FALL 2011

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MECHANICAL & AEROSPACE ENGINEERING

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Two teams test experiments in reduced-gravity NASA plane

▲ During the last few parabolas, Jennifer Traylor holds up a sign the team created while joking around. They were allowed to break from their experiment at the end of the flight to have fun in the reduced-gravity environment.

Jenni Stone tried guessing what reduced gravity would feel like.

"I expected it to be like swimming without the water," she said, "but it's not like that at all."

Feeling no physical support for the first time, Stone was in one of two UF teams to float in NASA's "Weightless Wonder," an aircraft that produces the feeling of weightlessness by flying in a parabolic pattern over the Gulf of Mexico.

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UF UNIVERSITY of FLORIDA

Letter from the
CHAIR

Dear Colleagues, Alumni and Friends,

I would like to introduce myself and offer a warm hello to all of our students and alumni. This summer, I accepted the role of Department Chair of MAE and now find myself halfway through the fall semester. As I reflect back on the last five months, it is difficult to believe that time has passed so quickly. I would like to say a few words about my background, about where we now stand as a department, and about the vision of what we hope to achieve.

I joined the former ME Department in 1998, went through the merger with the AEMES Department in 2002, and served as our Associate Chair for Academics for the past three years. I have witnessed dramatic growth in our department over this period; for example, I saw the enrollment in my undergraduate heat transfer class climb from 53 students in spring 1999 to more than 160 students in spring 2009.

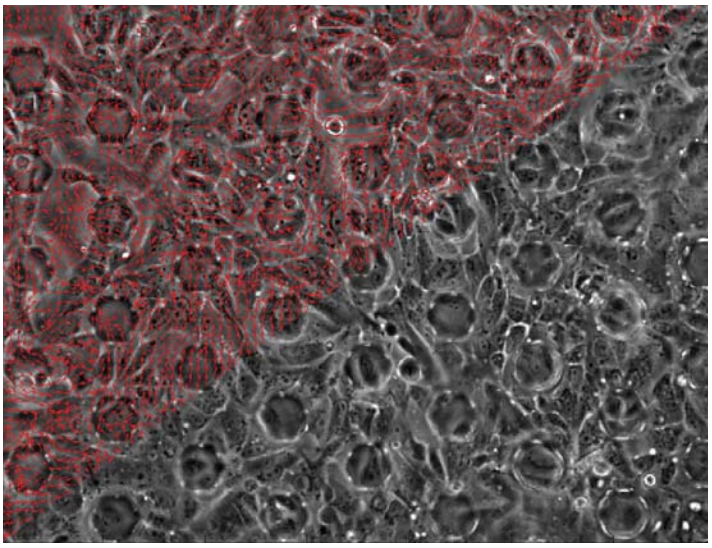
My experiences mirror the department's growth, as shown on the back cover of this issue. With about 1,600 undergraduate students, MAE is one of the largest undergraduate engineering departments in the nation. While our undergraduate and graduate students are an immense source of pride for the MAE faculty, such phenomenal growth brings many challenges, such as burgeoning class sizes. Despite these pressures, I am very proud to report that our department's teaching evaluations and research productivity have actually improved in recent years. Such gains have come largely from the efforts of the MAE faculty, now 50 strong. As we move forward, sustaining academic quality with ever-growing enrollment and maintaining strong ties between students and faculty are among our greatest challenges.

I believe the bonds between our students and faculty are critical to the long-term success of MAE. Accordingly, we have launched a number of efforts to better serve our growing student body. We are nearing completion of a renovation project providing dedicated space for our student societies, including offices, a student conference room, a modest student lounge and space for our design teams. We will soon begin renovation of new space in MAE-C to support the undergraduate labs, senior design and related educational projects. Starting in spring 2012, we are actively working to reduce class size by splitting many of our larger courses into multiple sections, and we have a vision for a large integrated space for our many design competition teams. Our initiatives to grow with quality have benefited from student, faculty and alumni input. I welcome and look forward to your ideas on how we can continue to improve MAE's quality, reputation and productivity.

MAE is thriving with a bright and enthusiastic student body, a dedicated and talented group of faculty members and limitless opportunities. It is truly great to be a Florida Gator!

David W. Hahn
Knox T. Millsaps Professor & Chair
Department of Mechanical & Aerospace Engineering

New professor encourages interdisciplinary thinking in cell lab



A cell monolayer migrates on a micropatterned surface. Stepping back, one can clearly see the hexagonal pattern. This illustrates some of Jolie Breaux's work.

Professor Tommy Angelini subscribes to the insightful but potentially dangerous advice he was given during his post-doc at Harvard: Don't read up too much on it before you try it.

To Angelini, this means using your creativity to discover new methods and ideas instead of falling into the same line of thinking as everyone else.

He decided to use this advice in his very first lab here at UF, made up of six MAE students who examine collective cell mechanics.

The theme of the lab is to think collectively. Instead of considering each cell and its individual properties, Angelini encourages the students to study how cells behave as a group. He does this for one main reason.

"As powerful and groundbreaking as the last 20 years of cell mechanics is … we still don't have a grasp on the consequences of this knowledge in the context of tissues," he said.

This collective perspective isn't the most conventional, but Angelini sees value in using different methods from different disciplines to experiment in his own field of study.

