Volume Seven
Issue One

The Longhorn Liftoff

Spring 2007

Murciélago Takes Flight!

Chairman's Corner

Robert H. Bishop
ASE/EM Chairman & Professor
Photo by Caroling Lee

Believe it or not, we are already at the half way point between our last ABET accreditation visit and our next one. Yep, time flies. Since our last accreditation visit, we have been architecting an integrated plan to provide students with the opportunity to participate in real-world design experiences, we are working to update our curriculum, and we are strengthening the academics by raising our expectations of both students and faculty. How does this activity relate to our aerospace engineering program objectives?

The first and second objective (see inset below) can be tackled in traditional lecture-based engineering courses. Much of the teaching innovation emphasis today is directed towards delivering lectures via electronic means, in virtual classrooms, and in using other technology-based methods to improve the effectiveness of lecture-based education. In some cases, to a lesser degree, the technology is being employed to deliver laboratory-based education to locations where it otherwise would not exist.

The greatest challenges to us are presented by the third and fourth objectives. These are the soft engineering objectives. Can we instill a commitment to ethical behavior relying solely on classroom lecture? Probably not. Can we provide students with an awareness of their work in a contemporary global and societal context within the confines of the classroom? Again, probably not.

In theory, the design of aerospace systems is a structured process. Over the past three years, we have come to recognize from experience that designing and building student satellites and small unmanned aircraft is a messy business. The classic classroom lecture alone cannot imbue students with the practical skills necessary to design and build aerospace systems. We have found it essential to the learning process to provide a complementary hands-on experience. To that end, we are marching down the path of discovery-learning to facilitate abstract reasoning, to enhance retention of concepts, and to improve student outlook about their chosen profession.

A design paradigm shift has occurred. Performance issues are often overshadowed by manufacturing and cost issues. Pragmatic matters dominate the discussions. To prepare students for productive careers in engineering, our curriculum must address the issue of integrating the theory with relevant design issues, such as mathematical modeling, implementation, complexity, and cost. We choose to use discovery-learning (that is, student projects) as a key player in the education process. We are addressing life-long education and ethical behavior while providing students with an awareness of the effects of technology.

Educational Program Objectives

1. To prepare students for professional practice in aerospace engineering and related engineering and scientific fields.

2. To prepare students for post-baccalaureate education as their aptitude and professional goals may dictate.

3. To instill in students a commitment to life-long education and ethical behavior throughout their professional careers.

4. To provide students with an awareness of the effects of technology in a contemporary global and societal context.

Why would students voluntarily take on additional responsibilities of extra-curricular activities? The reasons are as varied and complex as the students themselves, but surely the main reason is that the projects are compelling. Indeed, our student projects are not contrived. We are designing and building small satellites. We will undoubtedly fly them into space. We will operate and control the spacecraft from the university building where the students take classes and spend their days. We have designed and built two unmanned aerial vehicles, and are now preparing to fly autonomously for the first time. For faculty and students these are awesome opportunities.

Faculty Awards and Recognition

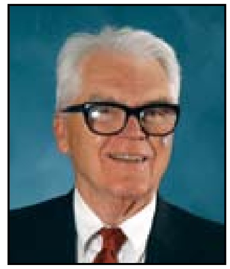
Robert H. Bishop, ASE/EM Chairman and Professor, has been elected Fellow of AIAA (American Institute of Aeronautics and Astronautics). In the words of the Institute "The distinction of 'Fellow' is bestowed by AIAA and its Board of Directors to members who have made notable and valuable contributions to the arts, sciences, or technology thereof in aeronautics or astronautics." The award will be presented at the 2007 Aerospace Spotlight Awards Gala on Tuesday, May 15, 2007 in Washington, DC.

Dr. Bishop specializes in guidance, navigation and control of aerospace vehicles. He has served on the College of Engineering faculty since 1990. He has 10 years of industrial experience and has published numerous journal articles and three books. He was the recipient of the 1997 Lockheed Martin Tactical Aircraft Systems Excellence in Engineering Teaching Award, the 1999 John Leland Atwood Award, and was elected to The UT Academy of Distinguished Teachers in 2002. Dr. Bishop currently serves as Chairman of the Department of Aerospace Engineering and Engineering Mechanics.

Wallace Fowler, ASE/EM Professor, has been selected to receive the 2007 UT-Austin Women in Engineering Advocate Award. This award recognizes an outstanding faculty member who is viewed by students as an advocate for advancing women in the field of engineering. Dr. Fowler was presented with the award at an industry banquet this past February.

One of Dr. Fowler's nominators wrote: "Dr. Fowler was an amazing mentor, he opened up countless doors by providing us funding, lab testing equipment, material resources, and of course smart ideas! Dr. Fowler deserves this award because he is a huge supporter of women engineers... [and] he loves and respects his students and does whatever he can to help them succeed."

