Message from the Chair

Winning teams need to continue to work hard and "get better." This is how I view our department. The question is in what areas should we focus our improvement efforts? Recently I attended the 2014 ASME (American Society of Mechanical Engineers) International Mechanical Engineering Education Leadership Summit. One of the topics presented involved MOOCs (Massively Open Online Classes) which include online education and "flipped classrooms" (i.e., having students watch videotaped lectures asynchronously outside the classroom and devoting classroom time to problem solving and "just-in-time" lectures). I am committed to finding ways in which to incorporate MOOC-related technology in our department. A searchable platform, entitled Open ME (more about this later in this newsletter) is being developed to supplement classroom instruction. Our faculty have begun to use the "flipped classroom" model in some upper level courses. We intend to continue working to enhance the efficiency of educational delivery in order to find what works best for our students.

Cultivating and Leveraging Student Innovation. Undergraduate students are potential innovators and their innovative "juices" need to be revived. Innovation is the first step to entrepreneurship. As a department we will look for ways to work in conjunction with programs being established by the newly hired College of Engineering Entrepreneur-in-Residence." Our capstone senior design class is an existing avenue for enabling our undergraduates to exercise innovation and entrepreneurship. We look to strengthen this course by assigning a leader with substantial real world experience who is able to manage the numerous multidisciplinary and multi-cultural projects.

Global Collaborations. Our collaborations to date have been with universities in Brazil, China, and Sweden. These collaborative programs help to prepare our students for future cross-cultural projects, increasingly common in engineering practice. Another benefit of these type programs is the much needed revenue they can bring to the department. Advanced and additive manufacturing. Spurred by the current emphasis on this topic by the U.S. President and political or industrial leaders, Dr. Cheryl Xu, who specializes in manufacturing was recently added to our faculty. Mechanical Engineering departments throughout the country have experienced explosive growth in the last several years, exceeding the growth of any other core engineering discipline. Mechanical engineering may be seen as "the new liberal arts curriculum", and it's graduates the "stem cells" of engineering, as the broad training received enables them to more readily morph into various engineering roles.

All of this is good, though it strains our faculty, staff and financial resources. We continue to work to find resources to maintain the quality of our program. Please be ready to do your part.

Breakthrough Process of Bi-2212 Filament

MagLab researchers have invented a groundbreaking new way to process Bi-2212 - one that makes it far more useful for building high-powered magnets including very high-field NMR (nuclear magnetic resonance) magnets, a Muon Accelerator at Fermilab or a new upgrade for the powerful Large Hadron Collider at CERN (European Organization for Nuclear Research). High density Bi-2212 filament macrostructure produced by the over-pressure (OP) technique developed at the Applied Superconductivity Center. Bi-2212 is a complex high-temperature superconducting material made of bismuth, strontium, calcium, copper, and oxygen that is well known to superconduct (or transmit electricity without loss) at super-cold temperatures up to 90 degrees Kelvin (or negative 183 degrees Celsius). Since most superconductors are used to make magnets, what matters even more than the temperature at which they become superconducting, is the density of supercurrent (supercurrent flows without resistance and thus generates no heat or electrical loss) that can flow though wires made of the material. By employing the MagLab’s new, pioneering process, magnetic engineers can make Bi-2212 into round wires instead of the previously limited wide “fettuccini” ribbons to build magnets. Now one can choose skinny “spaghetti” wires which are much more feasible for high-current cables and complex winding shapes.

(Continued on page 2)
Advancement in ME Research at FAMU-FSU COE

“This is the first time that any high-temperature superconductor has been made in the form that is the most useful for creating high-field magnets a form that is round, multifilament, twisted and capable of being made in multiple architectures and sizes without giving up the high-current density that is needed for making powerful magnets,” said David Larbalestier, Director of the Applied Superconductor Center, Mechanical Engineering professor and the lead investigator on the journal article.

