Costello

Dr. Mark Costello earned a B.S. degree in aerospace engineering from Pennsylvania State University in 1987, and M.S. and Ph.D. degrees in aerospace engineering from the Georgia Institute of Technology in 1989 and 1992, respectively. He joins the School of Aerospace Engineering at Georgia Tech as the Sikorsky Associate Professor in Rotorcraft Technology after an extensive search on the part of our School to fill this position, which was endowed through the generosity of Sikorsky Aircraft, a division of United Technologies.

Costello most recently spent eight years on the faculty of the Department of Mechanical Engineering at Oregon State University. Prior to his appointment at Oregon State, Costello served on the faculty of the United States Military Academy at West Point within the Department of Civil and Mechanical Engineering. He also worked as a research engineer in the Helicopter Division of The Boeing Company and on rotorcraft research for the Georgia Tech Research Institute. He has earned national recognition for a substantial research program in the development of innovative flight mechanics and controls technologies for a variety of flight vehicles, including rotorcraft.

Costello is an associate fellow of the American Institute of Aeronautics and Astronautics as well as a member of the American Helicopter Society and the American Society of Mechanical Engineers.

As the Sikorsky Associate Professor in Rotorcraft Technology, Costello will serve as the associate director of the Georgia Tech Center of Excellence in Rotorcraft Technology and will be in a leadership position for a major program of instruction and research devoted to the advancement of rotorcraft technology.

Dr. Eric Feron

Dr. Eric Feron earned a B.S. degree in mathematics from the Ecole Polytechnique in 1989, an M.S. degree in computer science from the Ecole Normale Superieure in 1990, and a Ph.D. in aeronautics and astronautics from Stanford University in 1994. He joins the School of Aerospace Engineering at Georgia Tech as the Dutton-Ducoffe Professor of Software Engineering, an endowed position funded by the Institute's capital fund campaign, which ended in the year 2000. Feron earlier held a faculty position in the Department of Aeronautics and Astronautics at the Massachusetts Institute of Technology (MIT), where he was appointed to the C.S. Draper Chair in 1993. Prior to working at MIT, he was an engineer with the Ministry of Defense in France.

The author or co-author of more than 110 refereed publications, two books, and five patents (current or pending), Feron is a current or past associate

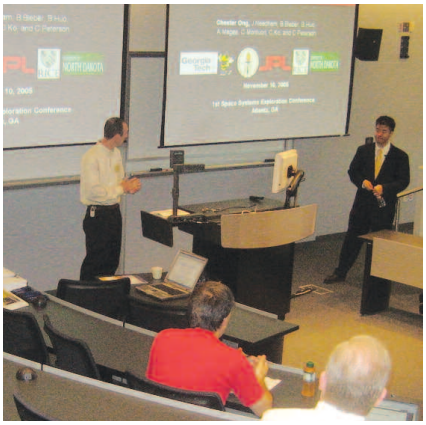
continued on page 6

First Annual Space Systems Engineering Conference Held at Georgia Tech

An Inaugural Space Systems Engineering Conference was held at the Global Learning & Conference Center on the campus of the Georgia Institute of Technology on November 8-10, 2005. This event, sponsored by the Georgia Institute of Technology and the American Institute of Aeronautics and Astronautics (AIAA) Space Systems and Space Transportation Technical Committees, attracted more than 100 participants. The three-day conference brought together space systems engineering practitioners from military and civilian laboratories, industry, and academia with a focus on space systems engineering methodology, applications, and education. Conference registrants attended from the following organizations: the United States Air Force, National Reconnaissance Office, NASA Langley, NASA Marshall Space Flight Center, NASA Goddard Space Flight Center, NASA Kennedy Space Center, NASA Johnson Space Center, the Jet Propulsion Laboratory, the Applied Physics Laboratory, the Aerospace Corporation, Ball Aerospace, Boeing, General Dynamics, Jacobs Sverdup, Pratt & Whitney, SAIC, SpaceWorks Engineering, United Space Alliance, Embry Riddle University, Georgia Tech, Massachusetts Institute of Technology, North Carolina State University, and the University of Maryland.

Conference display

Conference activities included two short courses, a tour of Georgia Tech activities focused on space-systems research and education, a plenary session populated with government leaders, six technical sessions, and a social event. The campus tour included visits to the Space Systems Design Laboratory and the Dynamics and Control Systems



Georgia Tech AE undergraduate student Chester Ong presents paper

Laboratory (both within the Guggenheim School of Aerospace Engineering), as well as visits to the Planetary Atmospheres Laboratory within the School of Electrical and Computer Engineering and the Compact Range and High-Bay Laboratories at the Georgia Tech Research Institute. The plenary talks and technical sessions focused on the development of space-system engineering methods, space-systems education, and spacecraft intended for earth orbit, planetary exploration, and space transportation applications.