Dr. Fowler's research focuses on the area of design and design methodology, the modeling and design of spacecraft, aircraft, and planetary exploration systems. He has served on the College of Engineering faculty since 1965. He has three years of industrial experience, has published more than 50 technical articles and reports, and has co-authored two books. He is the recipient of 1997 Academy of Distinguished Teachers Ex-Students Association Award and in 1999 he was awarded the Engineering Foundation Advisory Council Award. Dr. Fowler also serves as Director of the Texas Space Grant Consortium (TSGC).



Hans Mark , ASE/EM Professor, will be honored for his contributions to the U.S. military space program at the annual meeting of the American Astronautical Society. Dr. Mark received the 2006 Military Astronautics Award on November 14 at the society's meeting in Pasadena, California.

Dr. Mark specializes in the study of spacecraft and aircraft design, electromagnetic rail guns, and national defense policy. He has served on the faculty of the College of Engineering since 1988. He served as chancellor of The University of Texas System from 1984 to 1992. He previously taught at Boston University, Massachusetts Institute of Technology, University of California at Berkeley, and Stanford University. Dr. Mark has served as director of the NASA-Ames Research Center, Secretary of the Air Force, deputy administrator of NASA and most recently, the Director of Defense Research and Engineering. He has published more than 180 technical reports and authored or edited eight books. Dr. Mark is a member of the National Academy of Engineering and an Honorary Fellow of the American Institute of Aeronautics and Astronautics. He is the recipient of the 1999 Joe J. King Engineering Achievement Award and the 1999 George E. Haddaway Medal for Achievement in Aviation.

Stelios Kyriakides, ASE/EM Professor, has been elected into the National Academy of Engineering (NAE). Election to the NAE is among the highest professional distinctions bestowed to an engineer. Dr. Kyriakides was elected for his "contributions to understanding of propagating instability phenomena in structures and materials and its use for technological applications."

Professor Kyriakides' major technical interests are in the mechanics of solids with an emphasis on instability at both the macro (structural) and micro (material) levels. His work is motivated by practical problems and usually involves combined experimental, analytical and numerical efforts. He has pioneered the area of propagating instabilities in solids, structures and materials. Such instabilities have been shown to govern the mechanical behavior of structures of larger size such as offshore pipelines, oil well casings and tunnel linings, long panels in pressure loaded structures, etc.

Dr. Kyriakides joined the University of Texas in 1980. He has received numerous awards, including the National Science Foundation Presidential Investigator Award in 1984. He is a fellow of both the American Society of Mechanical Engineers and the American Academy of Mechanics. He has published more than 100 technical articles and reports. Dr. Kyriakides is the Director of Center for Research in Mechanics of Solids, Structures and Materials.

ASE and NASA Team Up to Develop Systems Engineering Curriculum

Lisa Guerra, UT Research Fellow, sponsored by NASA

Three years ago this month President Bush announced a sweeping vision for space exploration. After decades of space shuttle missions close to Earth, NASA was charged to send astronauts back to the moon and eventually to Mars and beyond. Since that Presidential directive was issued, NASA and specifically the Exploration Systems Mission Directorate (ESMD) have focused on building a new generation of crewed spacecraft. The new space vehicle and its launch system, dubbed *Constellation*, are scheduled to carry astronauts back to the moon in 13 years. Prior to lunar missions, the vehicles will achieve operational capability via trips to the International Space Station by 2014.

This artist's rendering represents a concept of the Earth Departure Stage engines firing to take an Orion crew vehicle and a lunar lander out of Earth orbit and further into space.

In order to fulfill the scope of this exploration vision, NASA will need to design, build and operate numerous systems—from lunar landers to robotic rovers to space suits. So what does this new focus for human spaceflight mean for the future NASA workforce? If you ask this question of the current NASA Administrator, or the ESMD Associate Administrator, or the Constellation Program Manager, you will most likely receive the same answer—systems engineers.

Recognizing this future need for systems engineers in the aerospace community, the ASE/EM department at the University of Texas at Austin, in partnership with NASA, is sponsoring investigation of the development of a systems engineering curriculum. Initially, the curriculum might include an undergraduate course, Systems Engineering for Aerospace Engineers, intended as a prerequisite to the senior-level spacecraft and aircraft design courses. For NASA, this course will be viewed as a pilot project with the potential of being exported to other interested universities in the national Space Grant Consortium. At the undergraduate level, the goal is to teach the fundamentals of systems engineering such that future practicing engineers are familiar with the concepts and processes to be exercised further in the work environment. For the University of Texas at Austin, there is additional potential for establishing a Master's degree program in systems engineering. Such a program would be intended for professional engineers from a variety of engineering disciplines and backgrounds.

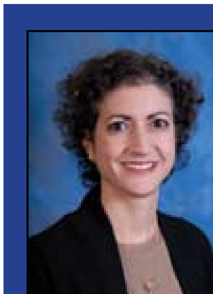
So, just what is systems engineering? According to The International Council of Systems Engineering (INCOSE): "Systems Engineering (SE) is a design and management discipline that is very useful in the designing and building of large or complex systems. It is a discipline that was conceived of and introduced by the U.S. Government and was developed to counteract the difficulties encountered in the engineering of increasingly large, complex, and inter-disciplinary technological systems."