Angelini explains this to his students and says that just reading the books without trying the methods won't get you the answers.

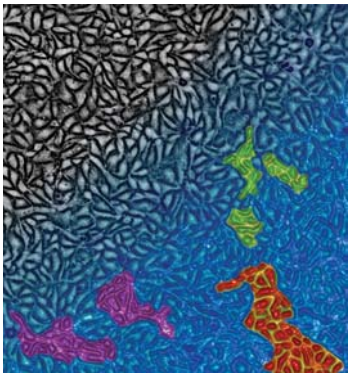
"One thing we can say for certain is that it's going to be really weird, really surprising and really fun," he said. "You really can't lose taking the perspective that we're taking because you're always just amazed at what you discover."

The students have already started discovering new things. **Steven Zehnder's** research might change the way we think about how cells generate and exert forces.

The current thought is that cells pull on one another, but Zehnder found a completely different mechanism — the cells change their volumes dramatically by pumping fluid into one another.

Another student, **Jolie Breaux**, has been researching collective cell migration of micro-pattern surfaces. She found that by merely changing the symmetry of the pattern the cells are on, you can control whether the cells move cooperatively or antagonistically.

All she does is change the pattern from something that looks like rows and columns to something resembling a honeycomb. The surfaces are all made of the same material. Angelini said his mind is blown every day by what the students are finding.



"They probably get freaked out because I'm shouting at them how awesome everything is," he said. "It's the most exhilarating thing to just sit down and look at some new data the students have collected."

Because the lab is still in its newer stages, he said the most rewarding parts are the little things, like seeing the students make steps on their own. His goal is to get them so good at what they do that he won't have to teach them anymore. Then he can start learning from them.

"It makes me really, really happy and really, really excited when I know that they're doing bigger things on their own that just a few months ago they'd never heard of," he said. ▲

Professor Emeritus continues hybrid influence through NAS

Roan's UF team created what could have been the first operational hybrid-electric bus ever made in the U.S. It was operated from the mid- to late-1970s.

After teaching mechanical engineering at UF for 37 years, **Vernon Roan** retired and is now a Professor Emeritus.

His work, however, continues.

Roan doesn't let his extensive knowledge of fuel cells, hydrogen, hybrid vehicles and gas-turbine engines go to waste — he uses it to contribute to peer committees within the National Research Council.

He's currently the review committee chairman for U.S. Drive, which aims to move toward the use of electric, plug-in hybrid and biofuel-using vehicles.

Committees like U.S. Drive, sponsored by the National Academy of Sciences, provide guidance for partnerships between the government and the industries and experts relevant to the issues.

"We think it's a really good idea to have this kind of partnership," Roan said. "The group of people that I'm surrounded by is amazing. They all have wonderful backgrounds, and so everybody can make significant contributions."

Roan has participated in committees like this one since 1994, including the Partnership for a New Generation of Vehicles and the recent FreedomCAR project. Even though their missions are all slightly different, he said, the primary goal is to reduce petroleum imports and greenhouse gas emissions.

The professionals in these committees review governmental programs with large expenditures and make recommendations about how to improve the programs or use money more efficiently.

"We're just trying to do our best as a committee to help guide the programs that the government and industries are instituting," Roan said.

In addition to working with the NAS, Roan has been requested to provide testimony before House of Representatives' subcommittees four times, twice for the Committee on Commerce and Energy and twice for the Committee on Science. Each occasion concerned hybrid vehicles, fuel cells and alternative fuels.

Roan enjoys the work he's been doing and is eager for U.S. Drive to start, but he's most proud of the work he did while working with his students at UF.

Like his current committees, his university projects involved hybrid technology. He was faculty adviser for five Student Competitions on Relevant Engineering teams, three of which were national winners.

The first entry, which was for the Urban Vehicle Design Competition, led to the creation of a small hybrid-electric vehicle. Its success prompted the Florida Department of Transportation to ask if the same hybrid concept could be applied to a bus.

It could. He said his team went on to create what was probably the first operational hybrid-electric bus in the United States under a Florida DOT contract, and they operated it from about 1974 to 1979.

Roan has been influential throughout his life, but he doesn't just work on any project that comes his way.

"If I don't think it's beneficial, and I don't think I have the expertise to do it, and I don't think it's going to be fun, I'm not going to do it," he said.

During his time at the university, he was a mechanical engineering professor and served as director of the Florida Fuel Cell Laboratory. He enjoyed teaching and got along great with his students.

"I really, really liked it," he said. "I always thought that I had one of the best jobs in the entire country." ▲

New Faculty Bios

Tommy Angelini
Assistant Professor
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Tommy Angelini earned his Ph.D. in physics from the University of Illinois at Urbana-Champaign and did his post-doc research at Harvard University. Among his many publications are two recent articles: a review on bacterial biofilms published in the MRS bulletin and a research article on glassiness in collective cell migration published in the Proceedings of the National Academy of Science. Dr. Angelini currently collaborates with researchers at the UF medical school studying the mechanics of wound healing. His research interests include collective cell mechanics within tissues, tissue cell monolayers and bacterial biofilms.

