FALL 2012

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MECHANICAL & AEROSPACE ENGINEERING

MAE alumnus and former Gators football player works at Norfolk Southern

Dan Plonk has flown planes, worked on train dispatch systems and done civil engineering surveying. But before all of that, he wore a Florida Gators football jersey.

Plonk played offensive lineman for four years while he worked on his mechanical engineering degree. After football games, he'd go to Steak 'N Shake with his family on 13th Street. Strangers on the street waved hello. His friends watched him do interviews on TV.

After fall practice, Plonk used to study until 11:30 p.m. to help balance out football and academics.

"It wasn't as difficult as it would seem," he said. "Having a lot of my time eaten up with football forced me to use my remaining free time wisely."

He didn't know it then, but some aspects of his football experience would help his professional pursuits. With football, you have to deal with adjusting your priorities, managing your time and even dealing with physical pain.

"It makes regular work and some elements of your life seem like peanuts," he said, "which is what it ought to be, really."

Plonk loved playing football, but he also valued his classes. In fact, he pays credit to **Knox T. Millsaps** for changing the way he approached engineering.

"Even though he didn't know it, he had a profound influence on me," Plonk said. "He turned me into one heck of a problem solver."

Plonk has always loved analysis and improving processes, and these interests guided his career path.

After graduating from UF in 1983 (B.S.), he got his master's from Georgia Tech, an MBA from Virginia Tech, and went on to work at the Georgia Tech Research Institute. During his time at GTRI, he did work for the Strategic Defense Initiative.

"I enjoyed it. I had the latitude to apply a lot of the stuff I learned as a student," he said. "I got to be one heck of a programmer, as well."

Later, after leaving GTRI, he instructed a physics class part time at a local college, got all of his pilot licenses and started civil

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INSIDE

UF UNIVERSITY of FLORIDA

Letter from the
CHAIR

David W. Hahn

Dear Colleagues, Alumni and Friends,

I welcome everyone to the Fall 2012 issue of the MAE newsletter, and I'm excited to be passing on these stories about the ongoing activities of our alumni, students and faculty members. As the Gator football team is heading to the Sugar Bowl, I hope you will enjoy reading about MAE alumnus Dan Plonk's success as a student athlete. I also understand that we have a current member of the Gator team in Mechanical Engineering! As you will read in this issue, the department continues to excel in a number of areas, and I never fail to be impressed by the accomplishments of our faculty and students. Our feature on the ties between MAE and Sandia National Laboratories is a nice example of the success of our students following graduation and the growing reputation of our program with top-notch employers.

With this issue, I want to focus attention on our undergraduate students and their participation in activities outside of the classroom. Whenever I meet with prospective students and their families, I always mention the wonderful opportunities for student involvement in our professional societies. There is, perhaps, no better way to be an integral part of MAE than participation with our student groups, such as the American Society of Mechanical Engineers (ASME), the American Institute of Aeronautics and Astronautics (AIAA), the Society of Automotive Engineers (SAE), the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), the ME honor society Pi Tau Sigma, the Society of Women Engineers (SWE), the National Society of Black Engineers (NSBE), and the Society of Hispanic Professional Engineers (SHPE), to name a few. I am also pleased to announce that our students have reactivated our Aerospace honor society chapter of Sigma Gamma Tau.

The back cover has a photograph of MAE SWE members at the SWE National Conference held last month in Houston. The SWE conference provides networking and professional development opportunities through workshops, panel discussions, career fairs and collegiate competitions and is an excellent example of our student conferences. The back cover also shows graphics of MAE student participation in a few representative groups based on our Spring 2012 Exit Survey of graduating seniors. I am pleased to see such high participation in ASME and AIAA, with the results closely mirroring our breakdown of ME and AE graduates.

Our student groups also play key roles in promoting teamwork, implementation of classroom theory and leadership through their many design-and-build teams, such as the SAE Formula One, the Rocket Team and the AIAA Design/Build/Fly competitions. I consistently hear from our employers the value of team and leadership skills gained from such ventures, including multidisciplinary aspects. The final graphic on the back cover shows our students' self-assessment of their abilities to function on multidisciplinary teams, and I am pleased to report that this is one of their highest-rated categories of success. College of Engineering Dean Cammy Abernathy has identified leadership as a key attribute for our Gator Engineers, and I am very proud to see our MAE students doing so well. I meet regularly with our student society leaders, and I never fail to come away from my meetings impressed by our students. One of my goals as department chair is to provide the maximum degree of support to our student groups, and I'm happy to say that our alumni giving is strong and growing, allowing MAE to do even more for our extracurricular activities.

Overall, MAE students are thriving in and out of the classroom, and I can think of no better ambassadors for MAE than our Gator Engineering graduates!

MAE professor seeks socioeconomic applications for small sats

Think of a satellite. Now think of who it may belong to. Some probable guesses are NASA and the Department of Defense. But Prof. **Norman Fitz-Coy** and the Advanced Space Technologies Research & Engineering Center are trying to add an alternative ownership option — a privatized option.

Much of Fitz-Coy's research revolves around small satellites, especially ones under 50 kg, and striving to discover useful, socioeconomic applications for them.

"We're trying to look at whether there's a market for satellite data that is non-governmental driven," he said.

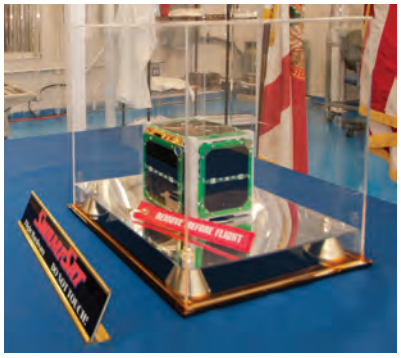
The rationale for working with smaller satellites is that reducing size can lead to lower costs. Fitz-Coy said the government can't afford the traditional, big multi-billion dollar satellites anymore.