Systems engineering has as its basis a few simple but powerful principles. The *first principle* is iterative top-down (or hierarchical) design. This simply means that a complex system is designed by breaking a system down into its component subsystems and then repeating the process on each subsystem until off-the-shelf or uniquely designable components remain.

A *second principle* is bottom-up integration. This principle simply means that large systems are built by taking the lowest level components and putting them together one level at a time. Between each level's integration, the result of the previous level is tested and verified to make sure it works. In this way, even very large systems can be easily built and bugs can be discovered and fixed before they are buried too deeply.

A *third principle* is the importance of the system life cycle. A life cycle is simply an understanding of the progression of a system from inception, to design, to construction, implementation, operation, maintenance, and eventually to its disposal. This principle aids in the understanding of what needs to be done when and where, and in breaking large conceptual procedures or processes into smaller, more manageable pieces.

The *last principle* is that of "stakeholder perspective." Systems engineering attempts to build systems that take into account the stakeholder's needs, goals and objectives. Applying this principle enables credible requirements and effective designs that are responsive to many views, from the astronaut/operator to Presidential administrations.



Lisa Guerra has 20 years experience in the NASA aerospace community. Currently, Ms. Guerra is on an assignment from NASA Headquarters to establish a systems engineering curriculum at UT-Austin. She has worked in various engineering and management positions at the Johnson Space Center, the Goddard Space Flight Center and NASA Headquarters. Ms. Guerra earned a B.S in Aerospace Engineering and a B.A. in English from the University of Notre Dame. She received a Master of Science degree in Aerospace Engineering from the University of Texas at Austin.

Lockheed Martin Air Systems Design Laboratory Takes Off

Lockheed Martin representatives present a check for $100,000, a portion of which will go toward the construction of the new Lockheed Martin Air Systems Design Lab.
From left to right: Dr. Bishop, ASE/EM Chairman, Admiral John Butler, Lockheed Martin, Dean Ben Streetman, College of Engineering, and Dan Crowley, Lockheed Martin.

Thanks to the efforts of Dr. Bishop and a grant from The Lockheed Martin Corporation, UT students will have the opportunity to work on UAV projects in a new state of the art air systems design lab. This wasn't always the case—the old lab, originally located in WRW 208, was cramped with little room for more than one project at a time. The absence of analysis tools, composite work equipment, and the presence of clutter accumulated from past years' projects further reduced the utility of the lab.

After an improved performance at the Design, Build, Fly (DBF) competition and the development of the Unmanned Aerial Vehicle (UAV) group, the need for a bigger, more advanced aircraft construction facility became evident. At the end of the Spring 2006 semester, WRW 202 was completely evacuated. New equipment and tools were purchased and the entire DBF setup was moved from WRW 208 to WRW 202. During the remainder of the summer, ASE faculty and the Chairman, Dr. Robert Bishop, with the assistance of a Senior Design Group, iterated on the final layout and design for the room.

In the meantime, UT contacts at Lockheed Martin worked on acquiring funding. On September 29, 2006 the UT Lockheed Martin Air Systems Design Laboratory (ASDL) was officially inaugurated. That day, Lockheed Martin Representatives donated $100,000 to the Department of Aerospace Engineering and Engineering Mechanics, providing the necessary funds to jump-start the project. After finalizing plans and schedules, construction on the ASDL officially began January of this year. Construction is expected to continue for the next couple of months and should be completed by the end of the Spring 2007 semester.

The new lab will boast a storage room, workshop, conference room, avionics lab, and a student lounge. All materials too bulky to keep in the workshop (reams of fiberglass, carbon fiber, etc.) will be kept in storage next door for convenience. The workshop will be used for all construction work and will be equipped with tools ranging from cutting and measuring instruments to aircraft covering tools and an assortment of glues. Students will gather in the conference room to discuss design options and communicate verbally or via drawings on the white board. The conference room will also include a projector for presenting ideas. In addition, the new lab will contain five new desktop and three laptop computers, a 50 inch plasma screen, an oscilloscope, digital multimeter, soldering tools, and a plotter.

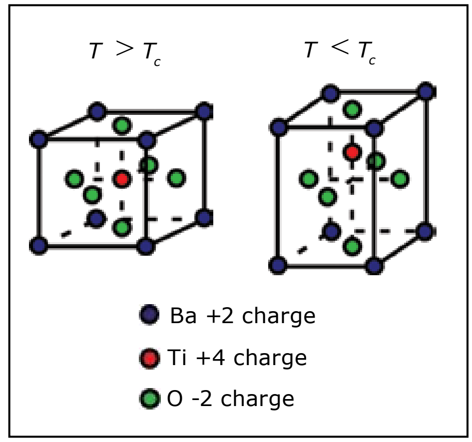
ASE undergraduate students discuss their aircraft with Dan Crowley of Lockheed Martin.