Mrinal Kumar
Assistant Professor
mrinalkumar@ufl.edu

Mrinal Kumar earned his Ph.D. in aerospace engineering from Texas A&M University and went on to work at the university as a post-doctoral researcher. Before going to Texas, Dr. Kumar received his bachelor's degree in aerospace engineering from the Indian Institute of Technology in Kanpur, where he won the Award for Academic Excellence in 2003. One of his most recent accomplishments was receiving the AIAA Open Topic Research Award in 2008. His research interests include stochastic systems and randomized algorithms.

Saeed Moghaddam
Assistant Professor
saeedmog@ufl.edu

Saeed Moghaddam earned his Ph.D. in mechanical engineering from the University of Maryland and did his post-doc research in chemical engineering at the University of Illinois at Urbana-Champaign. Dr. Moghaddam was awarded $1 million by ARPA-E last year to develop a new generation solar and waste heat powered air conditioning system. His research interests include micro/nanoscale transport and nanotechnology for energy science and health applications. One highlight of his research includes the development of the world's smallest fuel cell featured in New Scientist magazine and the 2010 Guinness World Records.

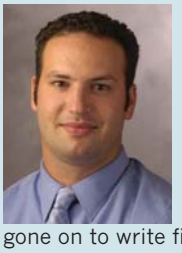
Kamran Mohseni
W.P. Bushnell Endowed Professor
mohseni@ufl.edu

Kamran Mohseni earned his Ph.D. in mechanical engineering and did his post-doc research in the Control and Dynamical Systems group at the California Institute of Technology. He previously taught aerospace engineering at the University of Colorado at Boulder. Dr. Mohseni also serves as the director of the UF Institute for Cyber Autonomous Systems. He's contributed to more than 200 published works, and his research interests include mobile sensor networking, micro-scale transport, and aerial and underwater vehicle control.

DuWayne Schubring
Assistant Professor
dlschubring@ufl.edu

DuWayne Schubring earned his Ph.D. in nuclear engineering and engineering physics from the University of Wisconsin-Madison. He has published 10 journal papers, including articles in the International Journal of Multiphase Flow, the International Journal of Heat and Mass Transfer and Nuclear Engineering and Design, along with 13 conference proceedings. His research interests include two-phase flow, quantitative visualization, nuclear thermal hydraulics and engineering of advanced nuclear reactor systems.

Henry Sodano
Associate Professor
hsodano@ufl.edu



Henry Sodano earned his B.S., M.S., and Ph.D. in mechanical engineering from Virginia Tech. He's gone on to write five published book chapters, provide more than 85 technical presentations and write more than a hundred published articles. Dr. Sodano previously taught at Arizona State University and Michigan Technological University. He has received numerous awards including the NSF CAREER award, ASME's 2010 Best Paper Award in Materials and Systems, a NASA Tech Brief Award and the Virginia Tech 2010 Outstanding Young Alumni Award. His research interests include multifunctional materials, sensors and energy storage.

Faculty Updates

Professor Hugh Fan received the 2011 career award from National Institute of Health. The five-year award of more than $900,000 will allow Dr. Fan to develop a platform for cancer diagnostics and learn cancer biology by working with Dr. Stratford May, the former director of UF Shands Cancer Center.

ARPA-E awarded the University of Florida $3 million with an overall goal of reducing energy dependency. The participants — **Professor James Klausner, Professor Jeorg Petrasch, Professor David Hahn and Professor Renwei Mei** — will focus on solar thermochemical production of renewable fuels from water and recycled CO_2 using concentrated solar radiation to drive the reactor.

Promoted to the rank of Professor
Dr. Nagaraj Arakere
Dr. Oana Cazacu

Promoted to the rank of Associate Professor with Tenure
Dr. Lawrence Ukeiley

Awarded Tenure as Associate Professor
Dr. Subrata Roy

Promoted to the rank of Senior Lecturer
Dr. John Abbitt, III

Congratulations to **Professor Scott Banks**, who was named the College of Engineering 2010/2011 Teacher of the Year!

Congratulations to **Professor Carl Crane**, who was named the MAE Teacher of the Year!

Congratulations to **Professor Ghatu Subhash**, who was named the MAE Researcher of the Year!

The NASA Orbital Debris Programs Office awarded **Dr. Norman Fitz-Coy** and researchers at the Space Systems Group $1.9 million to team up with NASA to design, fabricate and perform an experiment to address the growing global concerns over orbital debris.

InstiGator and SubjuGator make impressive showings at summer competitions

Two UF robots won awards this summer.

The InstiGator, UF's autonomous lawnmower, won first place in the static division of the Annual ION Robotic Lawn Mower competition in June.