“We have figured out a way to increase the critical current density by almost a factor of 10.” That means the newly processed MagLab bisco “spaghetti” can also carry far more electricity than its “fettuccini” predecessor. The breakthrough in processing came through very careful study of the complex microstructure of the wires and correlation to the supercurrent density. The key breakthrough was to discover that current was not primarily being blocked by grain boundaries, but rather by internally generated gas, which was blowing the filaments apart. The way to remove residual porosity and to make the filaments fully dense is to react the wire into the superconducting state under 50-100 atmosphere pressure, greatly increasing the connectivity and supercurrent density. A small insert coil of Bi-2212 wire treated in this way generated 3 T in the 31 T Bitter coil at the MagLab.

“We want to see this process used,” Larbalestier said. “We want to build lots of magnets out of Bi-2212, get the wire cast down, useable lengths way up and make Bi-2212 the precursor of new generations of round, twisted, multifilament, high-temperature superconductor wires that will revolutionize superconducting applications.”

Cutting edge Poly-sonic Wind Tunnel

Florida State University will now be a major national and international research site for groundbreaking aerospace technologies and next generation space vehicles. The Florida State headquartered Florida Center for Advanced Aero-Propulsion (FCAAP) unveiled a new state-of-the-art polysonic wind tunnel that will allow some of the world’s leading scientists and engineers to conduct innovative aviation and aerospace experiments at speeds as fast as Mach 5.

“You would be hard pressed to find a research center anywhere in the country that houses both the expertise and the equipment that we have access to,” said Farrukh Alvi, Director of FCAAP. “It is a facility that has been specially designed to help aerospace and aviation leaders test concepts and solve problems, while also educating and training the engineers who will shape the future of air and space travel.”

Companies were lining up to work with the center even before the wind tunnel was completed. Three contracts are already inked for the wind tunnel, including one with M4 Engineering, a Long Beach, CA, company that contracts with NASA, the U.S. Air Force, Boeing, GE and Hitco, among others. The research with M4 will allow engineers to examine the flow field around an aircraft to ensure safe operation. The team will also work toward developing a tool to help the U.S. Air Force design and develop next generation aircraft.

The new wind tunnel, created through a $3.3 million grant from the National Science Foundation, has a test section 12 inches by 12 inches in size and can generate speeds ranging from Mach 0.2 to Mach 5. That’s roughly 152 miles per hour to 3,691 miles per hour. A plane traveling at Mach 5 could go from New York to London in about an hour. Alvi called the tunnel the “final piece of the puzzle” for FCAAP.

The new polysonic wind tunnel will just add more opportunities to the 244 grants the center has already accumulated equaling more than $45.9 million generating four start-up companies that created 289 jobs. This wind tunnel allows the facility to have a more updated technology than the older generation high-speed tunnels used by NASA, not to mention it will be much less costly to operate.

The creation of the tunnel also earned FCAAP a spot as the only university group in the Supersonic Tunnel Association International which is an international organization of research centers and aerospace operations.

The Legislature established FCAAP after the federal government decided to terminate the shuttle program. It charged the center, a joint project of FSU, UCF, UF and Embry Riddle Aeronautical University, to develop cutting edge technology in aerospace and aviation while also building a new generation of scientists from the state’s leading universities.

Melvin Kosanchick, manager of acoustics technology, noise, vibration and emissions engineering for Boeing, attended the unveiling of the new wind tunnel and said that he and his colleagues have been working with the center for the past several years. A main focus of the center’s research is to help build quieter and greener airplanes. “The areas where we can look to collaborate make sense from a business perspective,” Kosanchick said.
Elected Mechanical Engineering Fellow

Congratulations to Dr. Chiang Shih, professor in the Department of Mechanical Engineering, on his election to Fellow of ASME. Shih was informed of his election by notification letter October 2013. Thomas G. Loughlin, CAE and ASME Executive Director wrote to Shih, "You have the privilege of being one of only 3,224 Fellows out of 124,105 ASME current members. By continuing to honor our Members by elevating them to the grade of Fellow, we ensure ASME’s commitment to its vision "to be the essential resource for mechanical engineers and other technical professionals throughout the world for solutions that benefit humankind." The Fellow grade is truly a distinction among ASME members.”

