In 1977, Natalie Cole released a song called “I’ve Got Love on My Mind.” Well, professionally speaking, I have undergraduate internships on my mind. Since becoming chair, one of my goals is to see the Department of Mechanical Engineering enable a substantial number of our undergraduate students to participate in internships that may involve employment during the academic year. Although a few students have done so on their own, the main stumbling block in establishing a formal internship program is that we simply have not been able to teach our required courses, especially our junior-level courses, frequently enough to meet the needs of students who participate in academic-year internships.

We are now committed to teaching all of our required courses twice a year and many of our sophomore-level courses 3 times a year. This change also helps alleviate the crowding in these courses due to the explosive growth I discussed in the Fall 2014 newsletter. The coop-type program we are establishing is called “ME-Internship.” The details are still being worked out with the Experiential Learning Program and Career Services and will be posted on our web site sometime this summer.

In a 2012 article by Forbes, entitled “Why Co-Op Programs Totally Rock,” the first emphasis is on the added work experience and additional job opportunities that this type of program provides for students. It almost goes without saying that when two students of similar academic background apply for the same job, the one with work experience will usually be offered the position. I also hope that there will be a trickle down effect for all of our students. Having more students in our program with work experience should help to provide all students with a better sense of what real engineering practice is like.

I’d like to close by announcing the retirement of Dr. Anjaneyulu Krothapalli, effective June 15th. Dr. Krothapalli has been an outstanding educator and researcher. He was the seminal ME Chair and laid a strong foundation of excellence on which we are now building. For this reason I often call him the “father” of our department.

New research predicts when, how materials will act

In science, it’s commonly known that materials can change in a number of ways when subjected to different temperatures, pressures or other environmental forces. A material might melt or snap in half. And for engineers, knowing when and why that might happen is crucial information.

Now, a Florida State University researcher has laid out an overarching theory that explains why certain materials act the way they do. And the work has been included as one of the highlights of the past year in a top materials science journal, Smart Materials and Structures.

“The basic idea is if I was going to tell you that I can predict that this piece of material is going to break and you asked me how confident I am this is really true, we have to resort to statistics and probability,” said William Oates, professor of mechanical engineering at the FAMU-FSU College of Engineering. “Ultimately, we would like to say that this material has a 5 percent probability of breaking, for example.” (Continued on page 2.)
Advancements and Updates

(Continued from page 1.) For Oates’ paper, he specifically examined ferroelectric materials. Ferroelectric materials are materials that experience spontaneous electric polarization, meaning the positive and negative charges occur in opposite directions and can also be reversed. Importantly, the change in charge also produces a shape change that provides a novel material that can be used as an actuator or sensor or both simultaneously.

Ferroelectric materials are commonly used in the biomedical industry for viewing inside the body using ultrasound imaging. Scientists are also trying to use them for new solar cells.

"The material is pretty pervasive in a number of fields," Oates said. "So understanding how the material behaves and trying to come up with new compositions is a pretty active area of research."

Like many scientific endeavors, nothing came easy. His original paper laid out a significantly different theory and was rejected by the journal, so he had to completely go back to the drawing board.

He then stumbled across a quantum theorem and began working with it, comparing quantum simulations of electronic structures with continuum theories often used in engineering design.

It gave him the answers he needed and a stronger backing for a more unified continuum theory that is much faster to calculate relative to quantum mechanics. However, continuum approximations still contain uncertainty.

To address this issue, he used a special statistical method, known as Bayesian statistics, to quantify confidence in the model’s predictive power.

"With this new tool, we can apply it to all sorts of materials and basically quantify how good are we as engineers at approximating nature without spending countless numbers of hours on a computer," Oates said.

Kathleen Haughney

Mechanical engineering chair honored at Black Engineer of the Year Awards

A Florida State University engineering professor has received a prestigious honor from the Black Engineer of the Year Awards (BEYA) for his work in educating students and building the Department of Mechanical Engineering at the FAMU-FSU College of Engineering.