The Lockheed Martin Air Systems Design Lab and its student-led projects are open to students of all majors and disciplines. Students from Aerospace Engineering, Computer Sciences, Mechanical Engineering, and Electrical and Computer Engineering are currently involved with the development of the new lab and its projects.

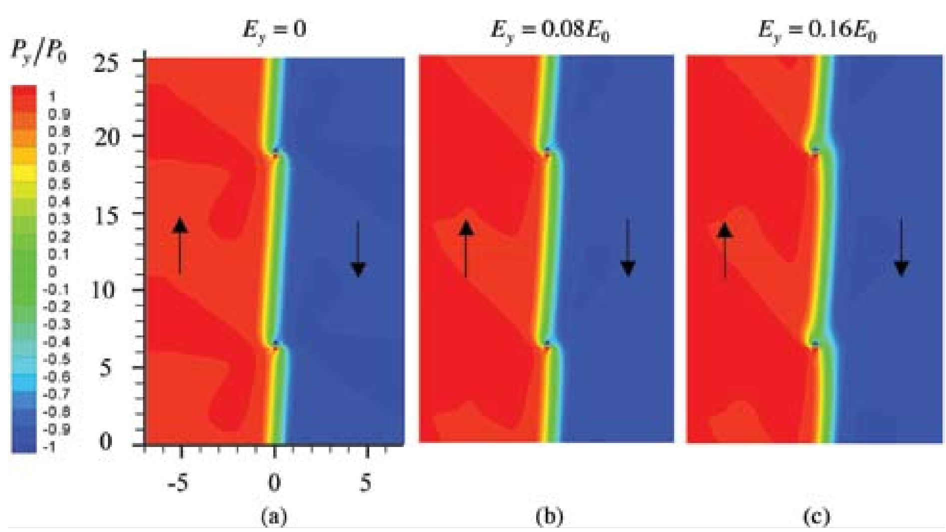
Chad Landis Joins ASE/EM as Assistant Professor

Chad Landis was born in rural Lancaster, Pennsylvania and grew up there until age ten when his family moved to the suburbs of Chicago. Chad returned to Pennsylvania for his undergraduate education where he studied mechanical engineering and business at the University of Pennsylvania. After earning his BS degrees, Chad moved on to California to earn his MS and PhD degrees in mechanical engineering at the University of California at Santa Barbara. In April of 1999 he packed up his car and drove across the country to Cambridge, Massachusetts where he spent a little over a year as a post-doctoral fellow at Harvard University. Chad finally got his first real job in 2000, so he packed up his car again, now with his pet parrot Ike (short for Isaac Newton), and drove from Boston to Houston, Texas where he joined the faculty of Rice University in the department of Mechanical Engineering and Materials Science. Professor Landis spent the next six and a half years at Rice developing his teaching and research, but more importantly, meeting his wife Jennifer whom he married in 2004. Chad and Jennifer then had their son Aidan in 2005. Chad joined the UT Department of Aerospace Engineering and Engineering Mechanics in January 2007.

Professor Landis' research and teaching interests are in the mechanics of materials and modeling and simulation of material behavior. His prior work includes modeling the strength of fiber composites, fracture mechanics of rate dependent materials, and constitutive and fracture modeling of piezoelectric and ferroelectric materials. Professor Landis' current work focuses on the modeling and simulation of microstructural evolution and material defect interactions in smart materials. The term "smart material" is used to characterize a wide class of solid materials with the common feature that they exhibit an exceptionally strong coupling between two or more physical phenomena including mechanical, thermal, optical, electrical and magnetic behaviors. Such materials usually undergo a phase transition at one or more temperatures (in magnetic and ferroelectric materials this is called the Curie temperature) where the atomic arrangement changes from a high symmetry phase, usually cubic, to a lower symmetry phase, for example tetragonal. Such a phase change is shown (at right) for a ferroelectric barium titanate material. Barium titanate is an ionic ceramic material with a perovskite crystal structure. Below the Curie temperature T_c the central (red) titanium ion displaces towards one of the cube faces and elongates the structure. The specific ionic nature of this substance makes it particularly sensitive to electric field, such that the application of electric field to the material causes shape change and applied pressures to the material cause polarization changes. This strong electromechanical coupling makes these materials very useful for sensors (Naval sonar systems) and actuators (the fuel injectors in your new BMW).