Student involvement was significant, showcasing the work of both undergraduate and graduate students, as well as encouraging new students to explore the space systems field. Aerospace engineering students working under the guidance of Professors Robert Braun, Narayanan Komerath, John Olds, Panagiotis Tsiotras, Mitchell Walker, and Alan Wilhite participated in the conference, providing a wide range of papers and oral presentations. The most outstanding student paper award was given to Alexandros Salazar-Kardozo, an AE graduate student working under the direction of Professor Tsiotras, for his paper "An Auctioning Algorithm for Optimal Satellite Refueling."

Recent AE Faculty Awards and Recognition

Professor Dewey Hodges was named a Fellow of the American Academy of Mechanics.

Professor Narayanan Komerath was named a Hesburgh Teaching Fellow and a Fellow of the NASA Institute of Advanced Concepts.

Professor J.V.R Prasad received the Best Paper Award as a co-author of a paper presented at the Uninhabited VTOL Aircraft/Rotorcraft Session at the 59th AHS Annual Forum.

Professor Mitchell Walker was selected as a Faculty Fellow for 2005 NASA Summer Faculty Research Opportunities (NSFRO).

Professor Pui-Kuen Yeung received the Hesberg Fellow Teaching Award.

Professor Ben Zinn received the 2006 George Westinghouse Gold Medal Award.

Recent AE Student Awards and Recognition

Elizabeth Deems received the Tau Beta Pi Sr. Engineering Cup.

Tommy Ender and **Sam Wanis** were named Pre-Doctoral Fellows in the Sam Nunn Security Program of Georgia Tech's School of International Affairs.

Kevin Flaherty was selected as Mr. Georgia Tech during the 2005 Homecoming celebration.

Nathan Graybeal received a Graduate Student Research Program Fellowship from the NASA Marshall Space Flight Center.

Jarret Lafleur was named an Astronaut Scholar by the Astronaut Scholarship Foundation.

Leslie Lamberson, **Leihong Li**, **Liu Liu**, and **Yoko Watanabe** received 2005-06 Zonta International Amelia Earhart Fellowships.

Runfu Li received the Luther Long Award in Engineering Mechanics.

Brandon Luders, **Patrick O'Leary**, and **Stephen Medley Jr.** received Henry Ford II Scholar Awards.

CoE Honors AE Alumni at Awards Ceremonies

Four AE alumni were recently honored at the College of Engineering's Alumni/Alumnae Awards Ceremony for 2005. At the November 4 ceremony, three AE alumni were inducted into the Engineering Hall of Fame and one AE alumnus was inducted into the Academy of Distinguished Engineering Alumni.

Induction into the Engineering Hall of Fame, the highest honor bestowed on alumni/alumnae of the College of Engineering, recognizes sustained and meritorious contributions to engineering and engineering management. AE alumni inducted into the Hall of Fame for 2005 were:

Dr. James O. Ellis Jr. MSAE '70
President and CEO
Institute of Nuclear Power Operations
Marietta, GA

Former commanding officer of an F/A-18 strike/fighter squadron Dr. James O. Ellis Jr. assumed command of the nuclear-power aircraft carrier U.S.S. Abraham Lincoln in 1991, later serving as a carrier battle group commander. He has also served as the commander in chief of the U.S. Naval Forces, Europe, and as the commander in chief of the Allied Forces, Southern Europe. He retired in September 2004 as a highly decorated veteran of the United States Navy in the rank of admiral and as commander of the United States Strategic Command, where he was responsible for the global command of U.S. strategic and space forces. In 2005, Ellis became president and CEO of the nonprofit Institute of Nuclear Power Operations.

Dr. Donald W. Richardson, AE '51
Vice President (Retired)
Science Applications International Corporation
West Palm Beach, FL

Dr. Donald W. Richardson was manager of the Advanced Projects Laboratory of Hughes Aircraft. In 1970, he founded Champlain Technology and was later named vice president of the Science Applications International Corporation, where he coordinated the company's civil aviation activities. He serves on the Federal Aviation Administration (FAA) Research, Engineering, and Development Advisory Committee. Awarded NASA's Public Service Medal in 2002, he was elected president of the American Institute of Aeronautics and Astronautics (AIAA) for 2004-2005. He is a fellow of both AIAA and the Royal Aeronautical Society. Currently chairman of Tech's Aerospace Engineering School Advisory Council, he is a member of the Georgia Tech College of Engineering Advisory Board and in 1999 was inducted into Tech's Academy of Distinguished Engineering Alumni.

