



Mechanical Engineering

Department Newsletter

University of New Hampshire, Durham NH

June 2016

Volume III, Issue II

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Nuts and Bolts Fundraising:

Please consider giving a tax
deductible donation to the
ME General Fund.

To donate, visit the CEPS
homepage at <https://giving.unh.edu/cepsme> and select
the Donate tab located on
the far right menu bar to
select an ME fund.

THANK YOU!

A Word From the Chair

Another academic year has gone by and what a year it was! We welcomed our first class of BS Ocean Engineering students who had wonderful experiences in the introductory course OE 400. Also, several ME undergraduate students, teams, and graduate students were recognized by the university and beyond for their accomplishments. See the list in the "Awards & News" section below. Congratulations and well done to all! Finally, the university received a \$5.3M gift from George Whelen IV to establish the John Olson (BSME '57) Advanced Manufacturing Center. Several of our faculty are involved in the Olson Center and look forward to the successful launch of this facility in the next year.

In this newsletter, there are alumni updates from all but one decade since the 1950s. Thanks to everyone for engaging with us! I know that the faculty and your classmates enjoy learning what you are up to and have accomplished over the years. Please keep sending us your Wildcat Tales.

Have a wonderful summer and we will see you again in the 2016-17 academic year! Cheers!

Brad Kinsey

Professor and Chair, Mechanical Engineering Department

Awards & News

ME Students were awarded 4 out of 9 university awards:

- Frederick Smyth Book Award: Mary Beth Sareault (Junior)
- Helen Duncan Jones Award: Brittany Marshall (Sophomore)
- Jere A. Chases Service Award: Sid Nigam (Senior)
- University Women's Award: Paige Balcom (Senior)

Michael Locke (Sophomore) received a Parents Association Award.



Paige Balcom (Senior) received a Fulbright to work in Uganda. She will defer her start date for graduate school at UC Berkeley for this opportunity.

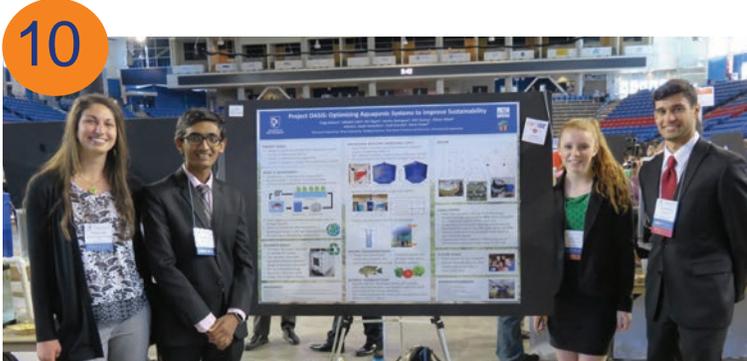
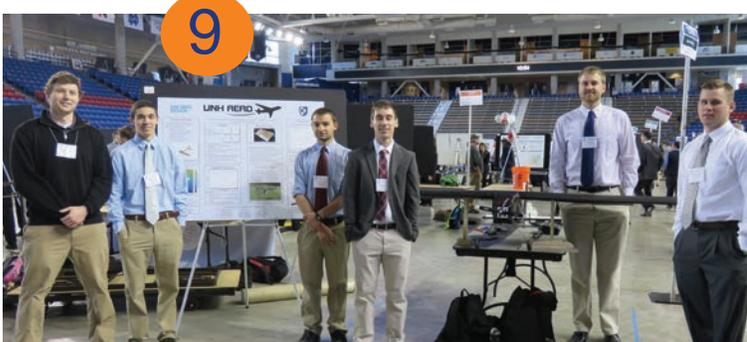
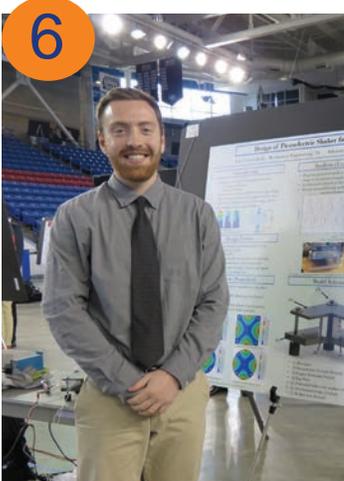
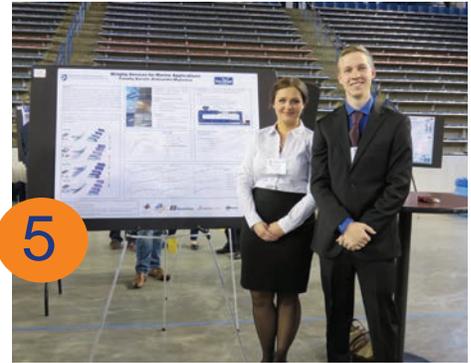
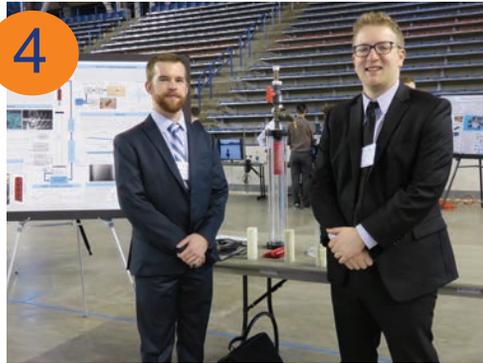
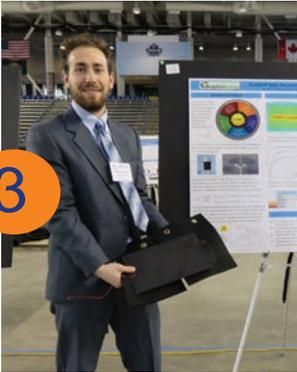
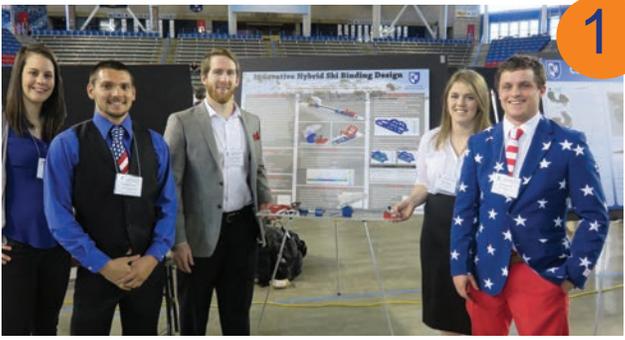
Joseph Collins (Senior) received the 2016 Undergraduate Research Conference Award of Excellence for his presentation at the URC Parents Association Undergraduate Research Symposium. Joe also received a Notre Dame Fellowship. See Wildcat Tales for story.