If less expensive satellites were available, government and private institutions would have the ability to replace satellites more often and also more easily complement the satellites they already have.

"The timing is coming together," Fitz-Coy said. "The technology is there to make it happen, and there's also the financial crunch to justify going this route."

With this opportunity, he said the focus is on finding practical functionalities that have socioeconomic benefits. So far, small satellites help people learn how to build satellites. They also have space weather applications.

But the University of Florida wants to look beyond these two known utilities, Fitz-Coy said, and explore what can be done that would be of interest to both NASA and to developing countries.



SwampSat unveiling

It's hard to know for sure just how advantageous private, small satellites could be. Fitz-Coy likened their creation to the beginning of the Internet — at first, people didn't understand its potential. Small satellites can have the same lifecycle.

"It's really the ability to provide options that people haven't thought about," he said. "As long as you can give them the data, smart enough people will be able to come up with applications for it."

Fitz-Coy is concerned with the humanitarian application, which is why he's involved with international collaborations. He's in the process of creating an understanding with a university in South Africa and a university in Ghana.

"These countries have quite a bit of interest in using satellite technology to improve life for their populace," he said. "They all want to use it for human capacity development — developing an educated workforce."

While working on these worldwide partnerships, Fitz-Coy also collaborates with others at UF. He works with MAE professors **Warren Dixon** and **John Conklin**, along with faculty members from Electrical and Computer Engineering,

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In Memoriam: Robert Gaither

Our department remembers **Robert B. Gaither**, former professor and chairman of the Department of Mechanical Engineering, who passed away on Aug. 18.

His life was full of admirable accomplishments, from being the 100th president of American Society of Mechanical Engineers to serving in the Navy for four years.

We've lost someone whose contributions to the University of Florida will always be valued and remembered. Bob taught plasma physics and rocket engine design, and he made sure to place emphasis on courses that offered new applications to keep the curriculum relevant and useful.

He also helped start the mechanical engineering Ph.D. program during his 27 years as chairman. It went on to become one of the most highly enrolled graduate programs in the college. Bob succeeded in advancing the department's development and inspiring those around him.

William Tiederman, the department chair who succeeded Bob, remembers his sense of humor and the way he filled out the newspaper crossword puzzle every day.

"I can unequivocally say that Bob was nothing but totally supportive of me when I succeeded him as chair," Tiederman said.

In addition to his hard work at the University of Florida, Bob is also remembered for his sense of humor and his sense of integrity. He was both a colleague and a friend who we surely miss. ▲

Professor helps cancer diagnostic efforts through K25 Award

Hugh Fan

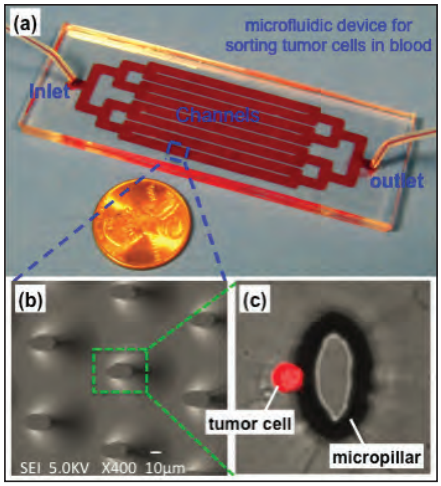
About 1,639,000 new cases of cancer were expected to be diagnosed this year, according to a 2012 American Cancer Society report. Professor **Hugh Fan** is doing his part to make these diagnoses earlier and treatment easier.

In August 2011, Fan won the National Cancer Institute's Mentored Quantitative Research Career Development Award (K25), which is given to engineers with limited experience in biomedicine. The idea is that with their unique technical knowledge, along with learning the biomedical fundamentals, they'll be able to offer a new perspective in addressing medical issues the National Institutes of Health wants to solve.

With the award of more than $900,000, Fan has been working with the former director of UF Shands Cancer Center, Dr. Stratford May, to learn about cancer biology and improve cancer diagnostics.

In most cases of cancer deaths, cancer cells from one organ shed from a tumor, travel through the bloodstream, and colonize in other organs. Detecting these abnormal circulating tumor cells (CTC) in the bloodstream can help with early-stage diagnosis and effectiveness of a therapeutic treatment.

But there's a problem — in 1 mL of blood, there are more than 5 billion red and white blood cells but less than 100 CTCs, making the detection process extremely difficult. Fan's research involves creating a platform for capturing these CTCs using microfluidics, a field that miniaturizes analytical instruments.



Microfluidic devices now make it possible to sort circulating tumor cells from other cells in the blood to speed diagnoses.

A lot has already been accomplished. Fan and the other researchers have designed a microfluidic device, applied the device for sorting and concentrating leukemia cells, and demonstrated the device for detecting as low as 10 colorectal tumor cells spiked into 1 mL of blood.

Fan has enjoyed this rewarding line of work. He values getting to experience other areas of research, though getting on the same page with medical experts wasn't too easy. "The language used by engineers and the language used by medical professionals are different," he said. "You really want to understand their vocabulary."

Luckily he'd taken biology courses and knew the basics, so with time and effort, there was no longer a lack of understanding — only teamwork and discovery.

"It's exciting because every day you learn a new thing," he said. "That's what science is all about." ▲

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Agricultural and Biological Engineering, Astronomy, and Forest Resources and Conservation to develop small sat projects that can make a difference.