Emmanuel Collins, chair of the Department Mechanical Engineering, received the Black Engineer of the Year Award: 2015 College-Level Promotion of Education.

“It’s a great honor, and it brings more visibility to the department and college,” Collins said.

African Americans make up about 13 percent of the U.S. population, but only earn about 5.2 percent of engineering degrees awarded to U.S. citizens, according to BEYA. The purpose of BEYA is to shed light on the underrepresentation of minorities in STEM fields and to honor successful and talented scientists.

“Emmanuel Collins leads one of the top engineering programs in the College of Engineering and has been very effective in generating interest in STEM among women, racial and ethnic minorities,” said Yaw Yeboah, dean of the College of Engineering. “His greatest impact has been in the production of minority and female engineering doctoral students.”

Collins is the John H. Seely Professor of Mechanical Engineering and the director of the Center for Intelligent Systems, Control and Robotics (CISCOR). He received his doctorate in aeronautics and astronautics at Purdue University and also earned degrees from Morehouse College and the Georgia Institute of Technology. He worked at Harris Corporation prior to joining the College of Engineering in 1994.

Among Collins’ accomplishments is serving as director of the FSU chapter of the Florida-Georgia Alliance for Minority Participation Program, which aims to increase retention of minority students in STEM graduate programs.

In addition to his work with College of Engineering students, he has led extensive community outreach efforts to interest local elementary, middle and high school students in science. CISCOR has worked with SAIL High School’s robotics team and has held multiple campus workshops and camps for local students interested in science.

Kathleen Haughney
Get to know your Professors and Faculty: Accomplishments

Mechanical engineering professor co-authors most downloaded paper

Dr. Cheryl Xu, associate professor in mechanical engineering, FAMU-FSU College of Engineering, is co-author on a paper that was the most downloaded article in Sensors and Actuators A: Physical (a top journal in the field of sensors) in the last 90 days.

Most Downloaded Sensors and Actuators A: Physical Articles

1. Temperature sensor made of polymer-derived ceramics for high-temperature applications

Ran Zhao | Gang Shao | Yejie Cao | Linan An | Chengying Xu

Abstract

This paper describes the use of polymer-derived SiAlCN (silicoaluminum carbonitride) ceramics (PDC) to fabricate a temperature sensor for high-temperature applications. A unique sensor head was designed and fabricated with Pt wires seamlessly embedded in as electrodes. Material characterization test demonstrates that the resistance of the sensor head decreases monotonically with surrounding temperature, suggesting its readiness to be used for temperature measurement. In actual experiment (temperature up to 830 °C), the measurement of the PDC sensor demonstrates good repeatability to both unidirectional and bidirectional temperature variations for the total span of 10 h, and its measurement follows closely with the thermal couple measurement. These results demonstrated that the temperature sensors made of polymer-derived ceramics (PDC) have excellent accuracy and repeatability, and can be used in high temperature environment.

Researchers join ranks of AAAS fellows

Two Florida State University researchers — David C. Larbalestier and Harrison B. Prosper — have been elected fellows of the American Association for the Advancement of Science (AAAS).

Larbalestier, one of the world’s foremost authorities in the field of materials science, has profoundly influenced the development of high-field magnets for high-energy physics and other applications, such as magnetic resonance imaging, that have evolved from them.

Larbalestier was elected to fellow for “advancing our understanding of the materials science of high-field superconductors and for developing processing techniques that incorporate this knowledge.”

“I am extremely happy to have received this honor from the AAAS,” Larbalestier said. “Most of all, I’m grateful to all my former students, postdocs, colleagues and collaborators who have worked with me to advance the science, technology and understanding of how to apply superconducting materials to make cutting edge superconducting magnets and who thus have been decisive in making such an honor for me possible.”

