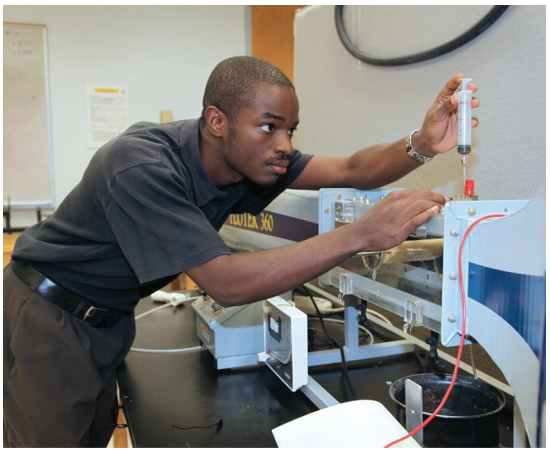
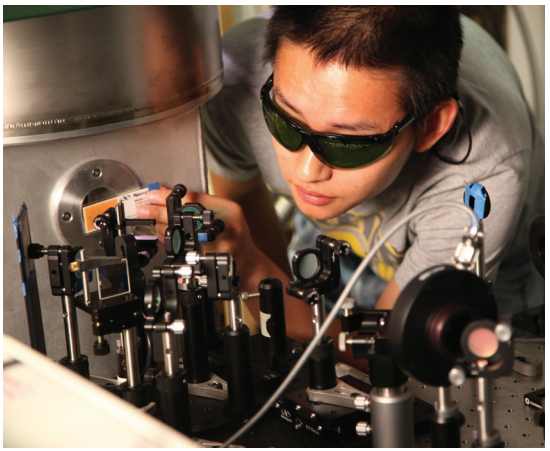




Department of

MECHANICAL ENGINEERING

Our Story, Our Vision

FLORIDA A&M UNIVERSITY - FLORIDA STATE UNIVERSITY
COLLEGE OF ENGINEERING


FLORIDA A&M UNIVERSITY 1982 FLORIDA STATE UNIVERSITY
COLLEGE OF ENGINEERING

Our Story, Our Vision

The Department of Mechanical Engineering (ME) At-a-Glance (2014-2015)

- 21 tenured or tenure-track faculty
  - 1 member of the National Academy of Engineering
  - 7 fellows of national organizations
  - 4 with early career awards
  - (See www.eng.fsu.edu/me/achievements)
- Ph.D. program ranked 27th by PhDs.org
  (using the National Research Council's S-Rankings)
- One of FSU's top 10 undergraduate programs
- 46 Ph.D. students, 27 M.S. students
- 595 undergraduate students
- Over $6M in research expenditures
- 15 postdoctoral associates
- 4 patents, 11 patent applications

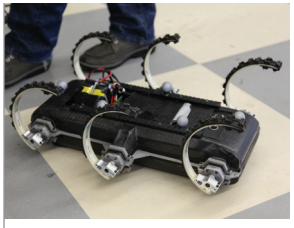
Content

Our Story

Our Vision

Our Story: Timeline

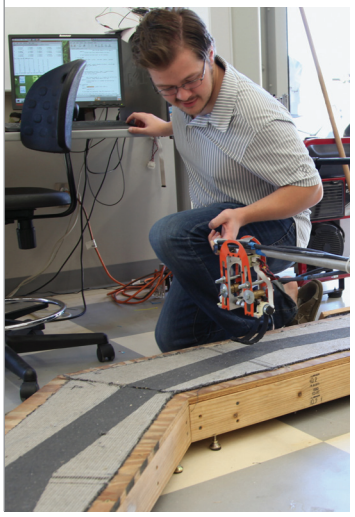
1982



The first class of 35 engineering students was admitted to the recently approved FAMU-FSU Institute for Engineering.

1985

The first Mechanical Engineering graduating class consisted of 2 students.

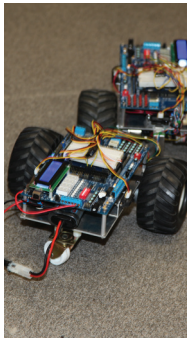


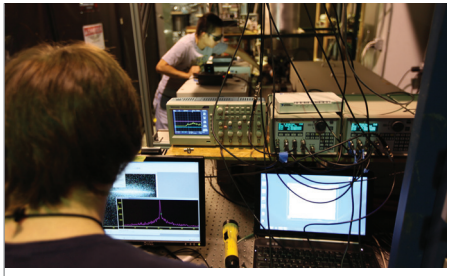
1986

Dr. Anjaneyulu (Yulu) Krothapalli was appointed as chair of ME; he proved to be highly instrumental in building the program during his 15 years in this position.

1988

The Ph.D. program in ME was established.





1993

The first two Ph.D. degrees in ME were awarded.

1998

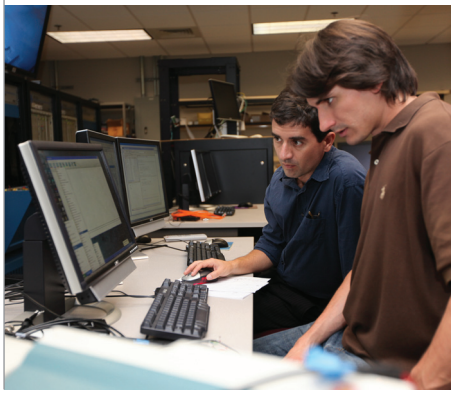
The ME Advisory Council (MEAC) was established.

2001

The Center for Advanced Power Systems (CAPS) was founded.

2002

ME research funding exceeded $5M per year.



The Center for Intelligent Systems, Control, and Robotics (CISCOR) was founded.

2003

2004

The Energy and Sustainability Center (ESC) was founded.

Our Story: Timeline

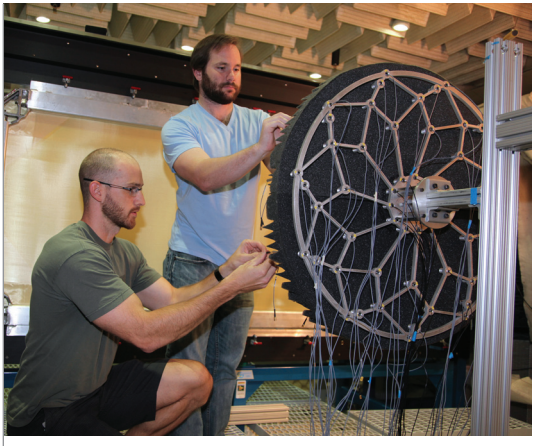
2006

The Applied Superconductivity Center (ASC) moved from the University of Wisconsin to Florida State University.

2009

The Florida Center for Advanced Aero-Propulsion (FCAAP) was founded.

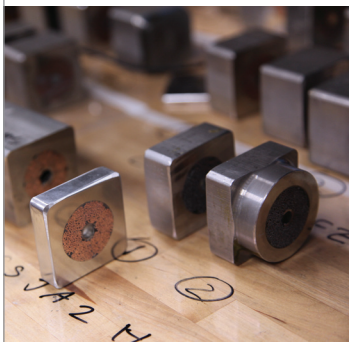
2010

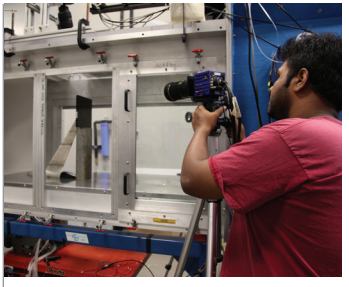


The Ph.D. program was ranked 27th by PhDs.org using the NRC S-Rankings.

2012

The ME Undergraduate Program was ranked by the FSU Office of the President as a top 10 (out of 104) program.





