College Recognizes Henne for His Achievements

Honeywell Establishes AE Endowment in His Honor; His Teams Win Three Collier Trophies

Preston Henne, '69, an alumnus of Aerospace Engineering, was honored with the College of Engineering's award for distinguished service this year, specifically for his leadership in the field of advanced aerodynamics and his excellence in program management. He was recognized, together with other alumni, faculty, and students, at the college's annual Honor Awards Convocation in April 2005. Henne is Senior Vice President for Programs, Engineering and Test, and Vice President at General Dynamics.

He began his aerospace career in 1969 at McDonnell Douglas' Long Beach Douglas Aircraft Facility, where he managed several advanced programs in aerodynamics and acoustics for both military and commercial aircraft. In 1974, he earned a master's in engineering from California State University at Long Beach. While employed at McDonnell Douglas, Henne was responsible for the aerodynamic design of the wing on the C-17, considered the most versatile aircraft in airlift history. He and his team won the 1994 Collier Trophy (which is given annually to recognize the most outstanding achievement in aerospace and is the highest award in the industry). He was responsible for the development of the divergent trailing-edge airfoil concept. In 1991, he became vice president and general manager of the MD-90 Program and oversaw the aircraft's complete development and certification process.

Joining Gulfstream in 1994, Henne was responsible for the design, development, testing, and certification of the Gulfstream V aircraft—the world's first ultra-long range business jet aircraft. The team was subsequently recognized with the Collier Trophy in 1997. He became Vice President of General Dynamics in 1999 when the company acquired Gulfstream. In his current position, he is responsible for Gulfstream's program management, engineering, and flight operations. His organization was responsible for the development of the Gulfstream G550—an achievement that was again recognized with the Collier Trophy, in 2003.

In 1981, Henne received the Department of Aeronautical and Astronautical Engineering's Outstanding Recent Alumnus Award. Eight years later, he received the Department's Distinguished Alumnus Award, and he currently serves on the College of Engineering Innovation Leadership Advisory Board at Illinois.

In recognition of his many career achievements, Henne was elected as a Fellow in the American Institute of Aeronautics and Astronautics in 2001; this year, he was elected to the National Academy of Engineering. In 2003, Honeywell (a partner with Gulfstream in the development of the G550) established the *Preston A. Henne Endowment in Aerospace Engineering* at the University of Illinois at Urbana-Champaign, "in recognition of the PlaneView vision for the Gulfstream G550 of Preston A. Henne, which has set new standards for integrated avionics systems and cockpits for future generation aircraft."

—Rick Kubetz, Office of Engineering Communications, College of Engineering

Stillwell Seminar, *continued from page 1*

aerospace industry has undergone "a set of dramatic transformations that have affected every facet of our profession and our industrial base." Widnall said the quest for speed has reached a plateau; now the profession must focus on delivering value to a wide variety of stakeholders and to compete for societal resources with other business and technology sectors.

The needs of aerospace customers are changing too: the commercial and military missions are more complex, with an airspace that must integrate information. Widnall said the essence of aerospace engineering today is successful systems integration of technologies across a wide range of disciplines, in a highly competitive and global business climate. "I believe that what is required is nothing less than a redefinition of the profession of aerospace engineering. This has dramatic implications for university curricula, and for the way the aerospace industry uses its engineering."

Two distinguished AE alumni also gave presentations during the anniversary celebration: **Robert Liebeck** ('61, MS '62, PhD '68), a Boeing Senior Technical Fellow, spoke about the future of subsonic transportation with reference to the blended-wing-body concept (BWB), which he co-developed. The BWB is a revolutionary design for subsonic transports that is widely considered as the next revolution in subsonic commercial transportation. Liebeck's presentation touched on various aspects of the BWB—its genesis, architecture, aerodynamic and structural efficiency, and its "green" aspects. He also outlined some challenges for future aeronautical engineers: fuel efficiency, alternate fuel sources (hydrogen), and environmental concerns (chemical pollution from hydrogen fuel, contrails at higher altitudes, and noise).