But he doesn't just collaborate with faculty — he teaches MAE students about his research interests, as well. Students can join the space systems design class or the small satellite design club to learn about satellite design and construction.

For example, the Small Satellite Design and Development Lab created SwampSat, a 1U CubeSat for an innovative, on-orbit demonstration of a compact control system that exhibits rapid retargeting and precision pointing. It's set to launch in July 2013.

"The students come with a different level of interest and motivation," Fitz-Coy said. "Once they get engaged, it's just exciting to see them so interested in their activity. This is something that when they put it on their resume, they pretty much have jobs because they know how to build a satellite — they built a satellite."

Members of the field seem to recognize the importance of these skills — UF alumnus **Trase Travers**, the president and CEO of Millennium, recently donated $10,000 to small sat team efforts. His company donated $10,000, as well. Support like this is appreciated and helps the department continue to give students practical skills and experience. ▲

Vice Provost Emeritus Hemp spent career making invaluable contributions to UF

Professor Emeritus and Vice Provost Emeritus **Gene Hemp** started teaching UF students in 1967 and enjoyed his classes on engineering design, vibration theory and dynamics. He went from assistant professor to associate professor, to a professor of engineering sciences almost a decade later.

When people suggested Hemp participate in the university administration, he was hesitant to agree.

"I was really enjoying my teaching and research, and both were going along very well," he said.

However, when the associate dean offered him the chance to be the college coordinator for the biomedical engineering and applied mathematics programs, he decided to give a part-time administrative position a shot.

The rest was history.

He started as the college coordinator for the biomedical engineering and applied mathematics programs, and adding this to his teaching job, he was essentially working the equivalent of two full-time jobs.

This was only the beginning of his influential career at UF, as he went on to be assistant dean of the College of Engineering; the senior associate vice president for academic affairs; vice provost for academic affairs; the interim dean of graduate studies and research; and interim provost.

During his career, Hemp made countless contributions to UF engineering, from restarting the Society of Women Engineers to helping to bring Internet connections to the departments.

Gene was also a member of the small group that helped start the Internet, not only on the University of Florida campus, but around the country.

In addition to his work at UF, he was a member of the Association of NROTC Colleges and Universities for 28 years, the interim provost and CEO of the New World School of the Arts (the state's conservatory) for a year, and the acting president and interim provost at Florida Gulf Coast University for a year.

"I've been very blessed with a lot of good opportunities, fun things to learn and ways to contribute," Hemp said.

While Hemp participated in positions at other universities and organizations, his involvement with UF remained strong. He enjoyed his role in administrative capacities.

"What you were doing was enabling people to do their jobs," he said. "If you're smart, you help foster other people being successful, not necessarily yourself."

Gene Hemp

Because of his dedication and work ethic, Hemp received about 20 honors and awards over the years, including the Navy's two highest recognitions to a civilian for service to the Navy and the Army's second highest award for service to the Army. He's exceptionally proud of being awarded the UF Presidential Medallion, which recognizes individuals who make major contributions to the university.

"I was very grateful to the university to get it," he said.

While working for UF, Hemp greatly valued integrity and following through with what he said he'd accomplish. He recalled that **David Smith**, the dean of education at the time, said, "Gene's word is golden." Those words meant a lot to him.

"You did what you thought was right and you stayed with it," Hemp said. "People value that they knew you were going to do what you believed was right based on the facts that you have."

Department chairman **David Hahn** said he's grateful to have someone with so much experience still active with the university.

"I find Gene to be an excellent mentor and colleague to turn to for advice in thinking through various issues," Hahn said.

After all of his experiences with the university, it's hard for Hemp to put into words how he feels about UF.

"It's been a home for me and my family," he said. "It's been very good to us. I'm happy I was in a position to make contributions for many years." ▲

MAE faculty and staff, December 2012

Faculty Updates

We'd like to recognize and congratulate...

John Conklin who joined the UF Mechanical and Aerospace Engineering faculty in August of 2012 after working for three years at the W. W. Hansen Experimental Physics Laboratory at Stanford University as a research associate. He received his BS and MEng degrees from Cornell University and PhD from Stanford. In 2011, John was the Fulbright Junior Lecturer at the University of Trento in Italy. He has been awarded the Zeldovich Medal (2010) by COSPAR & the Russian Academy of Sciences for contributions to fundamental physics in space, the Balhaus Prize (2009) for best PhD thesis in Aeronautics and Astronautics at Stanford, and the NASA Group Achievement Award (2005) as a member of the Gravity Probe B science team. John's research is in the development of precision instruments, spacecraft dynamics & control, and the design and analysis of space missions that depend heavily on these technologies.

Anil Rao for being tenured and promoted to Associate Professor.

Warren Dixon for being promoted to Full Professor, and being named the Charles E. Taylor Faculty Fellow.

Youping Chen for being tenured and promoted to Associate Professor.

David Hahn for being named a Senior Member of the Optical Society of America and of the International Society for Optics and Photonics this year.

Gregory Sawyer for being selected to attend the 2012 U.S. Frontiers of Engineering Symposium held at the GM Technical Center in Warren, Michigan, from Sept. 13 to Sept. 15 and NAE's 2012 U.S. Frontiers of Engineering Education Symposium held at the National Academies' Beckman Center, from Oct. 14-17, 2012.

Ghatu Subhash and his colleagues for being awarded more than $868,000 from Florida Space Research Institute grants and a Department of Energy award.

S.A. Sherif for accomplishing an impressive amount this summer where he went from working with researchers from the Federal University of Rio de Janeiro on designing a wind tunnel for aircraft icing studies straight to Canada for the 19th World Hydrogen Energy Conference.