2012

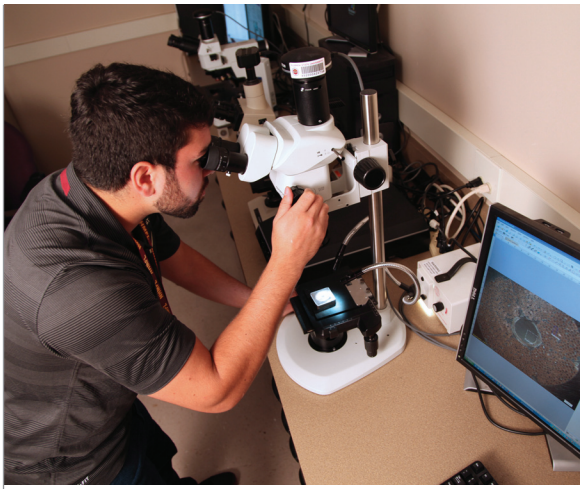
The Aeropropulsion, Mechatronics, and Energy (AME) Center was founded.

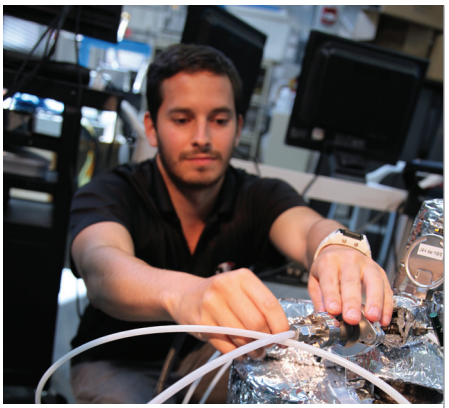
2015

The graduating class for the B.S. program was 111students, an all-time high.

2015

Of the 20 tenured or tenure-track faculty, seven were fellows of national organizations (e.g. ASME), one was a member of the National Academy of Engineering, two held named professorships, and two were distinguished research professors.





2015

"MEnternship", a co-op-type program, was established to help provide ME students with extended internships at companies and government labs.

2015

ME faculty directed 5 research centers (ASC, AME, CISCOR, FCAAP, ESC) and one graduate program, Materials Science & Engineering.

Our Story: Research

Virtually all Department of Mechanical Engineering (ME) research is conducted in affiliation with one of eight multidisciplinary research centers:

- Aeropropulsion, Mechatronics, and Energy Center (AME)
- Applied Superconductivity Center (ASC)
- Center for Advanced Power Systems (CAPS)
- Center for Intelligent Systems, Control, and Robotics (CISCOR)
- Energy and Sustainability Center (ESC)
- Florida Center for Advanced Aero-Propulsion (FCAAP)
- High-Performance Materials Institute (HPMI)
- The National High Magnetic Field Laboratory (NHMFL)

All eight affiliated research centers are within walking distance of the College of Engineering, which is located in Tallahassee's Innovation Park.


NHMFL
ASC
HPMI
AME
FCAAP
CISCOR
CAPS
ESC
FAMU-FSU College of Engineering

Our Story: Research

Aeropropulsion Mechatronics & Energy Center

Aeropropulsion, Mechatronics, and Energy Center

The Aero-Propulsion, Mechatronics, and Energy (AME) Center fosters transformational research programs that span multiple disciplines, while integrating exemplary educational and professional training programs. The aero-propulsion group brings expertise in experimental and computational fluid dynamics along with world class facilities. These facilities include the NSF-sponsored Poly-Sonic Wind Tunnel with an operating testing range inclusive of subsonic, transonic, supersonic and hypersonic flows, an anechoic wind tunnel , and a hot jet facility capable of producing high supersonic jets at temperatures of 2,000° and above. The mechatronics group is known for its integrated robotics design lab, legged vehicle design and modeling, autonomous robot motion planning and control, and control technology relevant to a wide variety of applications. The energy group is led by experts in the development of fuel cells, advanced batteries, supercapacitors, and other energy storage devices.

The AME Center, directed by an ME faculty member, serves as an incubator for cross-disciplinary research involving researchers in the 3 core research areas, as well as faculty and scientists from Mechanical Engineering, Electrical and Computer Engineering, Civil and Environmental Engineering, and other STEM disciplines. An example of this synergy is the application of the mechatronic group's novel optimal adaptive control technology to problems in flow control, a specialty of the aero-propulsion group. The 3 areas also cooperate in outreach programs such as the NSF-sponsored Multi-physics of Active Systems and Structures (MASS) Research Experience for Undergraduates (REU Summer Program).

For more information: *www.ame.fsu.edu*

Applied Superconductivity Center

The Applied Superconductivity Center (ASC) advances the science and technology of superconducting magnets, working from atomic scale fundamentals, through complex conductors to construction of the highest field superconducting magnets yet made. ASC has comprehensive laboratories for superconductor fabrication, superconducting property and microstructural evaluations, and magnet construction and testing. ASC is supported by multiple research grants and collaborations with other universities, national laboratories, and industry, which provide forefront educational opportunities at the undergraduate, graduate, and post-doctoral levels. ASC is a division of the National High Magnetic Field Laboratory, which houses the strongest DC magnets in the world.

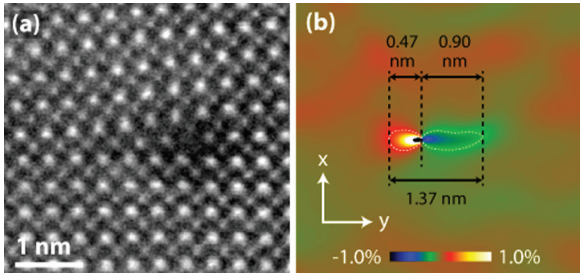
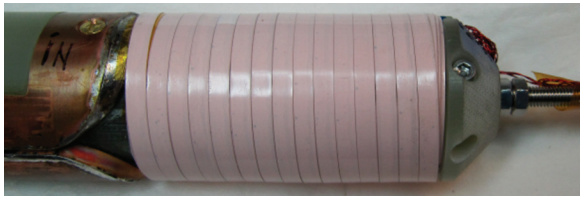


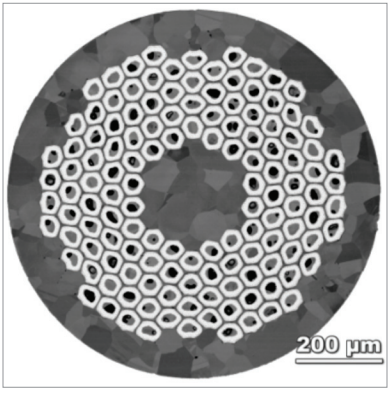
Figure (a) A High Angle Annular Dark Field (HAADF) scanning transmission electron microscope (STEM) image reveals the atomic structure of an edge dislocation at a Ca-doped $YBa_2Cu_3O_{7-\delta}$ low angle grain boundary.

Figure (b) Distribution of tensile (left side of the dislocation) strain field (ε_{xx}) and compressive strain left side. These color maps clearly show that Ca segregation to the grain boundary expands the tensile and compressive strain fields by diffusion barriers. *Images: Fumitake Kametani, staff scientist on films grown by Pei Li, Ph.D. student.*



The world's highest field superconducting magnet is made out of $YBa_2Cu_3O_{7-x}$ tape. It generated 4 Tesla in a 31 Tesla background field at the NHMFL.

Image: Ulf Trociewitz, staff scientist and Matthieu Dalban, postdoc.



Cross-section of a 0.8 mm diameter Nb_3Sn superconducting wire containing ~100 bundles of superconducting filaments in a copper matrix being developed for the High Luminosity upgrade of the Large Hadron Collider at CERN.

Carlos Sanabria, Ph.D. student.

For more information: *nationalmaglab.org/magnet-development/applied-superconductivity-center*

Our Story: Research

Center for Advanced Power Systems

The Center for Advanced Power Systems (CAPS) is a multidisciplinary research center organized to perform basic and applied research to advance the field of power systems technology with emphasis on application to electric utility, defense, and transportation. It has core competencies in the areas of power systems modeling, analysis, and control in the context of real-time digital simulators, power electronics, electrical machines and drive systems, superconductivity, and thermal systems analysis. CAPS possesses state-of-the-art laboratories that embrace the real-time environment, with dedicated facilities based on dSPACE, RTDS, and OPAL-RT computational platforms. CAPS has placed considerable resources and effort into unique FPGA and DSP real-time model and system emulation platforms for highly specialized or nonlinear device applications.