Shih's outstanding accomplishments are listed in his fellow proposal citation: "Dr. Shih has made significant contributions in education, research and development at the FAMU-FSU College of Engineering during its formative years in terms of curriculum development, research advancement, and service to the community. He served as the Chair of the Department of Mechanical Engineering between 2002 and 2011 overseeing unprecedented growth of its educational program. As Chair, he was instrumental in the establishment of several research centers, including the Aero-propulsion, Mechatronics and Energy (AME) Center, of which he is currently the Director. Dr. Shih has received teaching and advising awards for his dedication to engineering education focused on holistic professional preparation for engineering graduates.”

Selected as Materials Research Society Fellow

Congratulations to Dr. David C. Larbalestier on his election to Materials Research Society (MRS) Fellow. Larbalestier is Florida State University’s Francis Eppes Professor of Superconducting Materials in the Department of Mechanical Engineering, director of the Applied Superconductivity Center (ASC), and chief materials scientist in the National High Magnetic Field Laboratory (NHMFL).

Selected as Materials Research Society Fellow

In the official MRS announcement to Larbalestier, Tia Benson Tolle, MRS President, wrote, "It gives me very great pleasure to inform you that you have been selected as a 2014 MRS Fellow. Allow me to extend to you my congratulations, and also those of the MRS Board of Directors, for this significant honor." Tolle went on to say, "The title of MRS Fellow honors those MRS members who are notable for their distinguished research accomplishments and their outstanding contributions to the advancement of materials research, worldwide. The maximum number of new Fellow appointments each year is limited to 0.2% of the current MRS membership. The distinction is thus highly selective." For many years David Larbalestier has been an extremely productive researcher and research leader in materials science and he has been an exemplary member of our department, remarked Dr. Emmanuel Collins, Chair, Mechanical Engineering, FAMU-FSU College of Engineering. "He is well deserving of this honor." MRS provides not just a US-centered society," said Larbalestier, "but a true world-centered professional organization for materials, as you can see by its leadership. It has been a great pleasure to be able to maintain a high level of activity at FSU and I very much appreciate the support that I have received here.”

AFOSR’s Young Investigator Research Program Grant

Congratulations to Dr. Kunihiko "Sam" Taira, Florida State University professor in mechanical engineering, who has received an Air Force Office of Scientific Research (AFOSR) grant to pursue his research in "Understanding the Fundamental Roles of Momentum and Vorticity Injections in Flow Control." The AFOSR will award approximately $15 million in grants to 40 scientists and engineers who submitted winning research proposals through the Air Force’s (YIP) Young Investigator Research Program. The YIP is open to scientists and engineers at research institutions across the United States who received Ph.D. or equivalent degrees in the last five years and show exceptional ability and promise for conducting basic research. The objective of this program is to foster creative basic research in science and engineering, enhance early career development of outstanding young investigators, and increase opportunities for the young investigators to recognize the Air Force mission and the related challenges in science and engineering. This year AFOSR received 192 proposals in response to the AFOSR broad agency announcement solicitation in major areas of interest to the Air Force. These areas include: aerospace, chemical and materials sciences; physics and electronics; and mathematics, information and life sciences. AFOSR officials select proposals based on the evaluation criteria listed in the broad agency announcement. Those selected will receive the grants over a three to five-year period.
Mechanical Engineering Student Receives Prestigious National Scholarships

Matthew Vedrin, a mechanical engineering major from Winter Park, FL, will use his Boren Undergraduate Scholarship to study Portuguese in Brazil. "I was chosen for the Boren Scholarship because of my interest in international relations and energy, and how they affect the national security of the United States, I want to understand how Brazilian culture ties to the development of that country’s energy policies and technologies. Brazil is known for its extensive use of bio-fuel from sugar cane, creating a transportation infrastructure capable of using both petroleum and biofuels."