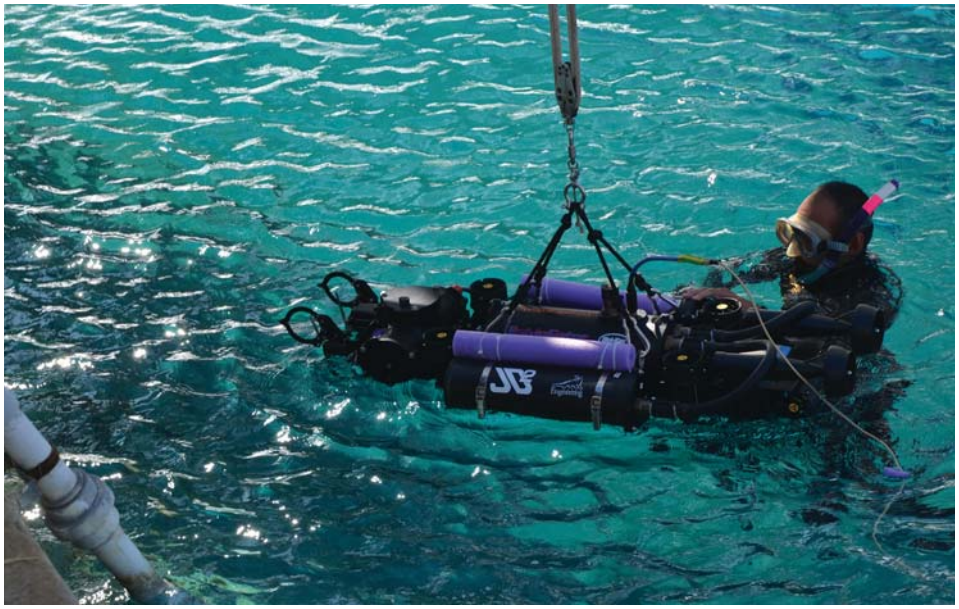
SubjuGator 7, the newest version of UF's autonomous submarine, competed in the Annual RoboSub Competition in July and won third place overall.

Both robots were created by students in the Machine Intelligence Laboratory, which is open to students of any major interested in robotics. **Professor Eric Schwartz** is the faculty adviser for both projects.

The InstiGator uses sonar for avoiding obstacles, a compass for heading information and a GPS for localization. Made up of power wheelchair motors, an ARM processor, and these different sensors, the mower is able to cut the grass of a given area autonomously.

The team was divided into three areas: mechanical, software, and electrical.

InstiGator Team Leader Mike Franks moves the mower into starting position for the qualification run.



SubjuGator 7 is lowered into the water just before one of its competition runs.

Andres Vargas, a mechanical engineering master's student, headed the mechanical aspect and said that competing was one of the most stressful events he's ever experienced.

"From testing at our hotel to losing sleep fixing broken parts to waiting for our turn that day, it was a strenuous rollercoaster," Vargas said.

But he loved taking home a win for The Gator Nation and seeing his ideas take form.

"I had the opportunity to start from an initial concept to a refined prototype on CAD to a fully functional physical platform in about four months' time," he said. "That made things pretty cool for me."

Ph.D. student **Nic Fischer**, one of the team leaders for SubjuGator, also enjoyed the practical applications of working on the robot.

Previous MAE students have worked on creating and re-creating the submarine for 15 years, and the most recent team used past experience to create its own version. They completely redesigned the sub for the first time in more than four years, Fischer said.

The submarine works by using an ARM processor that localizes the position and orientation of the vehicle through the use of sensors. A second primary computer then interprets the information from optical sensors, and the mission commands are converted into vehicle trajectories. Finally, the sub's thrusters propel it through the water.

Cameras serve as the eyes for the robot and help it identify obstacles and tasks in the underwater environment.

After working on SubjuGator 7 for a year, the students brought it to the RoboSub competition and competed against 25 other teams.

"It's cool to see how students from all over the place have the same goals," Fischer said. ▲

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Two teams test experiments in anti-gravity NASA plane

Stone led a team of six Gator undergraduates, who boarded the plane and conducted experiments on July 14 and 15 as part of the "Grant Us Space" flight week, sponsored by NASA's Microgravity University and the National Space Grant Consortium.

The project was **Professor Jacob Chung's** idea, and he went on to organize the team and serve as a technical consultant.

In Houston, the participants first went through 12 days of physiological training, safety briefings and equipment instruction before they were allowed on the plane — the same training NASA employees go through.

The flights were a little less than two hours long and consisted of 34 periods of reduced gravity that lasted for about 17 seconds each. The conducted experiments went flawlessly, said **John Abbitt**, a faculty adviser.

Stone's team characterized the heat transfer and boiling activity of cryogenic fuels that travel in the piping from fuel tanks to spacecrafts — a process necessary for long-range space missions. When fuel hits the pipes, it immediately starts to boil, which hinders the transfer. In order to understand the cool-down process of the liquid, the students had to study the phenomenon in a reduced-gravity environment to account for space-like conditions.

They took video of the microgravity flow patterns using a high-speed camera and gathered data on the maximum wall heat flux both in gravity and reduced gravity.

Stone had to really focus on the experiment while the sensation of floating in the aircraft distracted her. She'd heard that people's first experiences with reduced gravity involved laughing or screaming. She belonged in the former category and found herself involuntarily giggling like a child.

Jennifer Traylor, a junior aerospace engineering major, was a member of the other UF team that performed experiments on the plane earlier in the summer. She said the reduced gravity environment was a once in a lifetime feeling.

"It's almost indescribable," she said. "You could do whatever you wanted. You could pretend the floor was the ceiling and the ceiling was the floor and just have fun with it."

During the first few parabolas, Derek Dussault (left), Dylan Fitzpatrick and Jenni Stone (right) start taking data on their experiment.

Her team — the UF Small Satellite Design club — flew in the "Weightless Wonder" on June 10 and tested the full-access control of small satellites using control moment gyroscopes. Having the ability to more adequately control small satellites would open a whole new field of possibilities for small satellite use in orbit, Traylor said, like being able to help with space debris mitigation.