Pat Sforza, a "retired" MAE faculty member, for his book, called "Theory of Aerospace Propulsion," being published by Elsevier. He's currently under contract for two more books, as well. He also had an article accepted for the Encyclopedia of Aerospace Engineering published by Cambridge University Press.

DuWayne Schubring for being elected as the treasurer of the Thermal Hydraulics Division of the American Nuclear Society for 2012 to 2013.

B. J. Fregly for receiving a $330k new NSF award entitled "Computational Neuromechanics for Stroke Rehabilitation" with co-PI Carolynn Patten in the Physical Therapy Department.

Peter Ifju for being named the recipient of the Knox T. Millsaps chair. In addition, Prof. Ifju recently completed his tenure as President of the Society for Experimental Mechanics by presiding over the 12th International Congress on Experimental Mechanics in June. He now joins Professor Charles Taylor and Daniel Drucker on the list of SEM past presidents from UF.

Hitomi Greenslet for being made an associate member of the CIRP, an honor that is limited to 150 associate members. These members are well known scientists with high potential and are elected typically for a period of three years with the possibility of renewal.

Henry Sodano for receiving the 2012 Young Composites Researcher Award from the American Society for Composites.

John Abbitt for receiving the Mort Wolfson Faculty Service Award, which is given each year to a UF faculty member who exemplifies the values of commitment and service to students through advising and teaching.

AIAA members bring aerospace issues to Congress

The atmosphere of Congressional Visits Day was not a dull one.

MAE graduate **Laura Rose** (B.S.A.E., 2012) approached a Congressional staffer, gave a speech that lasted mere minutes and handed over a packet of supplementary information.

Because Rose had many congressional offices to visit and not much time, she did her best to quickly discuss some of the key issues that concern the American Institute of Aeronautics and Astronautics.

Ideally she'd speak to a member of Congress, but if he or she was unavailable, she had the full attention of the staffers. Luckily, the staffers were the eyes and ears of the congressmen and congresswomen, so every word spoken could make a difference.

Congressional Visits Day (CVD) is an annual event during which AIAA participants talk to members of Congress about what can be done to best serve the aerospace community.

According to MAE alumnus **Ron Schlagheck**, the AIAA CVD advocacy volunteer and a retired NASA program manager, the experience gives members the opportunity to speak with decision-makers about aeronautics and astronautics, space and defense issues.

Making a good point in the 10-minute conversation could mean a change in policy and, in some cases, influence the legislation in the industry as a whole.

In particular, the students can express concerns about the careers they're about to pursue. For example, if there aren't many jobs in the field, they can pose the question: What's going to be done about it?

"The message comes across really strong, as they're the nation's future," Schlagheck said.

AIAA members brought a variety of policy issues to the table, from increasing funding for relevant education (including STEM) to strengthening the national commitment to aerospace research.

Laura Rose

At the time, Rose was still a UF student serving as president of the UF student branch of AIAA. But that didn't keep her from seizing the opportunity to discuss aerospace issues with political decision-makers.

Her interest in the event stemmed from her family's history of political involvement.

"Policy has been a big part of my life for a long time and so has my love of space," she said. "While in college, I realized space policy was the perfect combination of my two interests."

Congressional Visits Day reaffirmed what she already suspected — she truly enjoys taking part in the policy side of aerospace issues.

Schlagheck said simply being around members of Congress helps students see how policy influences aerospace companies and the nation in general.

> *"I think the part of policy that intrigues me the most is all the policy yet to be created." – Laura Rose.*

"This brings to them a different side of things than just the coursework in a particular subject area," he said. "To stand back and get that view is important."

In five years, Rose sees herself working as an engineer for an aerospace company while still being actively involved in AIAA and space policy.

"I think the part of policy that intrigues me the most is all the policy yet to be created," she said. "Space is an unclaimed territory."

For now, Rose is working on a graduate degree at The George Washington University. She found out she had been admitted while she was at Congressional Visits Day in Washington, D.C., so she figured it was meant to be. Now she's working hard and aiming high.

"My ultimate career goal is to be an integral part of a huge breakthrough in the aerospace industry," she said. ▲

UF Rocket Team wins award, sparks interest in aerospace

The award-winning UF Rocket Team stands with one of its projects at a nationwide competition.

When witnessing a rocket launch, you experience the booming sounds and the graceful flight. The scene is impressive, from the initial launch to when the rocket drifts back down on the parachute.

"It's a very rewarding experience," said Professor **Rick Lind**. "Until students get the chance to attend, they don't fully appreciate how much fun rocketry is."

Students curious about rocketry can join the UF Rocket Team, which has been at UF for three years and involves about 50 people. For the last two years, they participated in the NASA University Student Launch Initiative, a competition that involves creating a rocket that goes a mile high and carries a scientific payload.

At the USLI in the spring, the UF team won the Project Review Award, which is given to the team with the best preflight engineering and is based primarily on application of theoretical knowledge and design technique.

"When we first started, that was the one award we coveted the most," said Lind, the faculty adviser for the team. "This one shows that you understand why your rocket performs the way it performs, so hopefully it's also indicative of the students' demonstrated set of skills they'll need when they go out to the job market."

Aerospace senior **Paige Attaway**, the team's project manager during the last competition, said seeing the team recognized for its work on several different parts of the rocket, pulling the various reports together and finally presenting them to the judges was a great experience.

"Obviously it's a good feeling to get an award," she said. "The whole team put in a ton of effort in order to get that done."

Attaway enjoyed the opportunity to be involved in the aerospace field outside of her curriculum. She said she was able to network with industry professionals, learn how to work in a team and add this aerospace experience to her resume.