Autonomous Surface Vehicle (ASV) won 2nd place in the High Tech Division of the 2016 Charles and Miriam Nelson Poster Competition.

Drummond Biles (Grad Student, Advisor: Prof. Chris White) and John Turner (Grad Student, Advisor: Prof. Martin Wosnik) received a Summer TA Fellowship (STAF).

Miroslav Zecevic (Grad Student, Advisor: Prof. Marko Knezevic) has been selected to receive the G.T. Seaborg Institute Research Fellowship at Los Alamos National Laboratory.

Kateryna Miroshnichenko (Incoming grad student, Advisors Prof. Yaning Li and Prof. Igor Tsukrov) received the College of Engineering and Physical Sciences (CEPS) Fellowship.



URC - ISE Awards Photo Gallery

1. Innovative Hybrid Ski Binding won the ME Student Choice Award.
2. Fire Fighting Robot received an Honorable Mention in the ME Student Choice Award.
3. SunShot Solar Receiver R&D with Brayton Energy received an Honorable Mention in the URC ME Competition Teams group.
4. Methane Bubble Trap won the ME Faculty Choice Award.
5. Design of Wingtip Devices for Marine Applications received an Honorable mention in the URC Ocean Engineering group.
6. Design of Piezoelectric Shaker for Frequency Testing Applications won the URC ME Research group and also received an Honorable mention in the ME Faculty Choice Award.
7. Wave Energy Conversion Buoy received an Honorable mention in the Ocean Engineering ME Student Choice Award.
8. UNH Precision Racing Car #22 won the URC Mechanical Competition Teams group.
9. UNH Aerocats received an Honorable mention in the URC ME Competition Teams group.
10. Project OASIS won the URC in the Ocean Engineering group, and also won the Ocean Engineering ME Student Choice Award.

FACULTY & GRADUATE SPOTLIGHT

All About Manufacturing



Having grown up outside of Flint, Michigan, the one-time headquarters of General Motors Corporation, it is not surprising that Prof. Brad Kinsey has always been interested in manufacturing. Almost every relative and grown-up that he knew, including his father who was an electrician on a GM shop floor, worked in manufacturing. He notes, "manufacturing was just what people did for their livelihoods or else they supported the local manufacturing community in some way." After obtaining his BS degree in Mechanical Engineering from the University of Michigan, he too obtained a job in the automotive industry working for three years at a tier one supplier as a quality assurance engineer and a project manager. But he realized that his interest was in education and research so pursued his MS and

Ph.D. at Northwestern University. This is where his research focus on metal deformation processes started. The Mechanics, Materials, and Manufacturing Laboratory includes six faculty members and typically over 30 graduate, undergraduate, visiting scholar, and teachers during the summer. The vibrant group has attracted \$5 million in research funding over the past five years.