The experiments performed adequately, but because of the unstable nature of the aircraft movement, it was hard not to get variations in data. Her team's goal is to work on planning for this outside influence and applying to try the experiment out again next year.

Despite this, Traylor was glad to be part of the project.

"I loved it," she said. "I wish I could go again every summer. In fact, I wish I could go every day. It's just a lot of fun."

Stone had a similar opinion and said the experience was unlike anything she could have ever imagined.

"I'm so thankful I was able to be involved in this project and that this opportunity presented itself at UF," she said. "I don't think I'll ever forget the experiences I had out there." ▲

Student-designed tribology experiment returns from International Space Station

From Earth, the night sky is a world of vastness and quiet majesty. From the International Space Station, space is just as impressive — and equally harsh.

Cruel characteristics define the lower Earth orbit environment: atomic oxygen, ultraviolet radiation and a wide thermal range, just to name a few.

Brandon Krick knows exactly how intense space's conditions can be. The UF student played a large role in creating devices for a Materials International Space Station Experiment, a program that involves mounting experiments on the outside of the station to test materials' exposure to space.

Krick, along with the help of a few students and two researchers at the Air Force Research Lab who designed the controlling computers, worked for a year to create the project and submit it to NASA for testing before it launched into space on the Space Shuttle Atlantis STS 129.

The experiments returned to Earth in June after about a year and a half serving as a tribology study. Tribology focuses on the friction of elements rubbing together and the wear that results from this interaction.

During Krick's first year of his mechanical engineering graduate studies, he designed the tribology experiments, which tested different composites, coatings and other materials to see if they'd survive in extreme space conditions. If they endured, these materials would be approved for use in building satellites and other space vehicles.

The samples have returned, but it's too soon to tell the definitive results. However, the PTFE and alumina composition that was part of the experiment — and was actually invented in the labs of UF by **Professor Gregory Sawyer** — showed promising results and can possibly withstand space conditions.

"It's really neat to know something we designed in our lab was on the shuttle," Krick said. "I feel that was a very unique opportunity, and even more unique that we got the experiments back."

But the process of getting the experiments into space wasn't an easy one. The team had to create abnormally small tribometers — devices that measure wear and friction. They're typically the size of a large desktop, but for the MISSE experiment, they had to fit into a 2-inch-by-4-inch space.

The design was difficult, but the payoff was worth it.

"It's very rewarding to know we were able to have something on the International Space Station," Krick said.

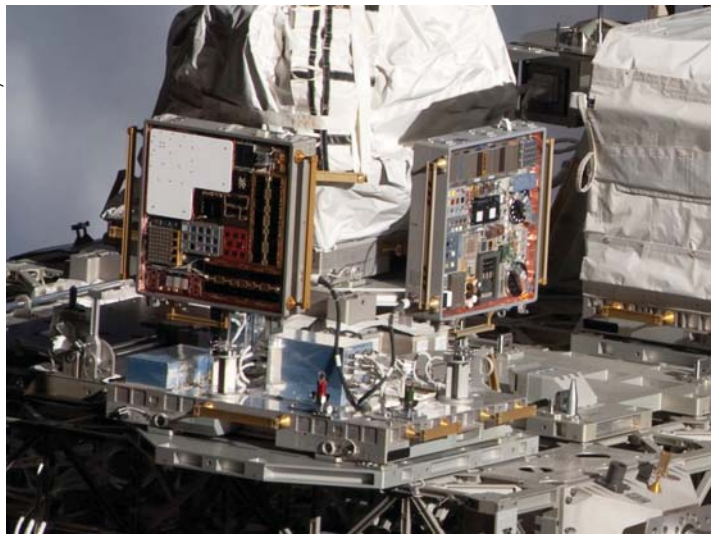
The space tribometer team, led by Sawyer, designed, constructed and implemented the experiment, but there were many layers of people involved with the project.

The number of people participating expanded as they reached each step of the process, Sawyer said.

"There is a general enthusiasm to put stuff into space, so lots of people get involved," he said.

The UF team members didn't want to be solely responsible for choosing which composites to test, so they worked with

Photo courtesy of NASA



Most of the effort of designing the experiments (shown above) was in miniaturizing the tribometers to fit into a 2-inch-by-4-inch space.

about a dozen people in the research community to make the decision.

Now that the results have returned, the team has decided to let industry professionals get the first look in order to give back to the engineering community and allow for better interpretation of the findings.

"We would be missing out on a more complete understanding of the results without the further analysis and testing provided by industry and scientific researchers," Krick said.

Even though some materials tested didn't work as well in orbit, Sawyer explained it simply: That is science. ▲

Student Updates

Raul E. Riveros received the 2011 SPIE Scholarship in Optics and Photonics, 2011 ASME/SME/JSME Manufacturing Research Conference, MSEC2011/NAMRC39 Student Travel Support, and the 2011 NSF Engineering Research and Innovation Conference Student Participation Grant.

Junmo Kang received the 2011 E. Wayne Kay Graduate Scholarship from the Society of Manufacturing Engineering.

Matt Williams was awarded the 2011 Gator of Engineering Attribute Graduate Student Award for Integrity.