In Brazil, Vedrin will work on his senior design project while taking engineering and language classes, all in Portuguese. The project is a joint effort between the Florida State University and the Federal University of Paraná (UFPR), which involves a microalgae photobioreactor that can be used to grow algae for bio-fuels.

Dr. Chiang Shih, a mechanical engineering professor in the Florida A&M University-FSU College of Engineering and Vedrin’s academic adviser, praised Vedrin as an exemplary student who excels academically while actively engaging in extracurricular activities. “His determination and technical competency in energy as well as international experience will prepare him well as a leader in these important fields."

FSU students; Joseph “Tony” Manning (International Relations Political Science) and Matthew Vedrin are two of 161 students to be selected this year as Boren Scholars, and two of six selected from Florida. In addition, Vedrin was selected to receive a Goldwater Scholarship based on a project he completed that dealt with thermoacoustics, the interaction of heat and sound. “I built a thermoacoustic engine and performed modeling and optimization of the engine using software created at Los Alamos National Laboratory” Vedrin said.

Juan Ordonez, an associate professor of mechanical engineering in the FAMU-FSU College of Engineering who helped supervise the thermoacoustic engine project said, “His initiative in seeking out undergraduate research, his unwavering dedication to academics and his commitment to expand the use and development of alternative and sustainable energy technologies suggest a strong potential to significantly impact the future of sustainable energy in the U.S. and the world.”

Vedrin is one of 272 students to be selected this year as a Goldwater Scholar, and one of five selected from Florida. The award aims to provide a continuing source of highly qualified scientists, mathematicians and engineers by awarding scholarships to college students who intend to pursue careers in these fields.

“Through his career and achievements, he will touch the lives of many in a very significant way.”

Boren Awards for International Study
borenawards.org/boren_scholarship

Barry Goldwater Scholarship and Excellence in Education Program
goldwater.scholarsapply.org

Engineering students exhibit automated underwater vehicle

Kyle Miller, a mechanical engineering undergrad, proudly reported, "The Robosub team had a very successful day at DIGITECH Exhibition. We got a lot of interest in our project and the whole team did an excellent job presenting our work. We won "Best in Show: Innovative Undergrad" project and were presented with a glass award for display."

A "DIGITECH Student Exhibit" is any form of current student work or student group project that demonstrates an innovative application of computing or technology in a student’s undergraduate or graduate studies. This past years exhibition was held March 29, 2013, at the William Johnston Bldg on the FSU main campus. According to the web page for DIGITECH 2013: “Exhibit 252 - FAMU-FSU RoboSub, the Florida A&M University-Florida State University College of Engineering aims to participate in the competition as part of a multidisciplinary senior design project consisting of mechanical and electrical engineering undergraduates." The student team was tasked with developing the physical body of the submarine as well as working with computer vision, control systems, microprocessors, and sensors to develop a complex mechatronic system.

The RoboSub competition is an annual international competition hosted by the Association for Unmanned Vehicle Systems International (AUVSI) in San Diego, CA. The goal of the competition is to construct and program a fully autonomous underwater vehicle capable of completing specified tasks.

Students participating in building the RoboSub underwater vehicle were working under the direction of Dr. Kamal Amin, Dr. Chiang Shih, Dr. Jonathan Clark, from the Department of Mechanical Engineering and Dr. Bruce Harvey and Dr. Michael Frank, from the Department of Electrical and Computer Engineering at the Florida A&M University-FSU College of Engineering.

This was the first year the College of Engineering sent a student-designed robot to run in the annual international RoboSub competition in San Diego.
The fellowship is administered by the IEEE Council on Superconductivity. IEEE awarded six graduate study fellowships in applied superconductivity in 2013: three in the United States (US) and three overseas.