"Aerospace curriculum... must capture and reshape students' passion..."

—Sheila Widnall

George Muellner ('67), the vice president and general manager of Air Force Systems at Boeing, spoke on the future of military aerospace. Muellner talked about technological advances in military systems (combat, weapon, and missile systems, as well as systems in airborne intelligence, surveillance, and reconnaissance), and how the various components of the battlespace should be integrated (terrestrial, airborne, and space, together with communication networks). He detailed some emerging areas of interest and technology needs (integrated battlespace, hypersonic and supersonic weapons) and the competencies required to fulfill future needs. He concluded his presentation with a quote from the Italian general Giulio Douhet, who wrote *The Command of the Air*: "Victory smiles upon those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after the changes occur."

John Mankins spoke about the future of space exploration and the role innovation and technology will play. He is manager of Exploration Systems Research and Technology at NASA Headquarters in Washington D.C. He talked about the grand challenges the agency will need to surmount to achieve the program's national goals and policies. A robust space exploration program will need to innovate and use technology that is affordable, reliable, safe, effective, and flexible, he said.

Over 100 participants, many of them alumni, gathered in Urbana in April 2005 to celebrate the department's anniversary. Faculty members, students, and staff put out the welcome mat, bringing visitors up-to-date on AE's research program: highlighting research advances, pointing out facility improvements, and showcasing student accomplishments.

—Alison Fong Weingartner

George Muellner.

Robert Liebeck.

Latina Engineer Makes An Impact of Her Own

Editor's note: Maldonado was contacted for this story before July 4, 2005, when the impactor spacecraft hit Tempel 1 at 23,000 miles per hour.

Carolina Maldonado ('01) worked with NASA's Mars Exploration Rover (MER) team to help *Spirit* land on Mars in early 2004. For the past year, she's been working towards close encounters of a comet kind and making an impact on that project too—NASA's *Deep Impact* mission at the Jet Propulsion Lab in California. The *Deep Impact* scientists want to punch a hole into comet Tempel 1 to find clues about the structure and composition of comets and how the solar system formed.

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—Carolina Maldonado

Before the *Deep Impact* mission, Maldonado was working with the Mars Exploration team to put two rovers on Mars. She wrote test procedures on how to electrically integrate some of the different pieces of the rover electronics. "Before the actual flight rovers were built, we had several testbeds that contained hardware replicas of the electronics boards and other mechanisms such as the pancam mast assembly that sits on top of the rover. I started by writing test procedures on how to electrically integrate some of the different pieces of the rover electronics while using our latest software to test the particular item being integrated. Once the integrations were done, we moved on to functional testing of the system where we wrote and executed tests on subsystem interactions and higher level functions of the system.

Carolina Maldonado with a replica of a rover for the Mars Exploration Rover project. The picture was taken at a location on JPL grounds, "where we set up an environment to test the rover's mobility and navigation."

"I am currently working on the *Deep Impact* project as a test engineer," Maldonado said. "You caught me at a very busy and very exciting time. On July 4 of this year, the *Deep Impact* spacecraft will release an impactor that will excavate a crater on Tempel 1. I mostly test the sequences for the Encounter activity, which covers the last 24 hours of the mission.

"In those 24 hours, we have two major events that are happening: the separation event, which is where the flyby and impactor physically separate, and final imaging, the last two hours of imaging during the mission. The test itself used to last 30 hours because we needed setup time; lately it has grown to 40 hours to accommodate updates to our sequences and to be able to test more of the overall picture."

About 24 hours before impact, the flyby spacecraft will release the impactor into the comet's path. The impactor will use its automatic navigation software to steer itself to the Sun-facing side of Tempel 1's heart. Just before crashing, it will take the closest images ever of a comet's surface. The collision between impactor and comet will gouge a hole that can be as small as the size of a sport utility vehicle or as large as the size of a football stadium. According to the Jet Propulsion Lab's *Deep Impact* Web site, the kinetic energy that will be released by the collision is estimated to be equal to nearly five tons of TNT. However, the comet's velocity and orbital path will not be appreciably modified.