Gregory S. Boebinger, director of the National High Magnetic Field Laboratory (MagLab), was instrumental in recruiting Larbalestier and the Applied Superconductivity Center (ASC) to move to Florida State in 2006.

“I couldn’t be happier about this well-deserved recognition of David’s commitment to the advancement of science,” Boebinger said. “The ASC’s partnership with the MagLab’s Magnet Science and Technology Division enables us to lead the world in revolutionizing superconducting magnet technology.”

Emmanuel Collins, chair of the Florida A&M University-FSU College of Engineering’s Department of Mechanical Engineering, praised Larbalestier.

“David continues to distinguish himself as an outstanding scholar, as evidenced by this award,” Collins said. “His career success is an inspiration to the faculty in the Department of Mechanical Engineering.”

Jeffery Seay
Alumni and Student Updates

Alum Andre Neal

Andre Neal earned his Bachelor of Science Degree in Mechanical Engineering from Florida A&M University, Spring 2006. Andre, a Mechanical Engineer with more than 8 years’ experience with The Boeing Company, has an extensive background in project engineering, analysis, testing, and product design and is responsible for the design of components for both Defense and Commercial Programs.

Andre serves as the Boeing Black Employee Association President for the Florida Space Coast Division of Boeing and as the Seminole County Chapter FAMU Alumni President. As well, Andre serves as the FAMU Internship Focal for the Boeing Florida Space Coast Organization. He has mentored students both on campus and off during their internship experience with The Boeing Company.

Andre received the Black Engineer of The Year Award for Modern Technology in 2011, and a Space Flight Awareness Award in 2012 for his exceptional contributions to the advancement of Human Space Flight.

COE Press Release

FAMU engineering seniors awarded 2014 Ford Blue Oval Scholarships

Congratulations to Carren Brown, FAMU senior in mechanical engineering and Nandi Sevillian, FAMU senior in electrical engineering, on receiving the 2014 Ford Blue Oval Scholarship. Ford Motor Company strongly supports higher education and has been a supporter of Florida A&M University (FAMU) for over 25 years.

The Ford Blue Oval Scholarship is an award of $2,000 and is paid directly to the recipient’s school to help offset college expenses. Students who have distinguished themselves through outstanding academic achievement and personal excellence are chosen to receive this honor.

This scholarship award is the result of our recruiters at Ford who are committed to our students’ success academically and professionally. The Ford Blue Oval Scholarship is a benefit from Ms. Brown and Ms. Sevillian having been chosen as summer interns at Ford Motor - Summer 2015.

Again, congratulations to both Carren Brown and Nandi Sevillian on their respective academic achievements.

Kacy Lowe, FAMU University Advancement

Mechanical engineering major Sarah Sweat leads by example to enable, empower, and inspire

Florida State University student Sarah Sweat - a mechanical engineering major, Freshman Interest Group leader, former study abroad student, current International Programs student recruiter and core board member of Dance Marathon - aims to enable, empower and inspire others to be the best that they can be and confidently lead a life that they are proud of.

The Freshman Interest Groups (FIG) Program also has been a large part of Sweat’s academic career. She participated in a FIG during her freshman year and has served as a leader of the Pre-Engineering FIG for two fall semesters, providing guidance to current freshman and educating them on the resources at FSU.

"I feel like I am making a difference in the next FSU generation, inspiring them to get involved, taking advantage of the many opportunities and experiences available to them at FSU," Sweat said.

In addition, Sweat has distinguished herself academically by being named to both the President’s and Dean’s list while studying mechanical engineering and has been inducted into the Engineering Honor Society, Tau Beta Pi.

Katherine Sinner
When Engineering Day rolls around, the observant engineering student notes the many companies that are eager to hire talented engineering majors. This past January, General Motors, Lockheed Martin, Harris Corporation, and the U.S. Navy were just some of the 67 companies present at Engineering Day. These companies come to Engineering Day with the intent of offering students a chance to seek full-time jobs and internships. However, as Mechanical Engineering Senior Russell Hamerski walked from booth to booth at another Engineering Day event, he noticed that Shell was the only company present from the oil and gas industry.