"When you're interviewing, it gives you something to talk about that's not related to being in the classroom," she said.

To gain that out-of-the-classroom experience, students had to dedicate five to 10 hours a week as the design deadline approached.

"The students were very highly motivated to put so much time into an extracurricular activity," Lind said. "It's been an enjoyable experience getting a chance to work with some of the best students we have in the department."

In addition to the design work, NASA required a nontechnical portion of the competition involving community outreach. The UF team held one-hour workshops at local elementary schools, teaching children about rockets and sometimes even launching toy-class rockets to help spark interest in aerospace.

The UF Rocket Team isn't the only way to learn about rocketry — Lind has incorporated rocket dynamics into the fall semester of his Senior Design and Aerospace lab, as well.

Because of safety and hardware concerns involved with competitions, the lab allows Lind to get more into professional design techniques used in the industry that he can't optimize with the team.

"The students get a lot of benefit just by cutting wood and tubes and putting pieces together to see how things fit," he said. "They can see the whole thing perform like it was simulated to do."

But the rocket team is still trying to optimize its designs every year now that they've demonstrated their flight safety. They're currently preparing for next year's launch, getting ready to use more complicated payloads and hit the one-mile altitude target. ▲

THE UF ROCKET TEAM WOULD LIKE TO THANK ITS SPONSORS:

- Millennium Engineering and Integration Company
- NASA
- Boeing
- Lockheed-Martin
- Northrop-Grumman
- Pratt & Whitney
- The University of Florida

UF students and alumni working at the Hawthorne, CA, SpaceX location show their school spirit with the Gator Chomp.

Student Updates

We'd like to recognize and congratulate...

Andrew Meyer, who was a finalist in the Ph.D. Student Paper Competition (along with Jennifer Jackson from BME) at the ASME Summer Bioengineering Conference in Puerto Rico. He took second place in his division.

Thomas C. Underwood, who won the 2012 National Undergraduate Fellowship to spend a summer at Princeton Plasma Physics Laboratory. This 10-week internship is available for students interested in the fusion of science and engineering.

Marlana Goldsmith, who received the 2012 Zonta International Amelia Earhart Fellowship. Her research involves ceramic matrix composites, which are used in high temperature applications in hypersonic and space vehicles. The fellowships are granted annually to women pursuing graduate Ph.D./doctoral degrees in aerospace-related sciences and aerospace-related engineering.

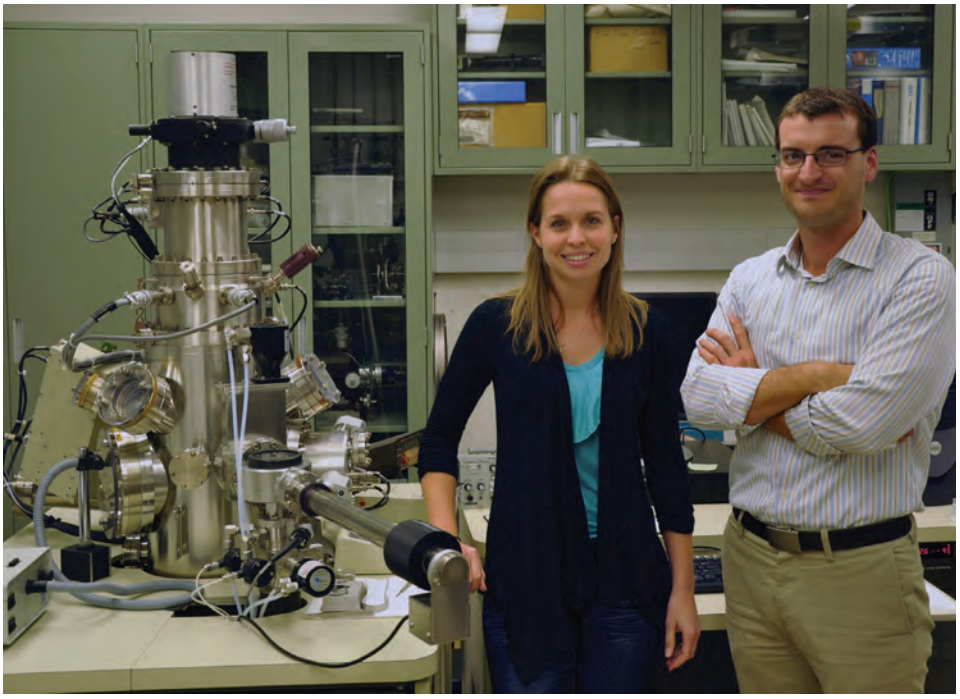
Nicholas Fisher, who was recognized by the College of Engineering and selected to represent the Ph.D. Gator Engineering Attribute of Professional Excellence in the 2012-2013 academic year.

Ryan Carter, who was awarded the Best Student Paper at the AIAA Atmospheric Flight Mechanics Conference in Minneapolis, MN. His work was titled, "Parametric Modeling for Store Separation Aerodynamics using System Identification."

Arthur A. Graziano, who received the 2012 ASME Elisabeth M. and Winchell M. Parsons Scholarship.

Our **ASME** student chapter for hosting the Intel sponsored *Stay With It* program in November that focused on engineering freshman retention. Guest speakers were engineers from Tesla Motors and the Boeing Company hypersonics program.

MAE students, alumni experience collaborative Sandia culture



Rachel Colbert along with fellow MAE alumnus Nick Argibay at Sandia.

Sandia National Laboratories is home to experts in a variety of scientific and engineering fields, ranging from defense systems to energy and infrastructure, all working to help enhance national security and develop better defense.