Tiffany Reagan was awarded a 2011 NSF Graduate Student Fellowship.

The following students were awarded for their outstanding graduate research:

Brandon Krick for Solid Mechanics Design and Manufacturing

Shawn English for Solid Mechanics Design and Manufacturing

Shubendu Bhasin for Dynamics, Systems and Controls

Matthew Williams for Thermal Sciences and Fluid Dynamics

The following students were awarded for their outstanding doctoral dissertations in 2010:

Nathan Branch for Solid Mechanics Design and Manufacturing

Nitin Sharma for Dynamics, Systems and Controls

Manoj Parmar for Thermal Sciences and Fluid Dynamics

The following students were awarded for being outstanding teaching assistants:

Tim Elmore

Ira Hill

The Society of Automotive Engineers Formula Team placed 6th in business presentation, 14th in vehicle acceleration and 15th in engineering design from among more than 100 teams at the international competition held last May in Michigan. Congratulations to the entire team!

In Memoriam

Our department remembers UF alumnus **Curtis H. Stanton**, who passed away on Aug. 15 at the age of 93. While attending the University of Florida, Stanton earned a bachelor's degree in mechanical engineering and participated in many organizations, including Florida Blue Key, ROTC, Chi Phi, Phi Kappa Phi and Tau Beta Pi. He graduated Summa Cum Laude in 1940.

He started his career in the turbine division of General Electric, where he worked as a test engineer and commissioned turbines for the "Manhattan Project" and worked on projects for the United States Navy.

He then went on to become the general manager of the Orlando Utilities Commission, making him the youngest utilities general manager in the United States. He ran the OUC until his retirement in 1983. The commission named its largest, state-of-the-art power plant after him — the Curtis H. Stanton Energy Center in Orange County.

Stanton served as the president of the Orlando Area Chamber of Commerce and also as the president of the American Water Works Association. He was recognized throughout his life for his accomplishments, including being awarded a MAE Outstanding Alumnus Award, being given a UF Distinguished Alumnus Award and being inducted into the Mid-Florida Business Hall of Fame in 1990.

Paul J. Halyard, who was both a friend and a colleague, said Stanton had a larger than life personality. "He was a force of nature," Halyard said. "He'd never take shortcuts and always did things the right way." But he also remembers Stanton as a man who loved to dance, cook for his friends, ride roller coasters and simply enjoy life.

Stanton was a great student at our university, a gracious contributor to our college and an influential member of his community. He will be missed.

Alumni Updates

Samantha Mirabel,BS '02, MS '03 is a new member of the MAE External Advisory Board, joining us from Harris Corporation. Samantha received her bachelor's and master's degrees in mechanical engineering from UF.

Jeff Riemer,BS '74, has been named the new chair of the MAE External Advisory Board. Jeff is a retired Major General from the USAF, where his many roles included being an F-16 test pilot and the F-22 program executive officer.

George A. Levesque, PhD '09 mechanical engineering, Alumni Fellow, Spring 2010: George has joined Lawrence Livermore National Labs in Livermore, CA, as a post-doctoral fellow in the Extreme Chemistry Group of the Energetic Materials Center, developing hydrodynamic codes.

Nathan A. Branch, MS '08; PhD '10 mechanical engineering, Alumni Fellow and SMART DOD Fellowship, Spring 2010: Nathan has joined the Air Force Research Labs on the Wright-Patterson Air Force Base in Ohio as a staff mechanical engineer in the Mechanical Sciences Branch of the Propulsion Directorate. He is continuing to work on spall propagation behavior of ball bearings and also modeling non-Newtonian behavior of lubricants.

Shawn A. English, BSME '07, MS '09, PhD '11 mechanical engineering, Alumni Fellow and NASA GSRP Fellowship, Spring 2011: Shawn has joined Sandia National Labs in Livermore, CA, as senior technical staff in the Multi-Physics Modeling and Simulations Department.

MAE alumna helps bridge gap between engineering professors and students all over the world

Pamela Dickrell was a UF freshman in 1996 — and she hasn't left the university yet.

During the past fifteen years, she completed her mechanical engineering bachelor's, master's and Ph.D.; became an adjunct assistant professor; worked on post-doctorate research; and met her husband, all at UF.

"I really love it here," Dickrell said. "It's just a really great atmosphere."

In August 2007, she got the job she has today, serving as the director for the Electronic Delivery of Gator Engineering. She's helping the university she loves become accessible to students all over the world.

EDGE, the UF engineering distance-learning program, offers master's degrees, graduate certificates and individual courses for people who want to take classes off campus and at their own pace.

Eight graduate certificates are available, and seven engineering departments offer 20 different concentrations for master's degrees. Students can finish a degree in as little as two years and up to as long as seven years.

EDGE hopes to start two program additions in spring 2012, including the creation of shorter courses.

Dickrell said many people want to learn a new subject without having the time to take a full semester involving homework and exams. Others don't need the college credit. Short courses will offer them the chance to learn specialty knowledge by taking online, eight-to-10-hour classes that aren't tied to certain semesters.

EDGE will also begin offering its first undergraduate feature: an undergrad certificate in nuclear engineering.

In the last three years, students from the U.S., Canada, Mexico, Germany, India, South Africa, Switzerland and Venezuela have participated in EDGE. U.S. military members also enroll with the ability to take classes from wherever they are in the world.