CAPS also places strong focus on the development of a variety of "at power level" demonstration and testing platforms for machines, drives, converters for renewable energy applications, smart grids, distributed grid intelligence, and distributed control. The physical platforms vary from approximately 10KVA ~ 5MVA in power and from 208Vac ~ 4160Vac (0 – 24KVDC).

CAPS resources and faculty capabilities are unique in the United States and are being extensively used by industry, the National Science Foundation, Department of Defense, and other partners. ME faculty working in CAPS have been heavily involved in thermal system modeling and simulation, and power system control.

For more information: *www.caps.fsu.edu*

Center for Intelligent Systems, Control, and Robotics

The vision of the Center for Intelligent Systems, Control, and Robotics (CISCOR) is to use state-of-the-art technology to develop practical solutions to problems in systems, control, and robotics for applications in industry and government. The Center's goal is to provide a means for the State of Florida to achieve national prominence in the area of automated systems and to assume a leadership role in Florida's technology of the future. CISCOR has become a leading center in Florida for the development and implementation of technologies related to intelligent systems, control, and robotics.

CISCOR is directed by a ME faculty member. However, CISCOR faculty come from Mechanical Engineering, Electrical and Computer Engineering, Computer Science, and Statistics. These faculty provide expertise such as mechanical design, dynamic modeling, control, artificial intelligence, pattern recognition, and computer vision. In the field of robotics, CISCOR has expertise in motion planning, terrain identification, object recognition, task allocation for cooperating agents, design of biologically inspired multi-modal legged systems, dynamic modeling of vehicles, haptic interfaces, and teleoperation, as well as a strong foundation of state-of-the-art robotics equipment. Pictured are researchers working on mobility enhancements for electric-powered wheelchairs, a special type of robotic device. CISCOR has control expertise in the areas of predictive control and robust control.

For more information: *www.ciscor.org*

Our Story: Research

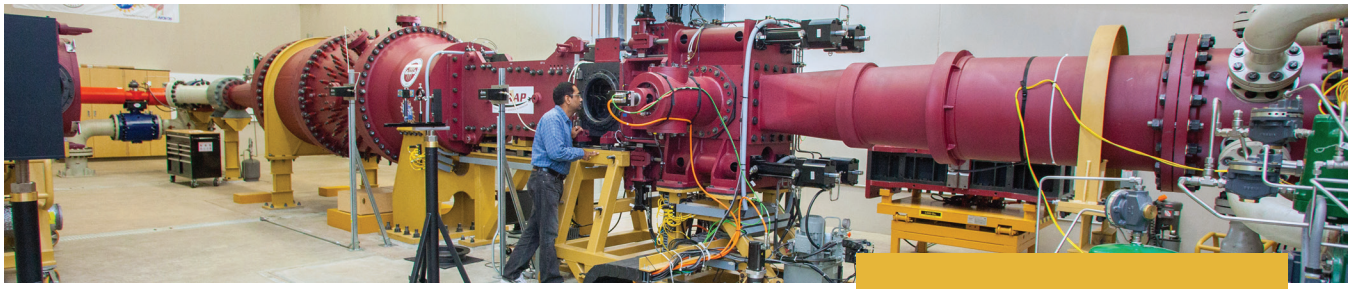
Energy and Sustainability Center

The Energy and Sustainability Center (ESC) addresses the most challenging energy issues related to the use of alternative energy through the development of innovative solutions for consumers and industry. The Center addresses the need for affordable energy systems that have much lower emissions of CO_2 and other greenhouse materials to the atmosphere. Technologies of interest and areas of expertise include: off-grid zero emission buildings, algae photobioreactors, solar-thermal tri-generation systems, waste heat recovery, solar driven power cycles, fuel cells, and thermodynamic optimization of energy conversion systems.

The Off Grid Zero Emission Building (OGZEB) is a major facility in the Energy and Sustainability Center, which was established to address the challenge of alternative energy by developing innovative solutions for consumers and industry.

For more information: *www.esc.fsu.edu*

Florida Center for Advanced Aero-Propulsion



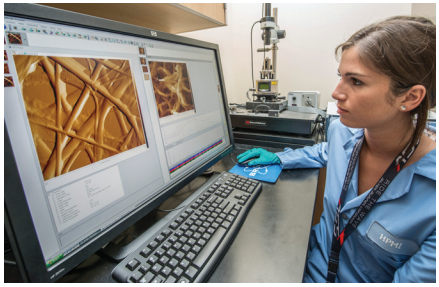
A major component of the FCAAP facilities at FSU is this state-of-the-art Polysonic Wind Tunnel (PSWT), which was the result of an investment of $6 million by the National Science Foundation and Florida State University. The PSWT is large enough to be very useful to industry, ensuring its long-term use and sustainability, yet small enough to be efficiently operated by university personnel for fundamental research. It engages students in multidisciplinary, fundamental and practical problems, and state-of-the-art diagnostics.

The Florida Center for Advanced Aero-Propulsion (FCAAP), led by a ME faculty member, is a State Center of Excellence involving FSU, the University of Florida, the University of Central Florida, and Embry-Riddle University. The principal focus of FCAAP is on aerospace and aviation research and technology, and FCAAP's efforts in this industry are having a major impact on Florida and the entire nation. The Center develops cutting-edge technologies and a technology-savvy workforce spanning a broad range of areas in aerospace and propulsion, including: active flow and noise control, advanced propulsion and power, next generation air-vehicles and systems, as well as education, training, and outreach. Besides the Polysonic Wind Tunnel shown above, FCAAP's state-of-the-art facilities include: 1) a subsonic wind tunnel, 2) an anechoic wind tunnel, 3) a high temperature jet facility, and 4) a short take-off and vertical landing facility.

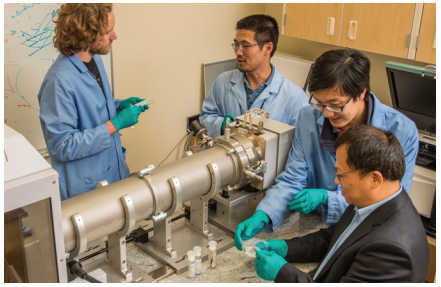
For more information: *www.fcaap.com*

Our Story: Research

High-Performance Materials Institute



The multidisciplinary High-Performance Materials Institute (HPMI) performs research for emerging advanced composites, nanomaterials, multifunctional materials and devices, and advanced manufacturing. HPMI's leading expertise and capabilities include: 1) carbon nanomaterials synthesis and characterization, 2) multifunctional nanocomposites and high-performance CNT nanocomposites, 3) process modeling, quality control and optimization of nanomaterial fabrication, 4) nanomaterial-based sensors and devices for structural health monitoring and biosensors, 5) liquid composite molding and resin flow simulation and optimization, and 6) scale-up nanomanufacturing and advanced manufacturing.



HPMI has comprehensive research resources including field-emission SEM and atomic resolution TEM, multimode AFM, SAX/WAX X-ray, FTIR/UV-Vis/Raman spectroscopies, complete setups of thermal and electrical property analysis, VARTM, hot press and autoclave composite manufacturing, multiple 3D Printer and advanced manufacturing setups, CAD/CAM/CAE modeling and analysis software and mechanical tests, as well as a large high-bay lab for scale-up manufacturing, product prototypes, and demonstrations.

For more information: *www.hpmi.research.fsu.edu or www.hpmi.net*

National High Magnetic Field Laboratory

In 1989 Florida State University (FSU), Los Alamos National Laboratory, and the University of Florida submitted a proposal to the National Science Foundation (NSF) for a new national laboratory supporting interdisciplinary research in high magnetic fields. The plan proposed a federal-state partnership serving magnet-related research, science and technology education, and private industry. The goal was to maintain the competitive position of the United States in magnet-related research and development. Following a peer-review competition, NSF approved the FSU-led consortium's proposal.

The lab's mission, as set forth by NSF, is: "To provide the highest magnetic fields and necessary services for scientific research conducted by users from a wide range of disciplines, including physics, chemistry, materials science, engineering, biology and geology." In line with this, it generates the world's highest DC magnetic fields. ME researchers in the Maglab perform research and development projects involving very low temperature science and technology, relevant to the cooling of superconducting magnets.