When **Terry Aselage** was an engineering graduate student at UF, he'd heard of Sandia, but didn't know too much else about it. When Sandia employees came to speak about the labs, he realized it was where he wanted to work.

In 1984, he graduated and went on to Sandia, where he's been for the last 28 years. He currently works as a senior manager in the materials science center, where he oversees a large group of researchers. However, his role doesn't end there.

Aselage also leads the UF Recruiting Team for Sandia. UF is considered a "campus executive university," meaning that Sandia designates an executive to be responsible for the relationship with the university. This relationship has continued to grow with Aselage's participation, and he's enjoyed creating these connections.

"The enjoyable thing about that is getting to know the faculty and establishing relationships, which sometimes lead to collaborations," he said. "I really enjoy getting to meet people in the faculty and understand what they're doing and see how Sandia can collaborate in a productive capacity."

As part of this role, he also heads the on-campus recruiting team, whose members are typically UF grads who go back to career fairs and raise awareness about Sandia's mission and employment. Over the last four or five years, Sandia's hired about half a dozen people from MAE.

"We're targeting the right people, and the fact that they perform well once they're here just speaks to the quality of education they're receiving at the University of Florida and the faculty," he said.

Ph.D. student **Rachel Colbert** is currently interning at the Albuquerque, NM, location doing research on tribology. She started in July 2011 because she wanted to work with experts in her field and see what it was like to work in a government lab setting.

"It's been great because people are very friendly and willing to help you here," she said.

For example, she said if you need to learn to use a new piece of equipment, there's bound to be an expert nearby who is able and willing to help.

MAE alumnus (Ph.D.) **Benjamin Griffin** works as a senior technical staff member at Sandia. He was interested in doing defense-focused research and was drawn to the microfabrication work being done at Sandia's Microsystems and Engineering Sciences Application facility. His experience with co-workers has been similar to Colbert's.

"Everybody I work with at my level has a Ph.D. or has a master's degree and has been there for 10 years," he said. "You surround yourself with a bunch of smart people, and you'd be surprised how much that affects your performance and how much you learn."

Bradley Bon, another MAE alumnus (Ph.D.), is a research and development engineer at the Livermore, CA, location. He said Sandia offers a collaborative work environment in which experts are accessible by just giving them a call or knocking on their office doors. He's happy and proud to work in this setting.

"Sandia's technological development and extensive scientific research have contributed greatly to our nation's national security, both militarily and through energy technologies," he said. "I feel honored to be a part of Sandia's engineering heritage."

In order to accomplish such feats, Sandia researchers always have new problems

to solve, he said, and they each require their own series of experiments and numerical simulations. It's this challenge and the wide range of opportunities that appealed to **Casey Barnard**, a MAE Ph.D. student who's interned for three summers at Sandia and is currently involved in the Campus Executive Fellowship program.

Barnard's research involves the design, fabrication, packaging and calibration of MEMS transducers. Over the course of the three summers, he was able to work on 12 different projects in varying degrees of involvement.

"I think it's nice that there are so many different things going on, and you can be involved in the different levels and still gain something from each one of them," he said.

Former president of the Sandia Corporation and former director of the lab **Tom Hunter**, another UF engineering graduate, admired the opportunities Sandia offered.

He worked at Sandia for more than four decades, and he rarely did anything for more than a few years at a time. From field testing to energy work, he said, there was an enormous diversity of jobs.

When he started at Sandia, he worked as a field test engineer, and he's extremely proud of this time in his life because he earned a lot of people's respect and trust.

"I had major responsibilities at a very young age, and I was completely supported by my management," he said.

He went on to become the president and director, which allowed him to represent the laboratory and interface with everyone from fellow lab members to members of Congress. In this role, he was able to support others who wanted to find their passions.

He supported the collaborative environment so many researchers appreciate, hoping that people would contact, engage with and learn from each other. But aside from learning, he stressed that working together would allow people to contribute new perspectives.

"There are always new ways you can look at a problem," he said. "Every time you have people working together, you get this opportunity to see things in a different way, and that contributes to the success of a lot of projects."

Hunter also worked as a Sandia recruiter, hiring dozens of UF students. He recalls the UF students and alumni he met at Sandia as being aptly prepared and enthusiastic about learning new concepts.

He met MAE chairman **David Hahn** during his four years there, as well.

"I remember him as being one of our brighter researchers and being keen on trying to make an impact," Hunter said.

Hahn spent a year as a post-doc at Sandia and three years as a member of the technical staff. When he decided to transition into academia at UF, he remembers Hunter as being very supportive of his decision, and Hahn still considers him a close friend and mentor.

During Hahn's time at UF, he's been happy to see the ties between the university and Sandia strengthen.

"With our role as an executive recruiting school, we are increasingly sending some of our brightest graduates to Sandia," he said. He felt everything came full-circle when **Brian Fisher**, his own Ph.D. graduate student, went to Sandia as a post-doc and actually worked with one of his former colleagues.

David Hahn (center) at Sandia with colleagues Howard Johnsen and Ken Hencken testing an aerosol sensor.

"We just encourage people to get involved with things that interest them," he said, "and it could be research or any other area where there's meaningful national security work to do." – Tom Hunter.

Fisher said his professional progression has been similar to Hahn's, going from post-doc at Sandia to an educational institution. Fisher is now an assistant professor at the University of Alabama after having a great experience at Sandia. He uses the knowledge he gained at the labs to help with his lectures on mechanical engineering topics.