**ME Alumni Awarded IEEE CSC Graduate Study Fellowship**

FAMU-FSU ME alumni Jeremy Weiss (BS ME '10) and Carlos (Charlie) Sanabria (BS ME '11) received the IEEE Council on Superconductivity Graduate Study Fellowship in Applied Superconductivity in July 2013. The fellowship recognizes their outstanding accomplishments in applied superconductivity. They are both currently PhD students in Materials Science and Engineering at FSU and active in the Applied Superconductivity Center, which is connected with the National High Magnetic Field Laboratory. Sanabria works with Prof. Larbalestier to understand degradation of the brittle superconducting Nb3Sn wire for high-field magnets for ITER. Weiss works with Prof. Hellstrom investigating new iron-based superconductors.

The fellowship is administered by the IEEE Council on Superconductivity. IEEE awarded six graduate study fellowships in applied superconductivity in 2013: three in the United States (US) and three overseas.

**Open ME: More than just a Database**

The Department of Mechanical Engineering at the FAMU-FSU College of Engineering has rolled out its own instructional course media application called Open ME, (http://www.eng.fsu.edu/open/) where users will find instructional course media in the form of videos, presentations, slides, classroom notes, and so much more. The Department’s goal is to provide a repository of engineering media through which users can search according to course name, topic, and tags. Dr. Emmanuel Collins, Chair and Professor for the department, remarked, “Open ME is the beginning of the Department’s version of a type of “Khan Academy” which is specialized to Mechanical Engineering topics in general and classes taught within the Mechanical Engineering curriculum at the college in particular.” To call Open ME a database is to completely underestimate its educational potential,” said Dr. Carl Moore, associate professor in the department and developer of the Open ME instructional media repository at the college. Moore continues, “for example, its simple design facilitates effortless content searches while providing advanced search tools to zero-in on instructional content. The ability of Open ME to host short Pencast PDFs and even full-length video lectures encourages our faculty to join the active learning revolution, where students learn through multimedia of every type.” The objective of Open ME in developing innovative practices for both instruction and learning is in line with Moore’s earlier efforts with FAMLEARNS, the FAMU Multimedia Learning Resource Management System that was created in 2009. According to Collins, “This website is an outgrowth of Dr. Moore’s FAMLEARNS project. We expect it to only get better with time and have a substantial impact on pedagogy in the Department.”
Students and Design

Engineering Design Project Day

The Executive Council of the College of Engineering proclaimed November 27, 2013 as “Engineering Design Project Day.” Engineering classes were suspended on this day. All engineering students were strongly encouraged to use the day to collaborate with teammates to finalize class or senior design projects. To facilitate this collaboration, all classes held at the College of Engineering on Wednesday, November 27th were to be suspended. A proclamation approved by the Council and signed by the council chair Dean Yaw Yeboah, stated that all undergraduate degree programs at the College are accredited by the Engineering Accreditation Commission of ABET, Inc. It also cites that ABET requires that all engineering students must have the ability to design and function on multidisciplinary teams. Dr. Reginald Perry, associate dean, noted that the Council understands the time demands placed on engineering students to complete class and/or senior design projects during the closing weeks of a semester. It is hoped that this day will give students an opportunity to meet face-to-face as a group to help finalize these assignments. Faculty members who normally teach a class on Wednesday, November 27 were encouraged to instead hold office hours during their regularly scheduled class time.

Senior Design Project Results 2013

WINNER: Team 11: NASA: RoboOps Best Overall Project (WINNER) AME session

COMPETITION OVERVIEW: The 2013 RASC-AL Robo-Ops competition took place at the Johnson Space Center Rock Yard in Houston, Texas in June 2013. Up to 8 selected teams went head to head in wirelessly controlling their robots to navigate simulated lunar and martian surfaces and to collect as many of the 30 rock samples strew across the course as possible in a 1 hour window. Teams were also required to engage the public in the progress of their rover development, and to promote interest in space exploration.