The lab focuses on four objectives:

- Develop user facilities and services for magnet-related research, open to all qualified scientists and engineers
- Advance magnet technology in cooperation with industry
- Administer an in-house research program that promotes multidisciplinary research as well as uses and advances the facilities
- Develop an educational outreach program

For more information: *www.nationalmaglab.org*

Our Story: Alumni

FAMU engineering alumna receives big promotion at multi-billion dollar defense contracting firm

Tameika N. Hollis
(B.S. 1998)

Tameika N. Hollis, an alumna of FAMU's mechanical engineering program, was appointed in 2014 to the position of vice president, Engineering, Manufacturing and Logistics (EM&L) for the Advanced Concepts and Technologies Division (AC&TD) in Northrop Grumman Corporation's Electronic Systems sector.

In her new role, she is responsible for the Electronic Systems sector's infrastructure operations including facilities, capital administration, flight tests, the sector affordability team and the Technology Underground activities at the sector's Baltimore Washington International Airport campus.

Hollis joined Northrop Grumman Electronic Systems in 2003 as a systems engineer. After only two months, she was named integrated product team lead for systems engineering, integration, and testing. In that position, she was responsible for the development of all systems engineering tasks and budgets as well as all system-test activities.

In addition to her technical contributions, Hollis was a part of a task force charged with streamlining all the systems engineering processes at the company. Before being hired at Northrop Grumman, Hollis worked for both Raytheon and Boeing Satellite Systems. Hollis earned a bachelor's degree in Mechanical Engineering from FAMU and a master's degree in Mechanical Engineering from the University of Michigan.

Northrop Grumman produces a large variety of products for the U.S. military, including drones, fighter planes, radars, and sensors. Its annual operating revenue is more than $23 billion.

Mechanical Engineering Alumnus Kevin Garvey receives FSU young alumnus award

Kevin Garvey
(B.S. 2006, M.S. 2007)

Kevin Garvey, B.S. '06, M.S. '07, Mechanical Engineering, FAMU-FSU College of Engineering, was among 31 alumni recognized by the Florida State University Alumni Association's Thirty Under 30 young alumnus awards. Garvey was one of the six recipients of the Reubin O'D. Askew Young Alumni Award who were honored at the Young Alumni Awards Dinner in Tallahassee, Fla., June 2014.

Garvey, the Chief Engineer of the Satellite Assembly, Integration and Test Branch,

Department of the Air Force Manassas, Va., is responsible for spacecraft assembly, integration, testing, and launch. He was instrumental in launching numerous satellite systems and fielding a first-of-its-kind intelligence capability that garnered acclaim across government agencies.

A founding member of an interagency mentoring and training group for junior government officers, he helps others network, gain career guidance, and collaborate. Garvey also volunteers at local schools in science, technology, engineering, and math through seminars and speaking engagements.

Piero Caballero wins a best student paper award at 22nd International Compressor Engineering Conference

Piero Caballero
(B.S. 2013, M.S. 2014)

Piero Caballero won 3rd place in the 2014 student paper competition, receiving a certificate of recognition and a cash prize.

Caballero, a Florida State University (FSU) Mechanical Engineering alumnus, submitted a paper based on work he had done in 2013 as a summer intern at Danfoss Turbocor Compressors, entitled "Chiller Control Algorithm for Multiple Variable Speed Centrifugal Compressors."

Piero's entry was one of 30 student paper submissions for this competition. The students are judged based on the technical content of the written version of their paper and the oral presentation during the conference. The Purdue Compressor Conference always has a competition for best student paper.

According to Joost Brasz, Engineering Manager with DTC, the paper was written by Caballero and coauthored with Turner Thornton, also from DTC, and two FSU Mechanical Engineering professors, Dr. Chiang Shih and Dr. Juan Ordoñez. Brasz, who supervised Piero during his summer internship last year, gives all the writing credit to Caballero saying, "All the heavy lifting (work) was done by Piero."

"Both FSU and DTC should feel some pride in Piero's achievement," concludes Brasz.

Caballero joined Danfoss Turbocor Compressors in May 2014 as an aero/thermo engineer.

Melissa Van Dyke, Deputy Manager of the Chief Engineer's Office at NASA

Melissa Van Dyke
(B.S. 1990)

If you'd told her she'd be overseeing a team of NASA engineers for projects like combustion stability on rocket engines, alumna Melissa Van Dyke would not have believed you. Currently Deputy Manager of the Flight Partnership and Programs Chief Engineers Office at the Marshall Space Flight Center, Van Dyke graduated in Mechanical Engineering from Florida State University (FSU) in 1990. While in the Department, she focused on courses geared toward the aerospace industry; thus fluid dynamics and aerospace classes called her name.

Following graduation, Van Dyke landed her dream job of working on launch vehicle

Continued on next page

propulsion systems at Marshall Space Flight Center. Since then, she's worked on a variety of projects at Marshall, including "everything from launch vehicles to the International Space Station." Van Dyke was also a part of the development of the first U.S. facility to test nuclear systems through non-nuclear methods, specifically, simulation of fission heating and power deposition through resistance heating. In fact, she was one of the first two people at NASA to be involved with non-nuclear testing.

In addition, she has worked on a software code used for the world's most powerful turbo machinery, the Space Shuttle Main Engine Turbo Pumps. This code has since been sought after by other government organizations and universities in both the United States and Canada.

Currently, as a Deputy Manager of the Flight Partnership and Programs Chief Engineers Office, Van Dyke is guiding others who are working on several projects such as combustion stability testing for LOX rich staged combustion engines, Orion's Launch Abort System solid rocket motors, liquid engines for planetary landers, and microgravity science glove boxes for the International Space Station.

For her work, Van Dyke has received such awards as the NASA Leadership Medal, the Center Director's Commendation Award, and the Space Flight Awareness Award in Management. While awards are symbols of accomplishment, Van Dyke takes joy in the work that goes into the projects in which she is involved and seeing the team reach their potential when they deliver the product. To her it's important to think about what everyone should be doing as a team and how everyone can interact more effectively to complete the projects at hand. Indeed, when asked what advice she has for future engineers, Van Dyke shares, "Decisions are never made based on technical rational alone. The most effective engineers are those who realize there are other factors that weigh into a decision such as cost and schedule. The most effective leaders are those who understand how people can affect decisions. If your team believes in the same goal and recognizes that everyone wants to make a contribution, you can work through just about anything."

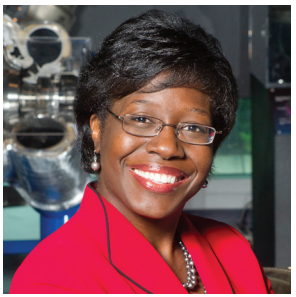
At the Marshall Space Flight Center, Van Dyke's success comes from team efforts. She advises that working toward your goals includes learning from others. "If you want your project to be successful, you must find others who do what you can't," she comments.

Considering her accomplishments, we're on board to follow suit.

The Face of Mission Success at Marshall is: Lakiesha Vessel Hawkins

Lakiesha Vessel Hawkins is team lead in dynamic loads and data analysis in the Structural & Dynamics Analysis Branch, Marshall Space Flight Center.

She received her B.S. in Mechanical Engineering, with a focus on propulsion systems, from Florida A&M University in 1997. She received her M.S. in Engineering Management from the University of South Florida in 2002.



Lakiesha Vessel Hawkins
(B.S. 1997)

As team lead, Hawkins provides guidance and support to a diverse group of analysts, each of whom is recognized as an expert in their respective disciplines. Her team performs structural dynamic, loads, vibroacoustic, and rotordynamic analyses, and analyzes high-speed vibration data for engine and propulsion system components. The team is often called to support other departments within the Marshall Space Flight Center, other NASA centers, and even other agencies with challenging problems industry is unable to resolve. Unique examples include probabilistic methods for assessing the risk of component failure in engine tests and real-time, high-speed engine health monitoring. Hawkins' team directly supports the Human Exploration and Operations Mission Directorate at NASA Headquarters through insight into the Space Launch System core stage, booster and engine development.