Captain John W. Young, AE '52
Associate Director-Technical (Retired)
Johnson Space Center
Taylor Lake Village, TX

Captain John W. Young began his career with the United States Navy, setting two world time-to-climb records to 3,000 meter and 25,000 meter altitudes. In 1962, he was selected as a NASA astronaut. Young piloted the first Gemini spacecraft mission, flew to the moon twice, worked on the lunar surface as the commander of Apollo 16, and was the commander of the first flight of the space shuttle. He is the first person to launch from Earth six times and once from the moon. In 1996, he was named associate director at Johnson Space Center, where he was responsible for the technical, operational, and safety aspects of all agency programs. In 1976, Young retired as a captain after twenty-five years of service to the Navy, and in 2004, he retired as a highly decorated astronaut after forty-three years of service to NASA. A Congressional Space Medal of Honor recipient, he is also the recipient of more than eighty major awards, including six honorary doctorate degrees.

The Academy of Distinguished Engineering Alumni recognizes alumni/alumnae who have made significant contributions to their profession, the Institute, or the society-at-large. Individuals receiving this award are widely respected, recognized for their professional and personal success, and actively involved in engineering or management. They bring distinction to Georgia Tech. The AE alumnus inducted into the Academy for 2005 was:

Mr. Michael J. Chesser, AE '71
Chairman and CEO
Great Plains Energy
Kansas City, KS

Michael J. Chesser began his career as an engineer at the Baltimore Gas and Electric Company, where he was named vice president of marketing and gas operations in 1987. Between 1994 and 2003, he was president of Atlantic Energy, and CEO of Itron, GPU, and United Water. Since 2003, Chesser has served as the chairman and CEO of Great Plains Energy, which operates two primary businesses: a regulated utility, Kansas City Power & Light, and an unregulated competitive supplier of electricity, Strategic Energy. A trustee of the University of Missouri-Kansas City and the Midwest Research Institute, Chesser is a board member of the Heart of America United Way, Partnership for Children, the Edison Electric Institute, and the Electric Power Research Institute. He also serves on the Early Learning Leadership Board of the Mid-America Regional Council and is a member of the Kansas Business Education Partnership and the Civic Council of Greater Kansas City, which he represents on the Economic Development Corporation and several key committees.

Dr. Eric Feron *continued from page 4*

editor of IEEE's *Transactions on Automatic Control* and the *International Journal of Robust and Nonlinear Control*. He is the chairman of the IEEE Technical Committee on Robust Control and is the North America advisor for the Academie Nationale des Technologies, which is the French equivalent of the U.S. National Academy of Engineering. Among other honors, he is the recipient of a Certificate of Recognition from NASA, a Research Initiation Award from the NSF, and an ONR Young Investigator Award. More than thirty M.S. students and ten Ph.D. students have graduated under Feron's supervision.

Feron is an FAA licensed pilot. His interests include real-time software system analysis; unmanned, autonomous air vehicles; sensor design; and air traffic control. His interests are founded on fundamental aerospace engineering areas of investigation such as control theory, optimization theory, and dynamic

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Dr. Eric Feron *continued from page 6*

programming. Feron shares his passion for aerospace systems with younger people through engagements at high schools and Scout troops.

Feron's addition to the faculty of the School of Aerospace Engineering at Georgia Tech will facilitate the School's growth in the area of embedded control software engineering, which helps advance crucial technologies for the next generation of space and aerial vehicles.

Alumni News *continued from first page*

Jeffrey Osterlund, '98, was awarded the NASA Space Flight Awareness Astronauts' Personal Achievement Award in August 2005. The award, known as the Silver Snoopy, is awarded to individuals for outstanding efforts that contribute to the success of human space flight missions. Astronaut Barbara Morgan presented the award as it is the astronauts' own award for outstanding performance, contributing to flight safety and mission success. The coveted award, which is a silver pin, flew aboard the space shuttle on the STS-111 mission, and is in the form of Snoopy wearing a space helmet and space suit. Along with the pin, Osterlund received a certificate and a letter of commendation signed by Morgan citing the astronauts' appreciation of his outstanding performance. This award is annually presented to fewer than 1 percent of the space program workforce. Osterlund and his wife, Sherri, live in League City, Texas, with their two children, Natalie and Carson.