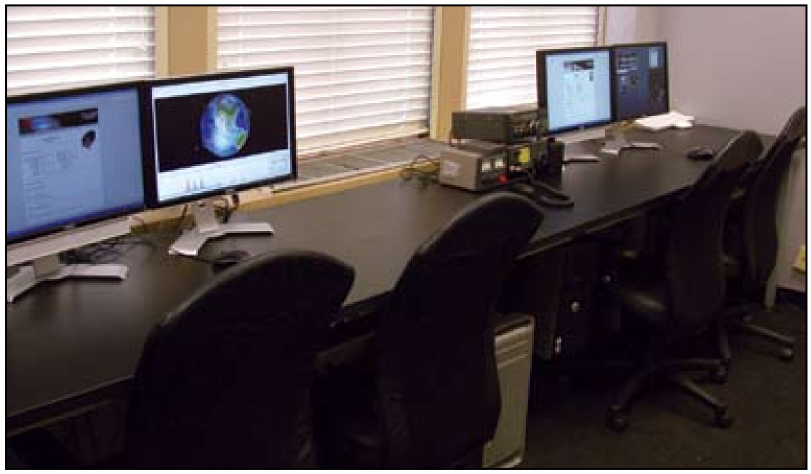
What makes these materials even more interesting is their ability to "switch" between different variants of the same structure in the low temperature phase. For example, the (red) titanium ion (and thus the material polarization) of the unit cell is drawn in one (upward) of the possible six different states, and the application of a sufficiently strong downward directed electric field can drive the polarization to the downward state. In a real material this switching behavior occurs through the motion of interfaces called domain walls which separate two distinct variants/domains. Dr. Landis' research is focused on the quantitative modeling of the interaction of these domain walls with other material defects. Illustrated below is a schematic of the pinning of a domain wall by an array of charged defects. To the left of the wall the material has an upward polarization and to the right the polarization is downward. The electric field is applied in the upward direction such that the domain wall "wants" to move to the right. The charge defect arrays acts to pin the wall such that a finite electric field is required before the wall "breaks through" the array. Simulations like these help to explain several features of ferroelectric behavior including the electrical coercive field strength. Dr. Landis plans to continue his work on ferroelectric materials and apply these modeling techniques to another class of smart materials call ferromagnetic shape memory alloys.



Spacecraft Control Center Upgraded for Mission Control

Thomas Campbell, Research Associate

The UT Spacecraft Control Center located in WRW is in the middle of a complete overhaul in order to provide a premier facility for commanding and controlling student satellite missions, beginning with the expected launch of FASTRAC next year.



Pictured here: Dual satellite control consoles

The Spacecraft Control Center was first established in the fall of 2003 to give students hands-on experience communicating with low-earth orbiting satellites. The modest station consisted of a 3-meter dish, and two high gain Yagi antennas. This gave students the capability to listen to satellites transmitting on S-band (2.4GHz), and to actively communicate with satellites on both VHF and UHF frequencies.

The radios and control equipment were located in the back room of the Satellite Design Lab in an equipment rack. This setup was useful during construction of the FASTRAC satellites because it simplified development and testing of the satellite's communications systems.

Now that the FASTRAC satellites are finished and are preparing for launch, the Spacecraft Control Center is gearing up to be the primary control station for the mission, as well as becoming a flagship satellite communication station designed to support other university satellite missions.

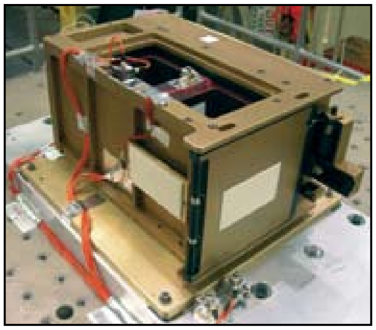
Radios and antenna controllers are used at each control station.

The Spacecraft Control Center equipment has been moved down the hall to a new control room in WRW 403A, which has been remodeled from the carpet upward, thanks in part to a grant from Lockheed Martin. The design of the new Spacecraft Control Center was completed by a senior design team and two student volunteers. This group of five students consisted of Andrew Cave, Jim Coutre, Manuel Gonzalez, Kate Gushwa, and Adam Reeder.

Two control consoles were installed to provide for simultaneous communications with two spacecraft. This is necessary to support the three multi-satellite missions—FASTRAC, ARTEMIS, and PARADIGM—currently under construction by students. Each control console is staffed by two student satellite controllers. One controller is responsible for running the antennas and radios, while the other controller sends commands to the satellite and collects down-linked telemetry.

Situational awareness will be provided on a 50-inch plasma screen and two smaller screens co-located on the far wall of the control room. This system will provide the student satellite controllers with all the information necessary to determine the location and health of the satellites currently being tracked.

University Satellite to Lauch on Space Shuttle



The satelites will be put into orbit using the Space Shuttle Picosat Launcher (SSPL). Image courtesy of Department of Defense Space Test Program

The Aerospace Engineering and Engineering Mechanics department at the University of Texas now has another addition to its space-bound family. PARADIGM, an acronym for "Platform for Autonomous Rendezvous and Docking with Innovative GN&C Methods," is a student-built satellite program that came into concept in September 2005. The program is a joint effort between the University of Texas and Texas A&M University sponsored by Johnson Space Center (JSC) in Houston, TX.