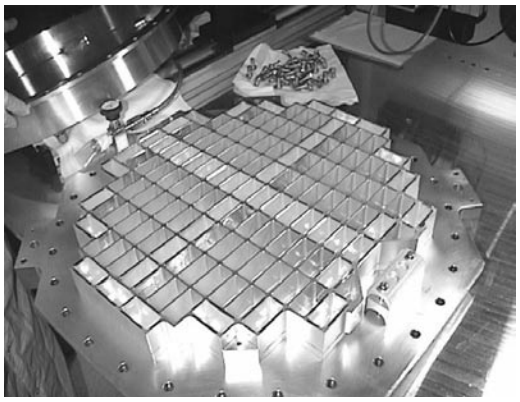
Support Office to train and mentor project managers. For its accomplishments, the *Stardust* team from JPL and Lockheed Martin received an Aerospace Laurel Award in 2005. The award is presented annually by *Aviation Week & Space Technology* to honor extraordinary individual and team accomplishments in the aviation, aerospace, and defense industries.

Stardust really began in 1994, when NASA sought proposals for the fourth in its Discovery series of low-cost, highly focused projects. The *Stardust* spacecraft was launched five years later. It flew a seven-year, round-trip mission of 2.8 billion miles to rendezvous with comet Wild 2, collecting dust grains near the comet's nucleus that may have originated when the solar system began some 4.5 billion years ago. A "twofer" was collecting bits of interstellar dust streaming into the solar system from other parts of the galaxy (which is how the mission came to be named). Those samples are quite "young" by comparison, perhaps only 10 million years old.

Now that the spacecraft has returned to Earth, its starry and cometary contents, embedded in a light-as-air substance called aerogel, will be transferred to the Johnson Space Center in Houston, where it will be opened.

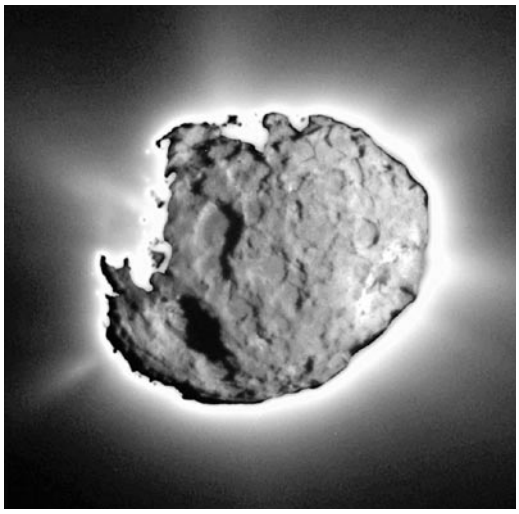
Here is part of Atkins' account of *Stardust*'s return:

"There were a lot of emotions going on Saturday evening (January 14) as the landing approached. After living with *Stardust* since 1995 when it was just an idea, there was the realization that the final flight chapter was really about to begin. I was confident that what had happened to *Genesis* (no chute) would not happen because the g-switches were correctly installed on *Stardust* (*Genesis* was a NASA mission to orbit the Sun, collecting solar wind particles). …Still, there are always the 'unknowns' you just can't anticipate. No vehicle had ever entered the atmosphere as fast as the *Stardust* sample return capsule. It had a new high-technology heat shield. The chute system had never been operationally used, since the one on *Genesis* didn't deploy. The weather seemed 'iffy' for January 15. …But at four hours out, the capsule was released from the spacecraft, and I felt elation that we'd committed and were coming in. As the events ticked off successfully...weather clearing so the helicopters could fly (amazing!), entry at 400,000 ft and 29,000 mph, pick-up by the radars, excellent predicts on the touchdown point and time..., we reached the 'moment of truth' where the small drogue chute was to deploy at Mach 1.4 and 105,000 ft. This was to stabilize the capsule through the transonic zone and prevent tumbling. Bingo! Exactly on time, the small white blip on the IR tracking jumped off the screen upward...! The tracking camera re-acquired the white blip of the capsule and it glowed 'steady'... no blinking that would indicate tumbling. …Then we waited for the 10,000 ft mark for main chute to deploy as the drogue was jettisoned. …It was euphoria as the call came confirming we were on the main chute, and we could see the ghostly black-and-white image of the canopy reflectors and the sample return capsule swinging below on the risers! It was floating down almost exactly as depicted in the pre-launch animation film I'd seen seemingly a thousand times in presentations I'd given. …Touchdown was at 9 mph and 2 minutes early...only 4 miles northeast of the target landing point. Imagine ... 29,000 mph to 9 mph in about 7 minutes and then 6 minutes more floating to touchdown. My feelings? Indescribable joy, …gratitude, ...awe, …and giddiness. …The cheers, the smiles, the moist eyes, the struggle to accept that we really had made it flooded over all of us and washed away the fact that it was in the wee hours and no one had really slept for a long time. …As each hour passes now (and I've been to Houston and assured myself through a microscope that particles are really trapped in the



Pictures by NASA

Stardust's aerogel tray.



A composite picture of comet Wild 2, which is about three miles in diameter. The images were taken during the spacecraft's flyby in January 2004.

aerogel) and the afterglow continues,...the moments of the project, and the realization that we've succeeded, flood back to bring that curl of a smile I can't control. So when I come back for the next (alumni) board meeting, you'll understand if you see me sitting there smiling when not a thing 'funny' has been said."

Mike Zolensky (left), Stardust *curator and co-investigator, and Donald Brownlee, principal investigator with the University of Washington, study* Stardust *material after its canister is opened in a laboratory at JSC.*

Atkins has served since the 1970s on the AE Advisory Board and has known all the department heads from "Shel" Stillwell to Mike Bragg. He received AE's Distinguished Alumnus Award in 1999.

For more about *Stardust:* ***www.nasa.gov/stardust***

This 'n That of Interest

- ***Engineering/Aerospace Engineering Rankings 2005...***The University of Illinois at Urbana-Champaign's College of Engineering was ranked 4th overall in the 2005 *U.S. News & World Report* survey. Aerospace Engineering's program climbed to 8th in the rankings. Last year, AE shared 9th place with two other universities.
- ***Record-setting freshman class...***The class of 2009 at the Urbana-Champaign campus is made up of a record-setting 7,650 freshmen, according to the UI News Bureau.
- ***University President inaugurated...***B. Joseph White was installed as the 16th president of the University of Illinois in September, in a ceremony of pomp and music at the Krannert Center for the Performing Arts. White told students, faculty, and alumni who had turned out to hear his inaugural address, that to create "a brilliant future," four things are needed: high-aspiration plans, resources, leadership, and big ideas. "Understand: I did not come here to preside over decline."
- ***Patents distinction...***Illinois placed 9th among the top ten colleges and universities that received the most patents in 2004. The information was given in the July/August/September 2005 issue of *Inventors' Digest* magazine. The University of California received the most patents (424); the University of Illinois received 58.
- ***World's top universities are American...***Seventeen of the world's top 20 universities are American, according to the widely used global ranking by the Shanghai Jiao Tong University. The survey was cited in a recent issue of Britain's *Economist* magazine. The survey showed that the most significant development in higher education was the emergence of a super-league of global universities.
- ***Students affected by Hurricane Katrina...***Hurricane Katrina left thousands of college students in New Orleans without schools and homes. The University of Illinois campuses in Urbana-Champaign and Chicago admitted more than 100 students, including two foreign students who had Fulbright scholarships to attend Tulane. The university was also exploring ways to connect students to its Guided Individual Study courses and to accommodate displaced faculty and graduate students. The storm disrupted the start of school for an estimated 75,000 to 100,000 students enrolled at more than 30 colleges in the New Orleans area, according to the Washington-based American Council on Education.