2000s

Eric Demirjian, '02, and his wife, Kathleen Mullins Demirjian, MGT '01, of Madison, Alabama, announce the birth of their first child, Patrick Lawrence, on July 15, 2005.

Jennifer Yu, '04, and Brent Hardy, of St. Louis, were married June 11, 2005, at St. Luke's Presbyterian Church in Atlanta. Yu is a systems engineer in the Future Combat Systems program at Boeing.

Kevin Chase Diggs, '05, of Crestview, Florida, has accepted a position with the Air Force at Eglin Air Force Base. As part of the position, Diggs has returned to Georgia Tech to earn his master's degree.

Deaths:

1940-1949

George L. Gluyas, '49, of Murrieta, California, on August 21, 2005. As a boy, he designed, built, and flew model aircraft and during World War II served as a cadet in the Army Air Corps' Pilot Training program. A member of Delta Sigma Phi fraternity at Georgia Tech, Gluyas was an engineer for Northrup Grumman and held patents on, or had a prominent role in the success of, such aircraft as the T-38, F-5, F-18, and the stealth bomber.

1970-1979

Curtis I. McNeal Jr., '72, of Madison, Alabama, on July 9, 2005. A longtime NASA employee, his most recent role was as senior technical assistant in the Solid and Hybrid Propulsion Systems branch of Marshall Space Flight Center. A memorial fund was established for his wife and sons, aged six and four.

What Goes around Comes around! School of Aerospace Engineering Supports DARPA Heliplane and Piasecki Autogyro UAV Programs

Dr. Daniel P. Schrage
Professor,
School of Aerospace Engineering

From as early as the 1930s, the School of Aerospace Engineering at Georgia Tech experimented with and researched autorotation flight. Autorotation flight involves a rotor that is unpowered and has an upward flow of air through the rotor. The rotor's effect is much like the rotation of a maple seed that falls from a tree. Autogyro is the name usually given to an aircraft of this type. The School obtained a Pitcairn PCA-2 autogyro in 1934 and flew it for sixty hours to study autorotation flight and how it could be improved.

In October 2005, the School received a contract from Piasecki Aircraft to help develop autonomous control for a much more modern autogyro in the role of an unmanned aerial vehicle (UAV), designated the "Air Guard." Piasecki teamed with Lockheed Martin to develop this as a Class III UAV candidate for the U.S. Army and Boeing's LSI Future Combat Systems Program. Successful autonomous control work accomplished by the School under the Defense Advanced Research Projects Agency's (DARPA) Software Enabled Control for Intelligent UAVs Program is being transferred to this program.

Because a pure autogyro cannot hover, there has been considerable interest in the means that drives the rotor in flight regimes. Research on autorotation-type vehicles by the School as early as the late 1930s and early 1940s led to the development and testing of a reaction driven rotor, commonly referred to as a "tip jet." In one such scheme, exhaust or bypass air from a turbine engine was ducted out through the rotor blade to a nozzle at its tip. A small-scale version of a tip jet rotor's wooden rotor blade is displayed in the Ferst Drive entrance lobby of the School of Aerospace Engineering.

DARPA recently awarded a contract to develop a Heliplane Gyrodyne Demonstrator Aircraft (HGDA) to a team from Groen Brothers Aviation, Adam Aircraft, Williams International, and Georgia Tech. There will also be participants from the Army AeroFlight Dynamics Directorate and NASA. The four-phase program includes a full-scale wind tunnel test in the NASA National Full-scale Aerodynamic Center in the second phase and a flight test demonstration during the fourth phase. If program milestones are successfully achieved, the total funding will be approximately $40 million.

HGDA Team goals are to combine the HGDA's vertical takeoff and landing capability with a maximum speed of 400 mph (347 knots) at 20,000-30,000-foot altitudes. The aircraft is termed a heliplane because it combines features of a helicopter and an airplane. In fact, the Adam Aircraft A-700 light commercial airplane is being converted to a heliplane by the incorporation of a Groen Brothers Aviation gyrodyne rotor. Twin Williams International FJ 44-3 turbofan engines will power the tip jet rotor, allowing the aircraft to hover and also providing thrust for forward flight. Following hover and transition, the gyrodyne rotor will be essentially in autorotation for forward flight, with the rotor slowed to reduce rotor profile drag, primarily on the advancing blade.

Photo credits: U.S. Air Force

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