Last summer, Hamerski worked with Shell as a Subsea Engineering intern; unfortunately, he was Mechanical Engineering’s—and Florida State University’s for that matter—only representative. This as well as the lack of other companies from the oil and gas industry present at Engineering Day motivated Hamerski to make a change, and thus the FSU chapter of the Society of Petroleum Engineers was born.

Hamerski began work on making SPE an official organization this past fall with the goal of connecting fellow engineering students, as well as others who are interested, with companies in the oil and gas industry. When speaking about the chapter he says it “gives you a great opportunity to get involved in a student organization as well as network and learn about opportunities available in the oil and gas industry.”

Indeed, one of the major benefits of joining SPE and networking is employment opportunities. As a matter of fact, SPE has already been the link for several students obtaining jobs in the oil and gas industry with members working at companies such as Shell, Exxon, and Halliburton.

Not only is this organization meant to connect students and companies in the oil and gas industry, but it also provides students from various Engineering majors the opportunity to network with one another. While SPE is primarily comprised of Mechanical and Chemical Engineering students, there are Civil, Electrical, and Industrial Engineering students as well as students with non-engineering majors such as Geology and Environmental Science.

As President of the FSU Society of Petroleum Engineers, Hamerski has several plans lined up this semester including potlucks, participation in intramural sports, volunteering events, and other extra-curricular activities. One large event planned this semester is to send 15-20 students to the Offshore Technology Conference held in Houston, Texas. Although the Offshore Technology Conference doesn’t take place until May, it’s currently center stage for SPE’s spring semester plans. It provides a chance for Hamerski and other SPE members to network with professionals who are not only in the oil and gas industry, but also a part of the energy sector in general. Students who attend will also be immersed in discussions on current energy topics. This is an excellent opportunity for SPE members to get more exposure to the oil and gas industry as well as other energy-related areas, but the group would like some support to make attending the conference possible. SPE’s goal is to raise $10,000 for the trip, and thus far they have raised about $4,610 through the College of Engineering and their online fundraiser.

If you’d like to join the Society of Petroleum Engineers, you can contact Russell Hamerski at (207) 317-7267 or email him at rhamerski@fsu.edu. The group meets every other Tuesday in room B135 at 6PM. Meeting dates for the rest of the semester are March 31st, and April 14th and 28th.

The link to the online fundraiser for the Offshore Technology Conference is shown below, and if you are unable to donate it is appreciated if you share the link with those who may be able to: http://spark.fsu.edu/Projects/123/Society-of-Petroleum-Engineers-Student-Conference-Travel

Cindy Stewart
Get Involved

**AIAA:** American Institute of Aeronautics and Astronautics  
http://www.eng.fsu.edu/aiaa/

**SAE:** Society of Automotive Engineers  
http://eng.fsu.edu/sae

**ASME:** American Society of Mechanical Engineers  
http://eng.fsu.edu/asme

**SPE:** Society of Petroleum Engineers  
https://studentgroups.fsu.edu/organization/societyofpetroleumengineers

**EWB:** Engineers without Borders  
http://eng.fsu.edu/ewb/

**SWE:** Society of Women Engineers  
http://eng.fsu.edu/swe/

**NSBE:** National Society of Black Engineers  
http://eng.fsu.edu/nsbe/

**SES:** Sustainable Engineered Solutions  
https://studentgroups.fsu.edu/organization/ses

**Pi Tau Sigma:** ME Honor Society  
http://www.pitausigma.net/chapters/FAMU-FSU-Alpha-Iota.cfm

**Tau Beta Pi:** Florida Eta chapter  
http://eng.fsu.edu/tbp/index.html
We need your help!

http://www.eng.fsu.edu/me/about_us/giving.html

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*Newsletter edited by Andrea Stanley and Cindy Stewart