He said that in class, they study a lot of theory, like how thermodynamic cycles work. One day he decided that instead of simply using the textbook, he'd show his students some of the engine data he'd gathered at Sandia. Once he gets into more specialized topics at the end of the semester, he'll present the work he did at Sandia using high-speed imaging to capture how in-cylinder processes really work.

"I hope that's going to turn some heads," he said, "because I think it's pretty cool stuff for them to see."

He truly enjoys teaching and hopes that he can inspire his students.

"Maybe they can go to Sandia and do these things, too," he said. "It gives them something to strive for if it interests them." ▲

MAE alumnus works in aircraft design for 5+ decades

A FEW OF HIS FAVORITE PLANES ARE SHOWN BELOW

HondaJet – Credit to Flickr user Loimere (Derek Hatfield)

F-8U-2 Crusader – Credit to Flickr user curimedia

QUESTAIR Q20 – Credit to Flickr user Armchair Aviator (D. Miller)

When **Ed MacDonough** graduated from UF with a bachelor's in mechanical engineering, there were only six other students alongside him.

It was the year 1937. Franklin Delano Roosevelt was in his second term. "Of Mice and Men" by John Steinbeck was published. World War II was looming on the horizon. And aircraft manufacture was small and early in its development.

Of his classmates, MacDonough was the only one who went into the aircraft industry. It was only about 33 years after the Wright Brothers' first flight.

He went on to work at Chance Vought Aircraft for 25 years, only the start of a career in aircraft design that lasted more than five decades.

"I was fortunate for entering the industry when it was emerging from infancy to adolescence," he said.

"The HondaJet, because I was invited to participate in the design near my 84th birthday and help Honda get started in the aircraft industry. I was 88 when the proof of concept article made its first flight."

"The F8U Crusaders, the first truly supersonic fighters for the Navy and the first airplane to make a supersonic, non-stop flight across the United States. I was Chief Project Engineer for the F8U3."

"The Questair Venture, a two place kit plane holding several world records for its class. Jim Griswold and I were co-founders and co-designers of this 300 mph airplane."

Wartime led to explosive growth in aircraft manufacture. By 1943, it became one of the largest industries, and the Vought engineering department grew from about 60 people in 1939 to about 3,000 people in 1943, MacDonough said. But he was interested in aircraft design long before its rapid expansion. When he was 12 years old, Charles Lindbergh toured the U.S. after he made his first flight across the Atlantic.

"I saw him fly above our house in Jacksonville and decided that designing airplanes would be fun," MacDonough said. He made models out of balsa wood and paper. He went on to college with little money, so he helped pay for his education by getting summer jobs and playing in dance bands. His four years cost $1,325.

During his career, he worked as a chief engineer at Vought Aircraft, became vice president of Vought Industries and even started his own business.

In 1964, he acquired a small manufacturer of aluminum truck bodies and trailers. It had been operating at a loss, but after five and a half years, his team was able to triple the sales volume. He eventually sold it, and after working in the futures market for several years, he went back to his original passion.

"I missed the human interchange of the airplane design process," he said. "That's when I went to Piper Aircraft Corporation in Vero Beach — a chance to go back to Florida."

MacDonough did the basic conceptual work on the Piper Malibu in early 1979, which became the basis for much of Piper's production over the next 30 years.

In total, MacDonough said he's worked on about 40 planes. A few of his favorites include the F4U1 Corsair, the Piper Malibu and the planes featured on the previous page that are paired with his words on why he enjoyed working on them.

Among all of his accomplishments, MacDonough said he's most proud of the fact that he became the person people would turn to for help.

"When I thought I was retiring at age 65, people kept calling me to help on problems that kept me active until age 92," he said.

After a successful career, MacDonough now lives in North Carolina, living a quiet life with family. ▲

continued from page 1

engineering surveying.

"I was doing what I loved," he said. "I was teaching, I was flying airplanes and I was working outdoors while surveying." He did this for 18 months until he decided he better get back to "regular work."

"In my mind, I was goofing off," he said.

Soon he got an interview with Norfolk Southern.

"I was fascinated with all that it took to run a railroad," he said. "They were equally impressed, especially with my UF BSME coupled with my Gator playing days."

He went on to become the director of transportation planning, a job he found suited to his interests of making systems and processes better.

The main part of his current role involves implementing the Unified Train Control System on their railroad. He likened train dispatching to air traffic control and said the UTCS is the best dispatching system for Class 1 railroads.

Its most promising feature is the movement planner, which develops the signaling plan for the trains 12 hours in advance, as opposed to a human dispatcher's typical horizon of 30 minutes. Train dispatching is very complex, and a dispatcher must consider train schedule adherence, engine horsepower, track grade, train priority, siding lengths, crew expiration, scheduled maintenance, etc.

To him, the most difficult part of the job is also the most rewarding: helping dispatchers embrace change and learn the new systems they'll later appreciate immensely.

He's enjoying his job and occasionally visits Florida, like when he volunteered at a football camp in Chiefland, Fla. His father is a huge football fan, so Plonk took the opportunity to mentor other kids like his father had mentored him. He also took the opportunity to go back to the area where he wore orange and blue.