The biggest challenge Hawkins faces is how best to help her team adapt to providing technically sufficient analysis products in this new "post-shuttle" era. This new environment is significantly leaner and will require assessment of propulsion designs with fewer traditional hardware and testing opportunities for design acceptance. "We're developing more agile tools and methodologies," says Hawkins, "to ensure the SLS and other new programs are successful while being sensitive to project constraints."

Hawkins' favorite memory at Marshall occurred before she became an employee. Hawkins began her career developing alternate turbomachinery for the space shuttle main engines as a member of the engine prime contractor team. "When faced with a challenging issue," remarked Hawkins, "it was significant to me that my NASA customer engaged as a partner committed to the success of the project. Having an informed customer allowed us to tackle development, certification and flight challenges together as a fully integrated team. Our primary focus has always been on achieving mission success in whatever manner that goal is best realized."

Andrew Zwolinski, Marketing Director at Johnson & Johnson

Andrew M. Zwolinski
(B.S. 2002, M.S. 2004)

Think opportunities to get involved are limited at the COE? Think again. Alum Andrew Zwolinski graduated from the COE in 2004, having earned bachelor's degrees in Mechanical Engineering and Biological Sciences, and a master's in Mechanical Engineering. In addition, he explored the opportunities to put his education into practice. He accented his engineering education in the lab, "studying ways to diagnose and explore biological conditions." He studied the diagnosis of acute myocardial infarction through Micro-Electro-Magnetic Systems. He traveled to Albuquerque, New Mexico for a visit at Sandia National Laboratories, a lab investing in nuclear weapons research and national security. He even studied magnetic fields through flight on a KC135 at NASA.

Zwolinski's career journey has rocketed since his time at the COE. He was an associate Design Engineer at Johnson & Johnson, and has since gone on to lead the company's marketing efforts. Now a marketing director, Zwolinski obtained an MBA which led him into the marketing field with Johnson & Johnson, where he has focused marketing efforts on disease and what the company can do to help those with cancer as well as thoracic conditions.

While Zwolinski has transitioned from engineering to marketing, he acknowledges his time at the COE as a major contributor to his success. Indeed, what he learned at the COE was the basis for what he does now, particularly helping people affected by disease improve their lives.

"I look back fondly on all the opportunities afforded by the COE and I am grateful. I have no doubt that these experiences will continue to help patients' lives improve around the world," says Zwolinski.

Alumni Employers 2000-2015

Accenture
Advanced Cooling Technologies
Air Force
Air Liquide
Alstom Power
American Bureau of Shipping
American College of Chest Physicians
Applid Superconductivity Center
Argonne National Lab
Army Corps of Engineers
Ascend
ATK
Autoridad del Canal de Panama
Babcock Noell GmbH
Baring Industries
BCBSNC
Becton, Dickinson and Company
Belcan Engineering
Bki
BMW
Boeing
Booz Allen Hamilton
Boston Scientific
BP America
Captive Aire Systems
Caterpillar Inc.
CBrinks Gilson & Lione
CD-adapco
Cessna Aircraft Company
Chevron
Cleaver-Brooks
Coastal Steel Inc
Con Edison
Constellation Technology
Cummins Inc
Danfoss Turbocor Compressors, Inc.
Dow Chemical Company
Eaton Corp
Element Mechanical Services
Energy to Power Solutions (E2P)
Entrepreneurship Prep and Village Prep
ESC Services
Ethicon, Johnson & Johnson
EWIE Co, Inc
Exxon Mobile Corporation
Fermilab
FloaTEC, LLC
Florida State University
Ford Motor Company
Forum One Communications
G5 Engineering Solutions
GE Appliances
GE Aviation
General Dynamics Land Systems
General Electric
Georgia-Pacific, LLC
Gerdau
Globalpro Recovery, Inc.
GPI Southeast, Inc.
GS5, LLC
Harris Corporation
Hoshizaki America
IBM
Idaho National Laboratory
iGG
Innate Innovations, Inc
Insititut des Systèmes Intelligents et de Robotique
James Hardie Building Products
John Deere

—Our graduates work for numerous organizations scattered throughout the United States.

Jormac Aerospace
Keurig-Green Mountan
Key Safety Systems
Komatsu
Lockheed Martin
MaxPro Builders, Inc.
Merrill Lynch
Monsanto
Motiva Enterprises LLC
Motorola Solutions
NASA
Nissan Technical Center North America
Norfolk Naval Shipyard
North Carolina State University
Northrop Grumman Aerospace Systems
Ocala Utility Services
Olin Corporation
Oxford Superconducting Technology
P2i
PAC Seating Systems
Parker Hannifin
Pepsico
PricewaterhouseCoopers LLP
Quest Engineering Failure Modeling & Analysis
Ray Dass Test Prep
Raytheon Company
Redbox
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Schlumberger
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Slalom Consulting
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Space Exploration Technologies
SpaceX
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Spinal Elements, Inc.
Spirax Sarco
Spirit Aerosystems
Sto Corp
Sun Hydraulics
Superconducting Technology
TEAM Industrial Services
TECT Corporation
Tect Power
Teledyne Oil and Gas
Texas Center for Superconductivity
THK
Tires Plus Total Car Care
United Launch Alliance
United Technologies Corporation
UPS Supply Chain Solutions
URS Corporation
US Army Corps of Engineers
USPTO
Ventaur Communications
Verizon
Vistakon
Volkswagen
West Pharmaceutical Services
Yates Engineering
Zimmer Edge
Zupt LLC

Our Story

In Other Words ...

"Students graduating from the Department of Mechanical Engineering are well prepared to work in the engineering field. Because they participate in multi-disciplinary design projects that are hands-on and team oriented, they gain experience that prepares them for the workplace. In addition to students graduating with knowledge of mechanical engineering principles, they also gain experience in project management, requirements generation, and team dynamics."

Melissa Van Dyke
EE04 – Deputy Manager
Flight Programs and Partnerships Chief
Engineers Office
NASA/Marshall Space Flight Center
FAMU-FSU ME (B.S.) Alumna

"The Department of Mechanical Engineering provides students the opportunity for a broad education necessary to be successful in the modern engineering world. In addition to developing strong technical skills, students learn how to communicate effectively and work well in team environments. The effectiveness of the program and the quality of the students are why Cummins is an on-going sponsor of Senior Design projects and regularly recruits and hires graduates of the program."

Gregory Kostrzewsky, Ph.D.
Director, Applied Mechanics
Research and Technology
Cummins Inc.

"The FAMU-FSU Department of Mechanical Engineering provided me with team project experience that enabled me to understand the dynamics I would later encounter in the work place. This provided an important career foundation by teaching me to successfully work and manage teams for a common goal."

Tameika N. Hollis
Vice President, Engineering, Manufacturing and Logistics (EM&L)
Northrop Grumman
FAMU-FSU ME (B.S.) Alumna

"Being an Entrepreneurial Project Based company, we are always excited to have the mechanical engineering students lead our multi-disciplinary senior design projects. Every year, the next team exceeds the level of performance of the previous year's team. The Department of Mechanical Engineering is truly graduating engineers who 'Get It!'"

Todd Hopwood
President
Engineering To Go!
FAMU-FSU ME (M.S.) Alumnus

"It is amazing to see the great achievements of the Department of Mechanical Engineering during its relatively short history. The department has strong vision and invests a great deal of effort in achieving its goal of excellence in all of its endeavors. Danfoss Turbocor has collaborated closely with the department since 2007, soon after we re-located to Tallahassee. Our productive collaborations include basic research, senior design projects, internships, and recruitment of their graduates. We have found that the graduates hired by us have quickly developed the needed industrial mindset and competencies and we confidently entrust them with key responsibilities."

Lin Sun, Ph.D.
Vice President of Engineering & Product Development
Danfoss Turbocor Compressors, Inc.