Pam Dickrell poses in the newly redone NEB 100 classroom.

Over the last year, about 700 students participated in graduate distances courses, and the program has seen a more than a 20 percent enrollment increase for each of the last four years.

As the director, Dickrell's responsibilities include finding out what companies desire in terms of the education; working with faculty to make sure they have the proper teaching resources; marketing EDGE and spreading the word about the program; polling students to see if they're satisfied; and supervising the UF staff involved.

Talking to the students is Dickrell's favorite part. She likes hearing about how EDGE has benefited them and where their additional knowledge has taken them.

"If I can expand UF and bring the great experience I had to other people, that's outstanding," she said. ▲

Alumnus races sports cars, supports UF SAE chapter

John O'Steen stands with the newly unveiled SAE Formula One Car.

When **John O'Steen** was young, he read books and saw movies about the famous sports car race Le Mans, a 24-hour endurance race held in France.

In 1984, he got the opportunity to race in Le Mans — and won.

After his racing team took home the gold in its class, he thought it wouldn't get any better. He thought maybe he should retire.

That line of thinking didn't last very long.

O'Steen went on to race for another 15 years. In total, he actively raced sports cars from 1969 to 1999, all after graduating UF with a mechanical engineering degree in 1967.

Other than winning at Le Mans, he also won more than 50 times in Sports Car Club of America events and won his class in several other races, including the U.S. Road Racing Series and the 12 Hours of Sebring.

Now he's looking forward to returning to France for the Le Mans Classic next year.

Even though he enjoyed watching boat races and working at a small engine repair shop after school, he never thought he'd spend a good part of his life racing Porsches.

It wasn't until his senior year at UF that someone truly sparked his interest.

His roommate's brother had a sports car, and O'Steen would go out and watch his races. One day, he had the chance to drive it.

The rest, as they say, was history.

After meeting racers at his job at Proctor & Gamble and buying a $1,400 used sports car, O'Steen started racing in both amateur and professional competitions.

During a race, he could reach speeds up to 200 mph, but that didn't matter too much to him.

"It's not about the speed," he said. "You get used to that. But trying to really get focused and figure out how to get better every time out, every lap — it's a big mental game."

He loves the concentration and competition involved in racing, and even though he received several offers to do it full-time, he always turned them down. He didn't want to take time away from his job, his wife and his kids.

"Overall, I've been very blessed to have a good balance of my professional life, family life and racing career," O'Steen said. "I've done pretty well in all three of them, and that doesn't happen very often."

But even racing part-time was extremely time consuming. During his 17 years at Procter & Gamble, he'd leave after work and go straight to a shop where he could work for hours into the night on his car.

"I think my technical background always helped me because I understood the equipment and how to take care of it," he said.

He places great value on what he learned at UF, especially the time spent in the practical lab courses. He still has the "C" clamp he made in the machine shop lab — one of his favorite classes.

"I believe that the practical experience I gained helped me in both my working career and especially in my racing," he said.

He recently visited the Gator Motorsports shop and saw the SAE Formula One Car, and he was very impressed. He's glad to see the engineering program includes practical applications — something he really appreciated when he was a student.

"Getting that practical experience before they get out of school is just going to make them that much more effective when they go to work at a real job later," he said.

O'Steen and his wife, Judi, have made a $50,000 commitment to name the SAE UF Student Chapter Office, support the Society of Automotive Engineers and support the MAE Annual Fund.

O'Steen still races, but not as often. During his retirement, he travels, goes fishing, visits friends and family, and messes with a few of the cars he still has.

He's also the president of the John & Judi O'Steen Family Foundation and a board member of several organizations.

"I stay amazingly busy," he said. ▲

UF mechanical engineering alumnus works as NASCAR crew chief

As a kid, **Kenny Francis** didn't ride his bike — he raced it. He started go-kart racing at the age of 8, and he realized his interest in cars before he even hit middle school.

"It was kind of a natural thing to race," he said.

During his high school years, he hung out at local race shops around people who created cars for a living. He watched one man build engines and found inspiration in his work.

"I got to be around some pretty creative people early on," Francis said.

This sparked his interest in the design and engineering of vehicles, which led him to what he does today.

Francis, a MAE alumnus, is the crew chief for the 4 Sprint Series car, driven by NASCAR driver Kasey Kahne. He currently works for Red Bull Racing, but he's moving to Hendrick Motorsports — an organization with drivers like Jeff Gordon, Jimmie Johnson and Dale Earnhardt Jr. — in 2012.

He's had about 10 wins working with Kahne, and he hopes to tack on a championship in the future.

His team builds its own cars, and most of the construction is done in-house. One of his main responsibilities as crew chief is to oversee the design and creation of the cars and make sure the process is heading in the right direction.

There are dozens of decisions that need to be made and even more rules that restrict the way a car can be built. The best cars are the ones that can handle the best, Francis said, which are the cars with good aerodynamics, engine cooling, weight distribution and other characteristics that all work together to create the best speed and handling.

The trick is to make the fastest car within the racing guidelines. Francis steps in to check everything out and make sure there aren't any errors or engineering inefficiencies before things are finalized.