JSC has asked each team to build a picosatellite that, as a starting platform, is capable of autonomous rendezvous and docking demonstrations. The program architecture centers around four satellite missions, each of which will build upon the technology demonstrated in the previous mission. If the program remains on track, Mission 1 for the two satellites is scheduled to launch onboard the STS-127 mission in January 2009.

Each picosatellite must fit in a 5" cube spaceframe and have a mass of no more than 3.5 kilograms. The satellites are independently designed but will be launched from the shuttle in a joined configuration and will be capable of communicating with one another. The main deliverable for the mission is data from the JSC developed Dragon GPS receiver. Information from these receivers may be used in the future to perform desired navigation and rendezvous maneuvers.

This spring, four teams are working on PARADIGM subsystem designs in the ASE 463Q Senior Design course. Students interested in helping PARADIGM fly onboard the Shuttle are also welcome to join the team. For more information about the project, please contact Jessica Williams (jessica-williams@mail.utexas.edu).

ARTEMIS Satellite Competing For Launch Opportunity

Students at the University of Texas at Austin have joined hundreds of others across the nation in the Air Force Research Laboratory's University Nanosatellite-4 Program, a competition held every two years to build a satellite that is technically important and flyable—all on a sponsored budget of about $100,000, a very low cost for space hardware. The Nanosatellite Program aims to educate the future workforce of America as well as give students the chance to see something that they built launched into space, should they be selected as the winner. The program gives students the opportunity to work on a technically challenging project with real hardware, deadlines, and responsibility—all valuable and worthwhile experiences.

Team members of ARTEMIS pose with a UT nanosatellite.

UT's current satellite project is known as ARTEMIS (Autonomous Rendezvous and rapid Turnaround Experiment Maneuverable Inspection Satellite), which is actually UT's second entry in the competition. The first, FASTRAC, won the previous competition, and the finished satellite is now at the Air Force Research Laboratory in Albuquerque, NM awaiting final testing and a launch assignment. One of the primary objectives of FASTRAC is the ability to measure the relative position and velocity between two small vehicles which separate in orbit for low cost—using GPS receivers, additional sensors, and an active crosslink. ARTEMIS is considered the logical follow on to FASTRAC, because it adds powered movement, hopefully bringing the satellites back together again after separation. Once the two satellites have drifted a few kilometers from each other, the chaser satellite is equipped with propulsion and guidance systems that will attempt to return the vehicle within 10 meters of the other.

Students recently presented a critical piece of the ARTEMIS mission design, the GNC system, at the national American Astronautical Society's Guidance and Control conference. The ARTEMIS team is now gearing up for the next competition review in late March, when their design will be evaluated by a panel of judges.

Murciélago Takes Flight

One of the main advantages of a small unmanned aerial vehicle (UAV) is that it can be used as an ideal platform for flight dynamics and controls research due to its relatively easy operation and low cost. The Lockheed Martin Air Systems Design Laboratory (ASDL) at the University of Texas at Austin has completed a UAV that will be used as an autonomous airborne Light Detection and Ranging (LIDAR) research platform which will form

Members of the UT UAV Team make adjustments to the aircraft before flight.

images with great accuracy and detail. The UT UAV has been given the call sign Murciélago, meaning "bat" in Spanish. The goals for Murciélago are to design a small aircraft to fly autonomously, while maximizing endurance (minimize drag) using electric power, a pusher propeller (easier access to the nose), and composite materials (light weight).

Murciélago has undergone initial flight analysis. Advance Aircraft Analysis (AAA) software has been used to determine the static and dynamic stability values. MATLAB is currently being incorporated to create a simulation to verify the AAA software and to gain a higher understanding of the predicted aircraft performance.

Murciélago's first flight was on October 7, 2006. The flight was a success with only minor improvements needed. Murciélago flew approximately 45 minutes and was very stable. Since the first flight, Murciélago has successfully flown three additional times. Inlets have been added to the nose of the airplane to provide for more cooling to the engine, flight computer, and the LIDAR system. The ground station—which includes a laptop, high gain Omni directional antenna, and user-interface software—has also successfully been used to receive real-time data from Murciélago in flight.

The LIDAR payload will enable the UAV the ability to map the terrain. This will supply the flight computer with accurate information for flight planning and will provide useful scientific information. The UAV will be able to precisely determine its distance from the ground, which is crucial in both take-off and landing scenarios.

The navigation and controls systems are composed of onboard Crossbow Stargate X-Scale processor platforms which employ embedded Linux as the operating system. Currently, navigation is performed by open source software that runs on Stargate. The sensor package includes one GPS unit, three accelerometers, three gyros, one magnetometer, one static and one dynamic pressure sensor, and two temperature sensors, serial communications, and a servo drive system. A wireless Ethernet 802.11g card is used for communication from the UAV to the ground station.