Our Vision

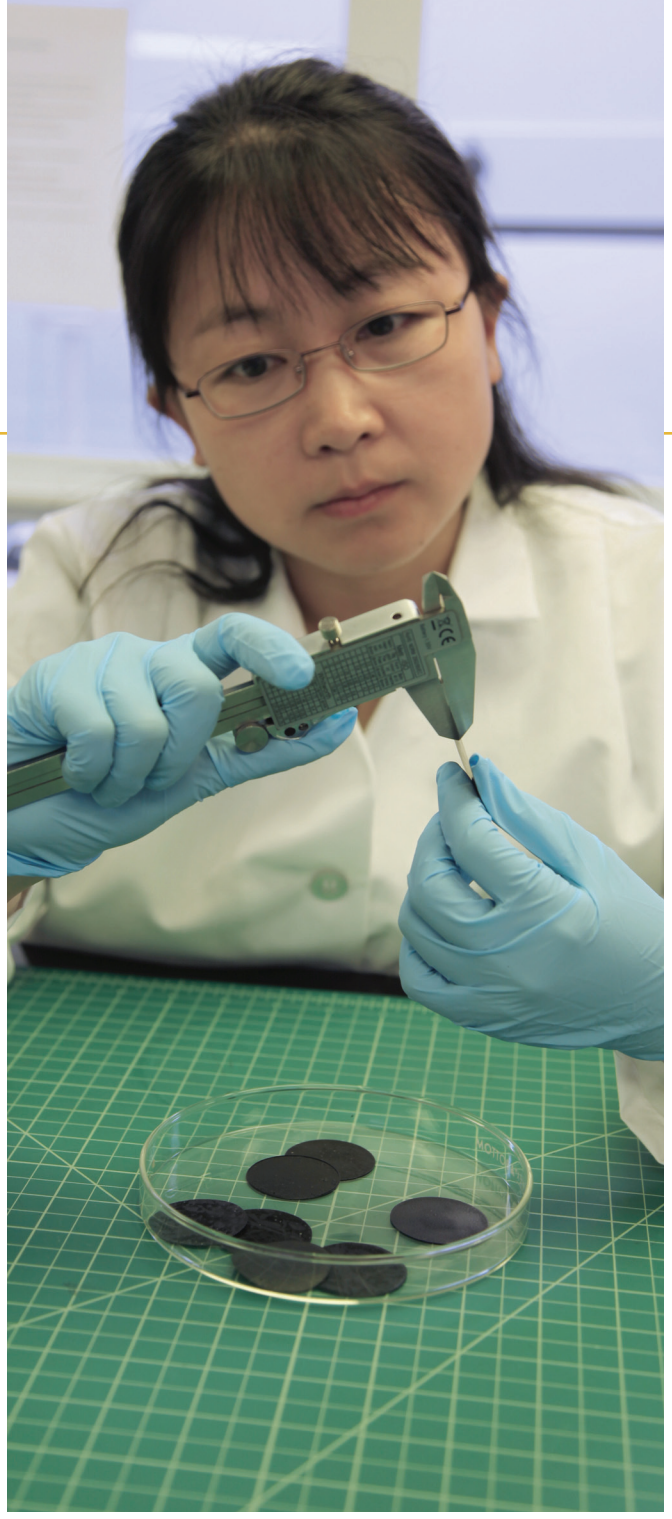
Looking Ahead

To continue developing as a preeminent program, the Department of Mechanical Engineering at the College of Engineering is committed to increasing research, advancing the graduate program, and enhancing the undergraduate experience. Capitalizing on the research and resources at our eight research centers, our students and faculty will remain at the forefront of Aerospace, Energy, Robotics and Intelligent Systems, and Manufacturing.

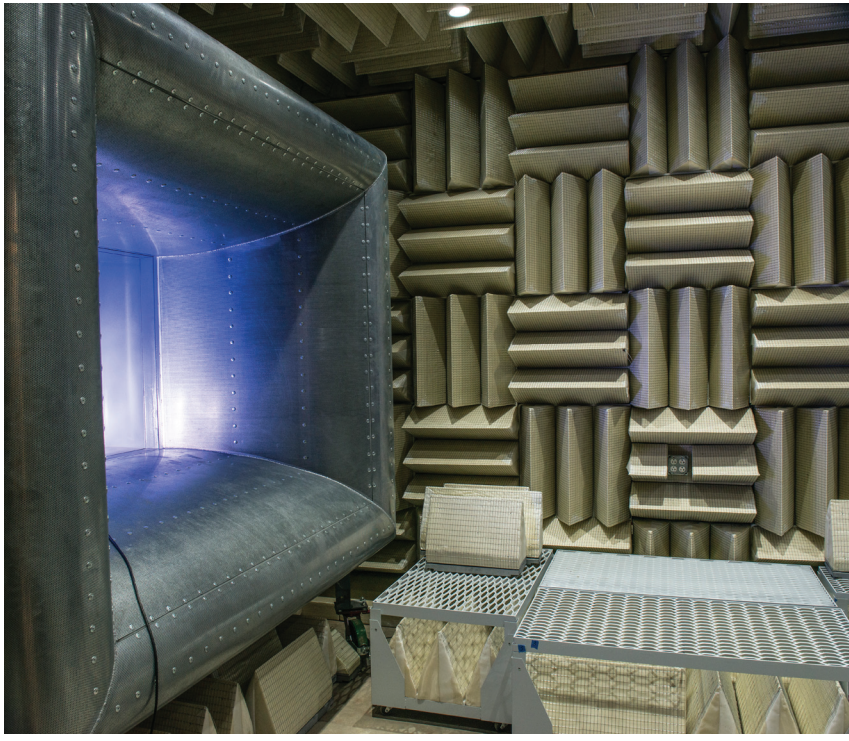
Goals of the Department of Mechanical Engineering include:

- Improving our ranking in recognized classifications of academic departments
- Increasing the technical and leadership preparation of undergraduate students for their careers in industry
- Increasing total annual research expenditures
- Increasing the number of doctoral degrees awarded annually
- Appointing more postdoctoral associates
- Increasing the number of patents awarded

Lab for manufacturing of a temperature sensor made of polymer-derived ceramics featuring Dr. Cheryl Xu; FCAAP 's Subsonic Wind Tunnel and the Anechoic Wind Tunnel.




FCAAP



Our Vision

Aerospace Engineering and Science

The Department of Mechanical Engineering is focused on growing our graduate program in aerospace engineering. With access to unique and valuable resources related to this area of study, ME will be better equipped to address emerging needs with not only research, but with new potential employees. As highlighted below, due to the importance of aerospace in the State of Florida and the ongoing revolution in aerospace technology, a new graduate program in Aerospace Science and Engineering is timely.

- Aerospace technology (space, aviation, and related areas) plays a central role in the Florida economy, which is one of the top four states in terms of employment of aerospace workers.
- The aerospace industry is going through a revolution in commercial space transportation involving greener, quieter, and more efficient aircraft as well as a focus on green energy production (e.g., wind turbines).
- There is a need to train scientists, engineers, and applied mathematicians to be ready for 21st century aerospace jobs if Florida wants to play a leading role; this program will help meet this need.
- Our vision is to work with FSU's Department of Mathematics to establish M.S. and Ph.D. programs in Aerospace Science and Engineering.

Puja Upadhyay, a Ph.D. Candidate and Amelia Earhart Fellow, works on a flow diagnostic experiment in FSU's Florida Center for Advanced Aero-Propulsion (FCAAP) Lab.

Our Vision

Energy Programs

The Mechanical Engineering Department is committed to the advancement of safe, efficient, and sustainable energy sources by developing new energy technologies that are easy to install, environmentally sound, and – perhaps most importantly – inexpensive to produce. Mechanical Engineering is poised to be a leader in the field of energy engineering. As highlighted below, this leadership requires more comprehensive course offerings and expansion of the Energy and Sustainability Center's research.

- While two of the more popular elective courses in ME are Energy Conversion Systems for Sustainability and Sustainable Power Generation, ME seeks to offer more comprehensive course offerings in Energy for both undergraduate and graduate students.
- The Energy and Sustainability Center (ESC) is a focal point of energy research in the FAMU-FSU community.
- Developing a "critical mass" of accomplished energy faculty and furthering the course curriculum in energy are key to increasing the visibility and impact of research in this important area.