"I am a graduate of three different universities," he said, "but my heart is in Gainesville at UF." ▲

ACKNOWLEDGEMENTS

MAE Annual Honor Roll 2011 – 2012

The Department would like to extend a very special thank you to all of our donors who gave to our annual fund, endowments and to support research or facilities. In fiscal year 2011-2012, we received 201 gifts totaling $390,879.21 from alumni, friends, corporations and foundations. These gifts have a significant impact on the quality of our academic program and the resources we can provide to our students and faculty. The listings in this Honor Roll reflect gifts received between July 1, 2011 and June 30, 2012. If you would like to support the department, please contact Becky Hoover, Director of Development, at 352-392-6795 or bhoov@eng.ufl.edu. ▲

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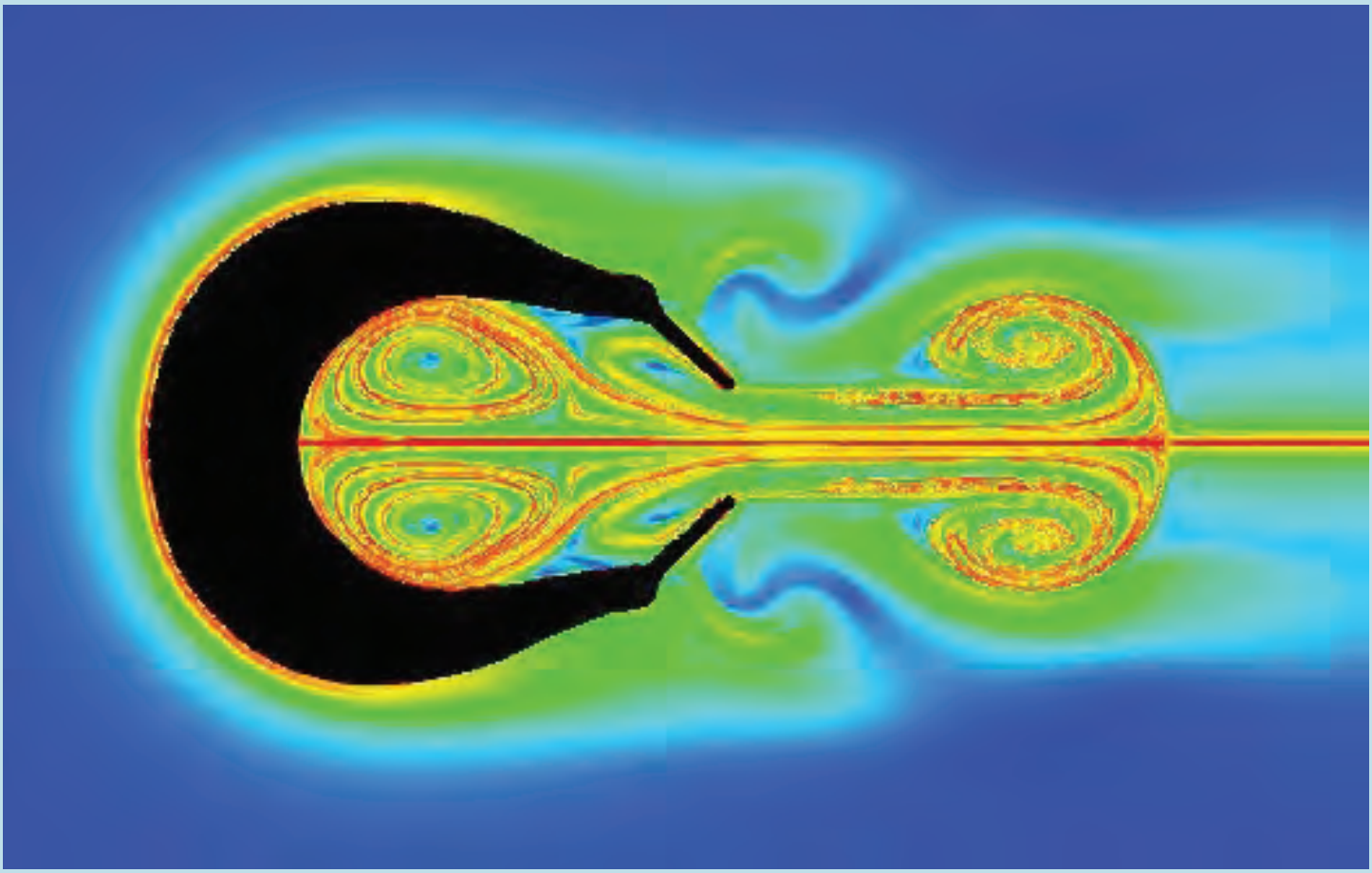

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Managing Editor

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Rebecca Hoover
Development & Alumni Affairs
bhoov@eng.ufl.edu

Holly Franklin
Layout and Design
University Relations

Department of Mechanical
& Aerospace Engineering
University of Florida
231 MAE-A, P. O. Box 116250
Gainesville, FL 32611-6250
352.392.0961

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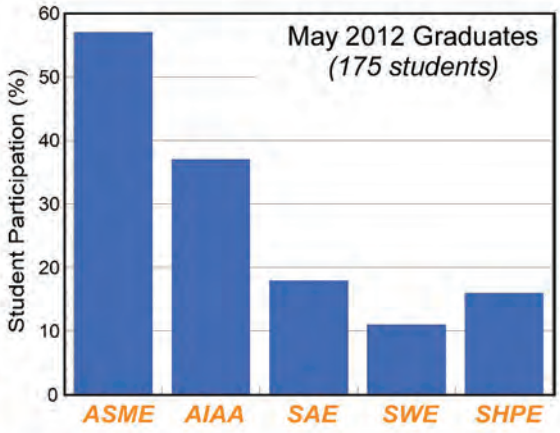
Department of Mechanical & Aerospace Engineering
231 MAE-A, P. O. Box 116250
Gainesville, FL 32611-6250

Snapshot of MAE student participation in professional societies

MAE students at 2012 SWE Conference: Deidre Cheeves, Laura Theobald, Kathleen Hencke, Rachel Rosenblatt, Maggie Owen, Paula Pluchino and Jen Bilsky (l to r).



Ability to function on multidisciplinary teams? (self-assessment)