He said having a mechanical engineering degree gives him an edge when it comes to this and many other aspects of his job.

When he enrolled in UF in 1987, his intent was to be a driver, and he competed in races while he was in college. He thought learning more about the process of building the best cars would help him with his racing.

He graduated in 1993, and by 1996 he realized his plan to be a driver wasn't going to pan out. He didn't want to leave the industry, and he used his interest in car construction to craft his current career.

He started working as a team engineer and used the skills he learned from his MAE education.

"At the end of the day, an engineer is trying to do a lot of things," he said, "trying to make the most efficient process, make it as cheap as he can, and as effective as he can."

> *"At the end of the day, an engineer is trying to do a lot of things, trying to make the most efficient process, make it as cheap as he can, and as effective as he can."*
>
> — Kenny Francis

With a background in both driving and engineering, he became a crew chief in 2003. He said every crew chief is different — some have mechanical engineering backgrounds, while others have backgrounds in driving or even nuclear engineering.

"I think that's one of the reasons you see the sport get so competitive," he said. "If everyone did what everyone said, we'd all just run the same."

He was quick to notice the culture of competition that existed in the racing world.

"It's a great way to make a living, but it's not immune to frustrations and struggles," he said.

He described how there was a lot of pressure involved when every week, there's 30 or so guys out there all trying to win the same race. The competition was fierce.

Kenny Francis (right) along with NASCAR driver Kasey Kahne.

"That's what kind of draws you into it, though," he said. "If it wasn't competitive — if it wasn't a challenge — then it wouldn't really be worth doing." ▲

ACKNOWLEDGEMENTS

MAE Annual Honor Roll 2010–2011

The Department would like to extend a very special thank you to our annual fund contributors. In fiscal year 2010-2011, we received 111 gifts totaling $277,594 from alumni, friends and corporations. These gifts have a significant impact on the quality of our academic program and the resources we can provide to our students and faculty. Your generous gifts are deeply appreciated. The listings in this Honor Roll reflect gifts received between July 1, 2010 and June 30, 2011. 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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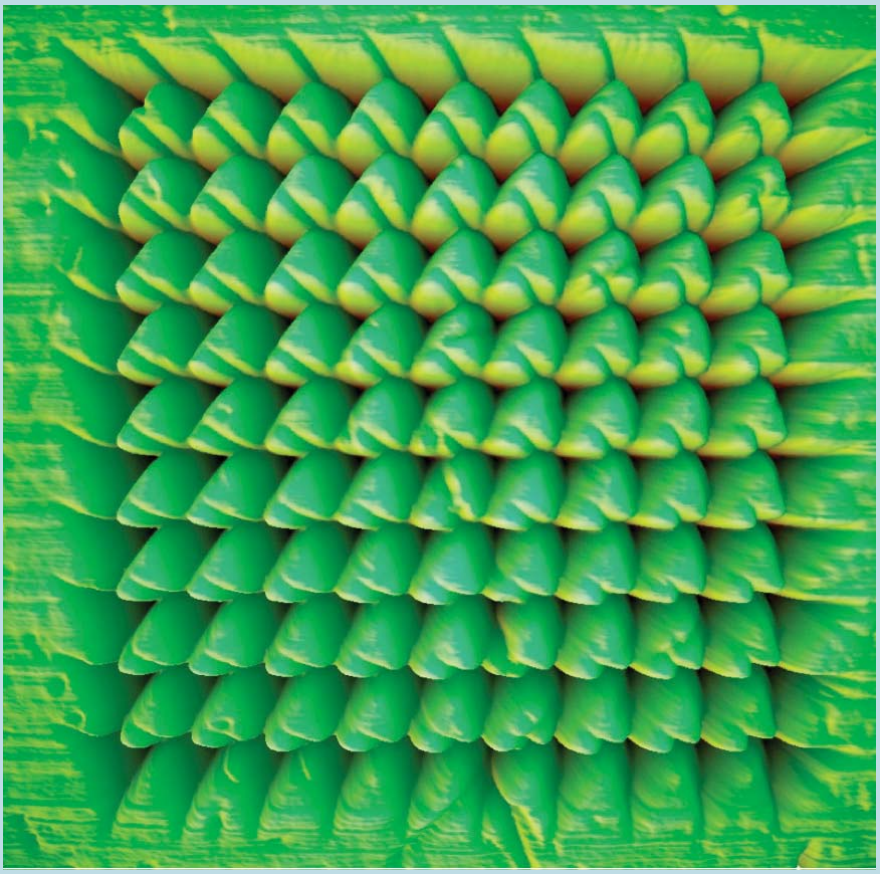

Image of nanopatterned fused quartz from Professor Curtis Taylor.

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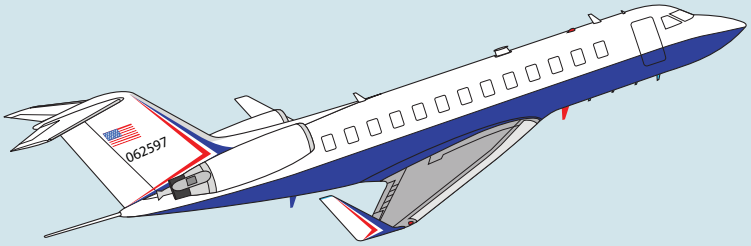

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