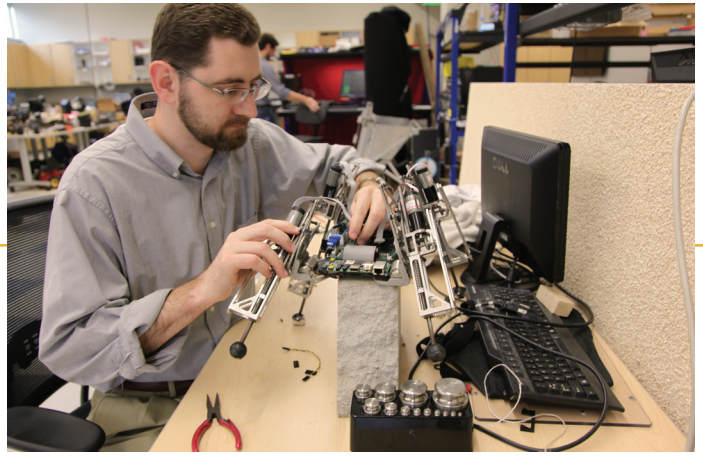
The Energy and Sustainability Center's Off Grid Zero Emission Building (OGZEB) explores the use of solar energy, hydrothermal energy, biomass, fuel cells, and other technologies related to renewable energy.

Our Vision

Robotics and Intelligent Systems

Expanding the robotics and intelligent systems program at the College of Engineering will take a multidisciplinary approach due to the many technologies needed to advance these important fields. Leveraging the strong foundation already laid through CISCOR, this program plans to increase its leadership in Florida in the development and implementation of robotics and control technologies able to adapt to varying conditions.

- Evidence of the success and potential of CISCOR can be seen in the 2014 NSF CAREER Award granted to Associate Director Jonathan Clark. He was also promoted to Technical Lead with the prestigious Army Research Lab RCTA program.
- The Center for Intelligent Systems, Control, and Robotics (CISCOR) faculty come from Mechanical Engineering, Electrical and Computer Engineering, Computer Science and Statistics. The ME faculty teach several undergraduate and graduate level courses in robotics and control that are relevant to students in the aforementioned departments.
- We envision an expanded program that involves multiple disciplines and faculty who specialize in technologies that enable increased competency in areas such as computer vision, human robot interaction, artificial prostheses, adaptive systems, etc.
- We also envision further development of smart control technology that adapts to changing nonlinear dynamics and applying this technology to a variety of problems such as flow control, power system control, automotive engine tuning, and process control.



Robots in the Center for Intelligent Systems, Control, and Robotics (CISCOR) have various forms and sizes. Since 2001 CISCOR has been a part of one of the largest robotics research programs in the world: the Army Research Lab Robotics Collaborative Technology Alliance. This program was renewed in 2015 for an additional 5 years.

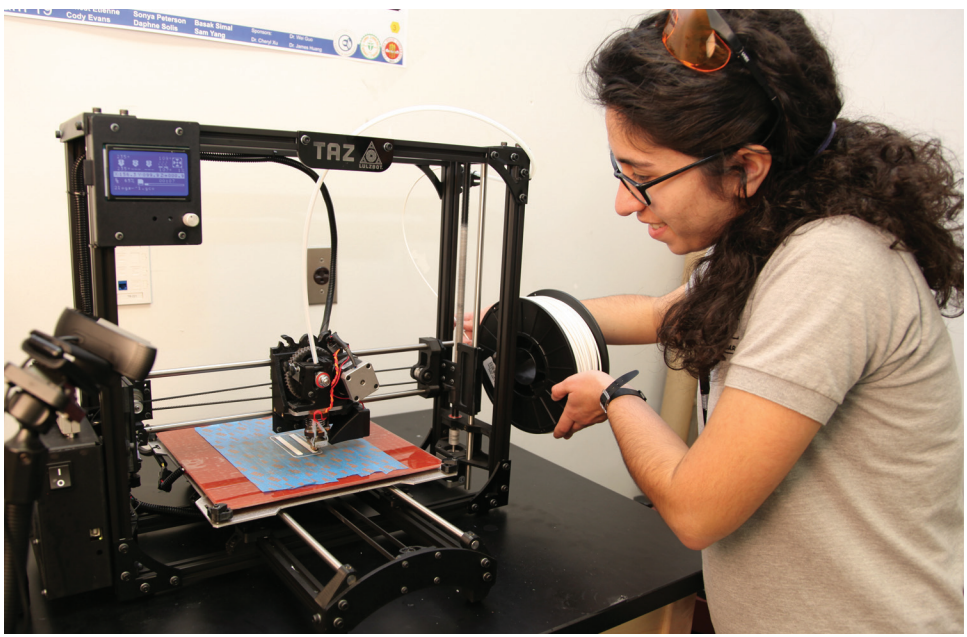
Our Vision

Advanced Manufacturing

An expanded advanced manufacturing program in Mechanical Engineering is needed in order to help the US economy grow by developing competitive advanced manufacturing technology and supplying industry with engineers trained in these advanced manufacturing techniques.

- Current manufacturing research in Mechanical Engineering (ME) is associated with the High-Performance Materials Institute (HPMI) and includes the development of emerging additive manufacturing processes and materials to fabricate a new class of multifunctional ceramic nanocomposites and novel aerospace structures and medical devices.
- There is also a low-cost manufacturing initiative (LCMI) that investigates the use of natural materials – for example, bamboo and cassava – for cost effective manufacturing of bionic and metal products.
- As manufacturing is highly important to the US economy, we envision the growth of LCMI and ME manufacturing research expanding to encompass advanced techniques such as biomaterials manufacturing, digital manufacturing, and sustainable manufacturing.
- Additionally, to better train students for future industry needs, we intend to expand our manufacturing lab to include state-of-the-art equipment for tasks such as micro machining, nanomanufacturing, and customized additive manufacturing.

Dr. Peter N. Kalu and Dr. Kischa S. Reed (FAMU Allied Health) testing bamboo for its mechanical properties for exoskeleton design and manufacturing.



This additive manufacturing testbed in Dr. Cheryl Xu's lab is capable of manufacturing freeform shapes and controlling microstructure and properties for metal, ceramics, or metal-ceramics joining structures.

Our Vision

Engineering Design Lab

At the beginning of the 2014-2015 school year, we established our first Engineering Design Lab to create a work space for students to learn via a hands-on approach. It provides a unique facility for students to work on projects that are symbiotic to their classroom learning.

Although still in its formative stage, we see this space growing into a state-of-the-art engineering design lab which will facilitate a more comprehensive learning environment for students.

- This lab will include state-of-the-art collaborative work benches, key engineering analysis equipment (e.g., signal analyzers and oscilloscopes), and important design software on resident computers.
- As design is such an important part of engineering, it is proposed that a unique building or building module will be dedicated to senior design.
- Ultimately, this design lab will enable students to be better prepared for industry.

At Senior Design Day, a senior ME student assembles a working prototype of a magnetically coupled pump system for a project sponsored by the Florida Space Grant Consortium and NASA Marshall Space Flight Center. The pump is designed to mix cryogenic fluids in a space vehicle's cryogenic tank without adding heat to the system.

Our Vision

Industry-University Collaboration

Mechanical Engineering provides strong leadership to the College of Engineering (COE) in Senior Design, which has become increasingly multidisciplinary. Over the past few years, the number of design teams has steadily grown. In the 2014-2015 academic year, the number of projects was at an all-time high of 33.

- We envision an Engineering Design Leader with strong industrial experience and a mandate to improve our industry collaboration, providing even more multidisciplinary projects and additional real-world projects that can be solved by one of the many COE-related research centers.
- This new position will also work with the COE Entrepreneur-in-Residence to encourage commercialization of both faculty research and senior design projects.
- Our vision is that the person occupying the position of Senior Design leader will fulfill the role of "Industry-University Liaison and Facilitator" and will help to bring about our vision of a multidisciplinary regional engineering design hub that integrates industry participation and experiential learning for workforce and economic development.