Chosen Best Overall Project at the department’s Senior Design Project review; Team 11 was able to join the seven other university teams selected to participate in the 2013 RASC-AL Robo-Ops competition.

First and second runners up

Team 19: Harmar: Design Mobility Lift for European Insider Applications Best Project (1st runner-up) AME session

The need to provide a solution for individuals in Europe who transport themselves in smaller vehicles provided for the task to design a lightweight inside lift to compete in the European Market. “Harmaran innovation and design is dedicated to helping individuals enhance their mobility, independence, and quality of life. Their solutions are built to offer the highest quality, reliability, and value.”

Team 7: FIPSE-2/Vargas: Microalgae Photobioreactor Best Project (1st runner-up) HPMI session

The Goal for this years project was to develop a small-scale photobioreactor as a test bench for future research at FAMU-FSU College of Engineering. A small suite of prototyping sensors was developed in conjunction with the photobioreactor in order to monitor: Algae Concentration, Mass Flow Rate and CO2 Concentration.

Team 17: Engineering To Go: DTG Printer Cleaning Station Best Project (2nd runner-up) AME session

College are accredited by the Engineering Accreditation Commission of ABET, Inc. It also cites that ABET requires that all engineering students must have the ability to design and function on multidisciplinary teams. Dr. Reginald Perry, associate dean, noted that the Council understands the time demands placed on engineering students to complete class and/or senior design projects during the closing weeks of a semester. It is hoped that this day will give students an opportunity to meet face-to-face as a group to help finalize these assignments. Faculty members who normally teach a class on Wednesday, November 27 were encouraged to instead hold office hours during their regularly scheduled class time.

Second place

Team 21: NEEC: Autonomous Robosub Best Overall Project (Second Place) HPMI session

This Senior Design Project was to design and building an Autonomous Underwater Vehicle to compete in AUUVS Foundation and ONR’s 16th International RoboSub Competition. Students experienced the difficulties faced in trying to create an autonomous system, along with the challenges faced when moving a project from the design phase to the build and testing phases. The competition was held at the TRANSDEC Anechoic Pool in San Diego, California on July 2013. The competition required the Autonomous Underwater Vehicle (AUV) to do several tasks underwater while being uncontrolled by the team. These tasks included passing through a colored gate, following a line, ramming a certain color buoy, shooting torpedoes at targets, dropping mark-

Honorable mentions

Team 2: Eglin/AFRL: Tracking Projectiles in Optically Opaque Media Honorable Mention HPMI session

Team 4: Cummins: Bicycle Power Meter Honorable Mention AME session

Team 12: Prone Region Honorable Mention HPMI session

Team 18: AIAA: Can Satellite Competition Honorable Mention HPMI session

For more information on this project, go to this link of their blog: http://coerobosub.wordpress.com/author/coerobosub/
American Society of Mechanical Engineers

Everyone has been working hard to complete the design. Two teams for the student design competition both with completed prototype designs of their hexacopters are currently building and testing their designs for the upcoming competition held at the ASME conference at the end of this month. The technical presentations and posters will also be tested in front of a live audience (our general body) for the most preparation possible.

Along with all of the hard work the club found time to have some fun too. ASME participated in intramural sports last semester, specifically Battleship in which teams are given a canoe, water guns, trash lids, and buckets, placed in a pool, and then told to sink the others. Although we didn’t win, we plan on entering future intramurals. ASME also hosted a reverse engineering barbecue where they took apart two printers, a chainsaw, and a weed eater after consuming burgers, potato salad, and many delicious desserts.