Although many tasks still need to be accomplished, the team has an ambitious goal to fly its first autonomous flight by mid-March. Watch for future updates on Murciélago.

Murciélago ready for take-off

Blast From the Past!

1950s

Stewart L. Davis, BS ASE 1958, writes, "I retired in 2000 following 42 years in the Air Force and aerospace industry (25 years with NASA). After reflecting back on those rewarding years, I decided to write about it. The resulting book, *Three Journeys*, has just been published. The book is classified as historical fiction, but based on real people and events of the sixties. Look for it —there is an image of the Texas tower on the cover! Publisher is PublishAmerica, Pen-name is David Stuart, 415 pages."

vkdavis@aol.com

1980s

Dana Gunter, BS ASE 1983, is retired from the United States Air Force.
airdmoney@aol.com

S. Alan Stern, MS ASE 1980, has been selected by NASA to serve as the agency's Associate Administrator for the Science Mission Directorate, effective April 2. According to NASA, "Stern will direct a wide variety of research and scientific exploration programs for Earth studies, space weather, the solar system, and the universe beyond. In addition, he will manage a broad spectrum of grant-base research programs and spacecraft projects to study Earth and the universe." For more details about Stern's new position, visit our alumni web page at http://www.ae.utexas.edu/alumni/index.html

1990s

James A. Westgate, BS ASE 1996, writes, "I am serving as Captain in the U.S. Army stationed at Schofield Barracks, Hawaii, with duty in Iraq as the commander of Headquarters and Headquarters Company, 3rd Brigade Special Troops Battalion. I previously served in Afghanistan as the Chief of Facilities for the Combined Forced Command-Afghanistan."
czwestgate@hotmail.com

Erol Cagatay, BS ASE 1998, writes, "After having received a Master's Degree in Aerospace Engineering from Georgia Tech in 2001, I decided to backpack around the world, which I did for eight months. Having done that, I decided to get a job, and I have been employed at TAI here in Ankara, Turkey for over three years now. I am currently responsible for the system installation in the fuselage components my company is building for the A400M, a military cargo fighter."
ecagatay@gmail.com

2000s

Gabe Garrett, BS ASE 2004, writes, "For almost a year now I have been employed in Houston as an engineer for Applied Science and Engineering Research (ARES) Corporation, an engineering consulting firm. I have had the opportunity to work on a wide variety of aerospace projects for both government and the commercial industry. Currently I am supporting tasks for Space Shuttle Orbiter, ISS CEV (Orion), and CLV (Ares I and V). Earlier this year I got to work onsite at Space Exploration Technologies Incorporated (SpaceX) in El Segundo, CA in support of their COTS proposal to NASA which they were just recently awarded. I also supported a task related to the Department of Homeland Security's Secure Border Initiative (SBI). Hook 'Em Horns!"
gabe.garrett@gmail.com

Joshua D. Haben, BS ASE 2006, is a Research Assistant for Dr. Bennighof in the Center for Aeromechanics Research at UT Austin. He plans to begin graduate study here at UT in structural dynamics beginning in Fall 2007.
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Allison Krisak, BS ASE 2006, works for Teledyne Brown Engineering in Houston, TX.
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Barbara Lucke, BS ASE 2006, is a Dancewear Specialist for Movin' Easy Dancewear in Austin, TX.

blucke@mail.utexas.edu

Joshua Mahan, BS ASE 2000, works as a Space Shuttle PASS FSW Ascent Verification Coordinator for United Space Alliance in Houston, TX.
jmahan77@houston.rr.com

Jeremiah D. McClellan, BS ASE 2006, is a Design Engineer for Epic Aircraft in Bend, OR.
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Crystal Ramirez, BS ASE 2006, works as an Engineer Staff I for United Space Alliance in Houston, TX.

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Tyson Roll, BS ASE 2006, is a Field Engineer for Schlumberger in TX.
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The UT experience...talk about an awesome ride.

When I first started in Aerospace I had an idea it would be tough, but I didn't know what hit me when I also found out how rewarding it would be. Yeah, I studied a lot... In fact, one of the best ways for me to describe it was that I "dated my books." Nonetheless, I learned more than just how to design an aircraft. Distinguished professors like Dr. Varghese, Dr. Maughmer and Dr. Buckley encouraged us to *think* and solve the *right* problems rather than blindly following the same old path.

Outside of class these professors and many others were also great friends. I remember getting to talk with Dr. Buckley and Dr. Maughmer for hours on end about our unmanned aerial vehicle (UAV) group and how we were going to make it better. I'll never forget how they went so far out of their way to help us grow and the fact that even though I was in the midst of giants, I never felt small.

I also didn't expect to help build a successful UAV group and make so many friends in the process. With the help of many other students and backing from Dr. Bishop & the Aerospace Department, Jorge Alvarez and I started the group in the Fall of 2005. Helping build this group from just a few of our buddies who felt sorry for us to several dozen committed students was an awesome experience... And we managed to design a UAV that solved a real world problem, built it, and now the group has been successfully flying. For an aerospace guy, it doesn't get much better than that... Hook 'em.