This new pedibus design was the result of a ME senior design project in academic year 2014-2015. Project sponsor was Capital City Pedicabs of Tallahassee, Florida. This is one of many senior design projects that has the potential to be commercialized.

Our Vision

Student Programs

- Mechanical Engineering provides support to students attending competitions and conferences through several student organizations including: the American Society of Mechanical Engineers (ASME), the Society of Automotive Engineers (SAE), the Society of Petroleum Engineers (SPE), and Pi Tau Sigma (the ME Honor Society). It is our vision that this support will increase substantially, enabling us to facilitate more opportunities for students' extracurricular professional and leadership development.
- The ME curriculum, like all engineering curriculums, is challenging, which led us to establish the ME Help Center. The Help Center is staffed with tutors to assist students who need additonal help in any ME undergraduate course. We envision more paid tutors in the future to enable the center to have an even greater impact on retention and reducing the time to graduation for ME undergraduates.
- ME is committed to diversity. Hence, we envision working more with FAMU as well as FSU to attract women and minority students and help support those in need of departmental scholarships.

For more information on how to give: *www.eng.fsu.edu/me/about_us/giving.html*

Students taking advantage of the Mechanical Engineering Help Center; the 2014 SAE Baja race car; members of the newly created Society of Petroleum Engineers (SPE).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Giving to Mechanical Engineering

Private support plays an important role in growing the department's dynamic learning environment.

Every gift, regardless of size, is a vote of confidence for the Department of Mechanical Engineering (ME) and the FAMU-FSU College of Engineering. Private philanthropy helps to continue the College's mission of providing the best engineering education by enhancing student access and resources, broadening community outreach, expanding extracurricular opportunities, and increasing faculty distinction.

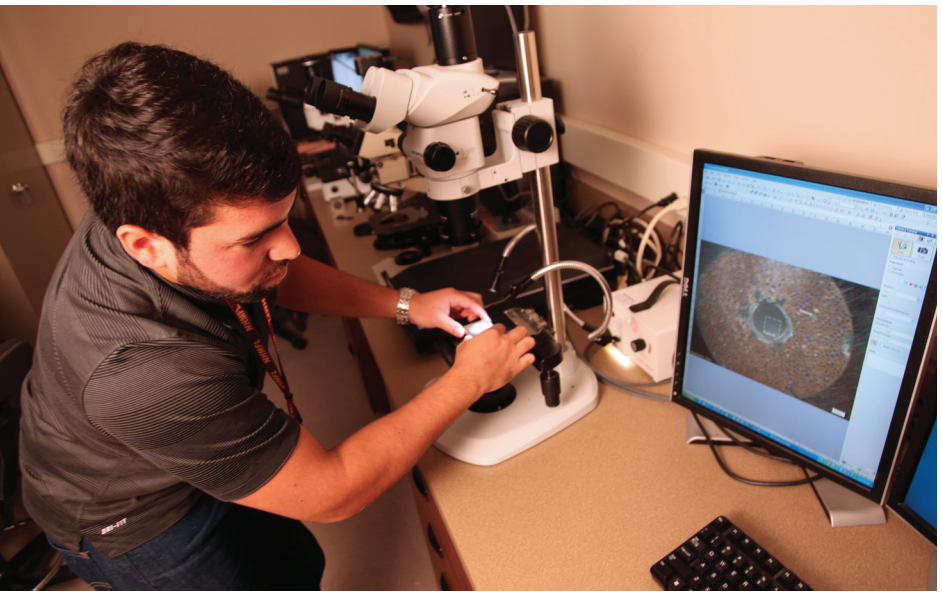
Annual Gifts. Gifts made in a given year help address the immediate needs of the College and the ME department. Annual gifts help provide funding for scholarships and stipends; technology upgrades, lab equipment, and research initiatives; support for senior design projects; student organization support for conference travel and registration; and much more.

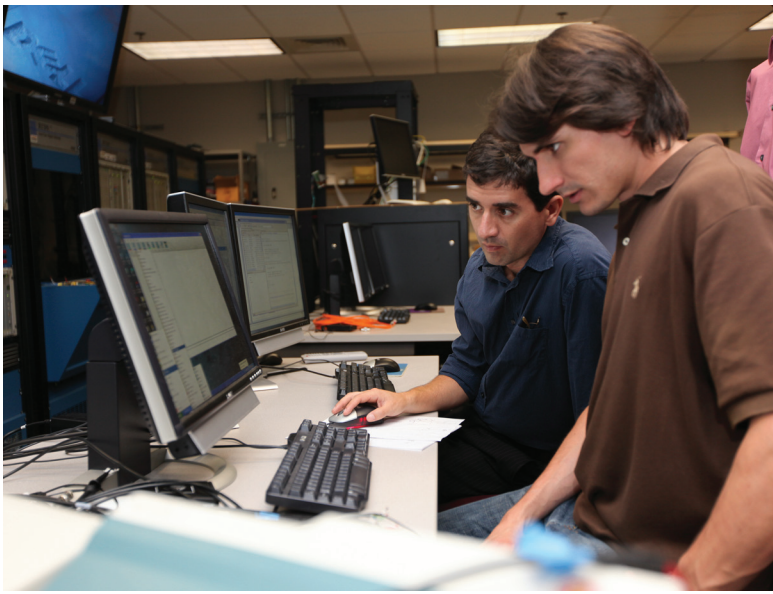
Endowed Gifts. The basic plan underlying an endowed fund is simple—the principal of the fund is never spent. The principal is invested, and the earnings are used to fulfill the purpose(s) for which the fund was created. Funds may be created for scholarships, fellowships, lectureships, research, professorships, library acquisitions, academic chairs, scientific and technical equipment, capital improvements, or any other educational purpose of the College of Engineering. Donors may use either outright or deferred gifts to establish endowed funds. Endowments can be established in the donor's name, the name of their business, or in honor of someone important to the donor.

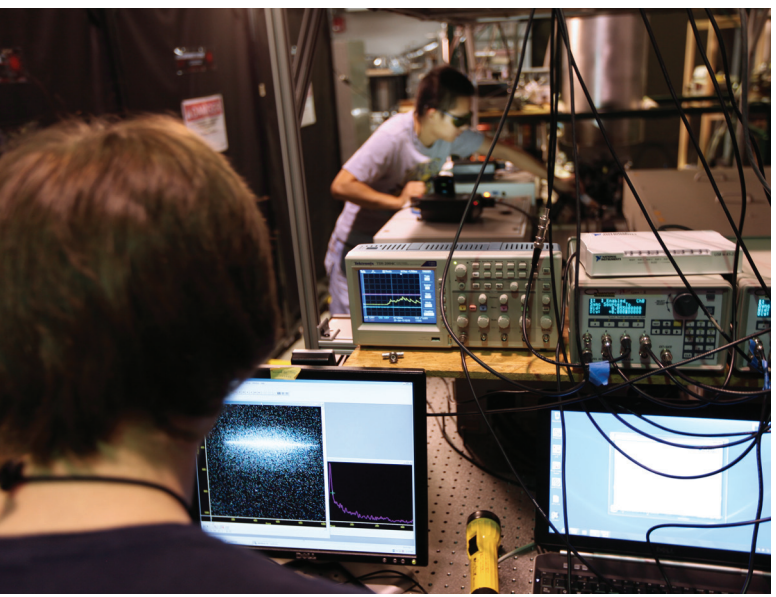
Planned Gifts. Planned gifts cover a wide range of options – from including the College or the department as a beneficiary in your will or your retirement account to creating a trust or charitable gift annuity – to just name a few. A planned gift enables donors to assist the College in its long-term mission of student learning, innovative research, and community engagement while helping to reduce a donor's burden of income, capital gains or estate taxes.

If you would like more information on giving to the College of Engineering and the ME department, please call (850) 410-6570, or you can donate online at: *www.eng.fsu.edu/me/about_us/giving.html*

The Florida A&M University Foundation and the FSU Foundation are 501(c) (3) charitable organizations and gifts made to them are tax deductible to the extent allowed by the law.








SPALDING

Join us on the journey...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