Just before our big design competition is a fundraising event called Seminole Shack Showdown. ASME members are teaming up with members from Society of Women Engineers (SWE) to build a shack and live on campus in it for three nights to try to raise the most money possible for Habitat for Humanity. Just after the conference, the club will be participating in Relay for Life, where the president Justin Houdeshell has joined together different engineering clubs to create Engineers for Life to help raise money for those affected by cancer. If you’d like to join the club, just check out one of their meetings held every other Wednesday at 7:00 pm. Or visit the website for information and contact information: eng.fsu.edu/asme

Society of Automotive Engineers

The FAMU-FSU Society of Automotive Engineers is an organization comprised of students in different majors and engineering disciplines who share a passion for automotive design and construction.

Each year the chapter competes in the Baja SAE Collegiate Engineering Design Series. In this competition students are tasked with designing and building a rugged off-road vehicle capable of surviving severe punishment over grueling terrains. Participating in Baja SAE provides students the opportunity to gain valuable real world experience while competing head-to-head with some of the top engineering programs from around the world.

Joining the team requires no previous experience, and no new members are turned away. Our organization takes great pride in the fact that through active participation students learn valuable applicable skills such as mill and lathe work, welding, material selection, solid modeling, team work, and leadership.

Last summer members of the club traveled to RIT in Rochester, NY for competition, where the vehicle finished 75th overall and tied for 61st in the endurance race. While having fallen short of meet some goals, primarily due to some atrocious errors in clerical work, it was a testament to the team’s ingenuity that they were able to pass technical inspection, complete the race (which is designed to permanently destroy vehicles), and bring home a running, drivable vehicle which club members are still able to enjoy.

This summer, June 4 - 7, 2014 members will be traveling to Peoria, to compete in Baja SAE Illinois at CATERPILLAR headquarters. This year’s vehicle’s frame, composed of Chromoly Steel, is approximately half the weight of last year’s. The heavy boxed steel trailing arms of last year, have been replaced with refined tubular trailing arms with hubs built entirely in-house. The drive train in this year’s vehicle has been improved drastically to be cheaper, lighter, compact, and easily serviceable. The 2014 vehicle is expected to be capable of speeds of up to 40 mph which is 10 mph quicker than last year, while being approximately 150-200 lbs lighter.

Additionally the SAE team hosts welding days, Social BBQ’s (in which we take our vehicle out for some fun), weekend hikes to build a sense of camaraderie, and side projects. For more information email us at famu.fsu.sae@gmail.com
Another part to this trip was a visit to the UF REEF center auditorium to attend a lecture entitled “Inventing the Joint Strike Fighter” presented by Dr. Paul Bevilaqua, retired chief engineer of Lockheed Martin’s famed skunkworks. Dr. Bevilaqua is credited with creating the lift fan that is critical for the F-35B’s STOVL (short take-off vertical landing) capabilities. His lecture highlighted the challenges that engineers face when creating new technologies and politics collide.

After the lecture, the students went on to Eglin Air Force base to meet with the Marine Fighter Attack Training Squadron 501 and get a tour of the F-35 Joint Strike Fighter. The 501 was the first squadron to test the STOVL (short take-off and vertical landing) capabilities of the F-35 in October of last year. Inside the 501 headquarters the students first saw the F-35 life support systems. The Marines highlighted the pilots g -suits, harnesses, and communications equipment, but the main attraction was the F-35’s helmet. Each of these helmets is made of carbon fiber and is custom fit to each pilots head which cost between $400,000 and $600,000.

The students were then escorted into the hanger containing the F-35 which has one of the largest single engines ever placed in an aircraft. Unfortunately due to the highly classified nature of the F-35, the tour of the aircraft was limited, but any questions were answered by the Marines. There normally are flights where students can see the STOVL capabilities first hand, but the weather did not permit it. On the drive home members literally would not stop talking about the plane, so much in fact that when the road we were traveling down changed to an active runway we didn’t notice. Luckily that is normal on an air force base and we drove home without incident.

If AIAA sounds like something that may interest you, contact the President Justin Broomall at jcb08f@my.fsu.edu.