Chris Reddick was selected to receive the College of Engineering Outstanding Leadership Award this past Fall, 2006.

Where Are They Now?

Tommy Power, Ph.D. Engineering Mechanics, 1995

I took a position in Houston with Stress Engineering Services, Inc.—an employee-owned company—in July, 1995, just after finishing my Ph.D. I have been happily employed there since then, working in our Floating Systems practice. My primary focus has been on the analysis and design of the marine riser systems that connect offshore floating deepwater production facilities (Google: "Mars TLP" or "Na Kika") to wells and/or pipelines on the seafloor. We are currently working in maximum water depths of well over one mile, and are attempting to stay on top of an exploding workload as oil prices in the $50+/barrel range have touched off a flurry of activity in the offshore exploration and production arenas.

The basic problem for a marine riser is how to connect a floating structure subject to hurricane winds and waves to a fixture on the seafloor—either directly beneath the floater or up to several miles away—using pipes ranging from 4" up to 24" in diameter. The design and analysis of marine risers is therefore a multi-disciplinary undertaking, combining solid mechanics, random structural dynamics, random rigid body dynamics, mechanical engineering, corrosion, and fluid-structure interaction issues.

My practice provides consulting services to oil companies seeking either designs or analysis of others' designs as well as oversight of fabrication and construction operations. Our work consists of global system dynamic analysis in both the time and frequency domains, finite element component analysis, component and system design, and lots of document writing and reviewing.

In the first work-related photo (above, left), I am shown standing next to mile-long stalks of insulated 8.625" outside diameter × 1.000" wall thickness steel pipeline that will be installed on the Gulf of Mexico seafloor in March 2007 on one of my current projects. These stalks will be welded to one another as they are reeled onto large spools on a pipelay ship (Google: "Deep Blue Pipelay") and then unreeled offshore during the lay operation. The last 6,000 feet or so of each of two such pipelines are my primary concern, as these will be catenary risers. These risers will assume a catenary geometry under their own weight, touching down on the seafloor approximately 2200 horizontal feet from their hang-off location on the host platform in 4270 feet of seawater.

In the second work-related photo (above, right), I am shown holding open a polyethylene device called a strake. Strakes (among other devices) are installed on risers in order to suppress vortex-induced vibration (VIV), caused by vortex shedding in the presence of ocean currents. VIV, if not suppressed, poses a serious fatigue threat to riser systems.

The non-work-related photo (left) shows me with a new acquisition, a 2000 BMW R1100RT motorcycle, purchased in October of 2006. God willing, I will be traveling to Big Bend and the Davis Mountains on this bike in early March 2007 with work colleagues.

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"The Longhorn Liftoff" is published bi-annually for alumni and friends of the Department of Aerospace Engineering & Engineering Mechanics at the University of Texas at Austin.

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Keep in Touch!

We enjoy receiving your alumni news, and need more from you to keep the "Blast From the Past" column up to date. If you are interested in keeping in touch, please complete the on-line update form on our Alumni webpage at:
http://www.ae.utexas.edu/alumni
Thank you for your interest in the department. We look forward to hearing from you soon!

ASE Student Receives National Cooperative Education Award

Corwin Olson, UT senior Aerospace Engineering major, has received the Cooperative Education Student Achievement Award from the Cooperative Education and Internship Association (CEIA). CEIA is a national organization dedicated to professional development in the field of cooperative education. This award is given to one student each year who is nominated by professionals in the cooperative education field.

Corwin began his first co-op term with the United Space Alliance (USA) at NASA's Johnson Space Center in the spring of 2005. Corwin set himself apart from other students in the Co-op Program with his strong leadership abilities. He became a certified NASA instructor for several classes and completed the Motion Control System (MCS) specialist mastery. He further distinguished himself by teaching more classes than anyone else in his group and being rated as one of the top four instructors in his division by the 2004 class of astronauts. He also earned the title of MCS Global Positioning System (GPS) Subject Matter Expert. In this role he developed a new class called GPS 101 for NASA's Training Division. These accomplishments and his work with his fellow co-ops earned Corwin the Silver Gyro award. In presenting this award USA recognized him as "go[ing] above and beyond expectations."

The CEIA's Cooperative Education Student Award recognizes not only his work off campus, but also his contribution to the University of Texas at Austin. Corwin is an Aerospace Engineering student who not only maintains an excellent GPA but is actively involved in research, community service, and numerous campus organizations. He is an active member of Kappa Theta Epsilon (KTE), the co-op honor society. Through his work in that organization and the UT student chapter of the American Institute of Aeronautics and Astronautics (AIAA), Corwin has helped promote the engineering cooperative education program around campus.

Corwin plans to complete his undergraduate coursework at UT this semester, and graduate with a Bachelor of Science degree in Aerospace Engineering in May of 2007.