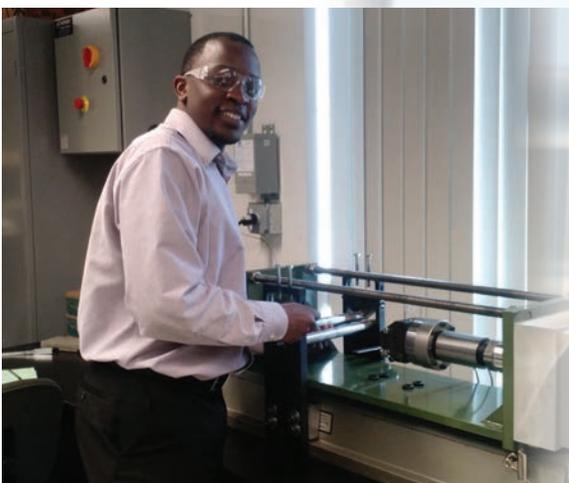
Prof. Kinsey is very excited by the emphasis on manufacturing at the federal level. In 2013, he served as the Department of Energy Representative to the Advanced Manufacturing National Program Office where he worked on the National Network for Manufacturing Innovation program. Now ten of these institutes (each supported at the level of >\$200M) have been or are in the process of

being established. At UNH, the focus on manufacturing includes the recent \$5.3M gift to establish the John Olson Advanced Manufacturing Center and \$500k of internal UNH support to establish the Center for Advanced Materials and Manufacturing Innovation.

Prof. Kinsey's awards include being named a Fellow of the American Society of Mechanical Engineers, a CAREER Award from US National Science Foundation, the Ralph R. Teetor Award from the Society of Automotive Engineers, and the UNH Assistant Professor of the Year Award. In his spare time, he likes to spend time with his family.



Forming the Future with Sheet Metal



Eddie preparing to insert a test specimen into the CBT machine.

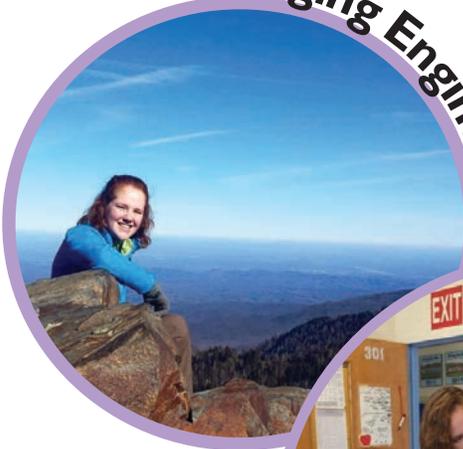
Background Image:
Metal specimens that have been tested.

Edward "Eddy" Momanyi is a first year Masters degree student working under Professors Yannis Korkolis and Brad Kinsey in the Mechanics, Materials, and Manufacturing (MMM) Laboratory. His thesis work involves the study of a relatively nascent technique in sheet metal forming known as Continuous-Bending-under-Tension (CBT). CBT is a modified form of the standard uniaxial tensile test in which, in addition to applying tension to the specimen, localized plastic bending is also imparted by having the metal specimen travel back and forth between three rollers. In this way, the localized onset of necking is delayed, and the high tensile strain which typically is only achieved in the failure location is experienced over the entire gage length. Thus, the elongation prior to fracture of the metal specimen is dramatically

increased. CBT allows more ductility out of metal to be obtained compared to the standard uniaxial test. This could have a significant impact in, e.g., the automotive industry which desires to use less ductile materials such as advanced high strength steels. Eddy received his undergraduate degree from Stanford University. However, he is not a stranger to UNH having grown up in Durham until the age of nine. His father, Richard Onyancha, now an Associate Professor at Rose Hulman Institute of Technology in Terre Haute, Indiana, received his Ph.D. under Prof. Kinsey in 2007. In addition to his research, Eddy is also a Teaching Assistant for ME 441 Introduction to Engineering Design and Solid Modeling. In his spare time, Eddy loves to watch and play soccer and is passionate about music and playing piano.

UNDERGRADUATE SPOTLIGHT

Bringing Engineering to the community!



Mary Beth Sareault is a junior Mechanical Engineering major with an interest in fluid dynamics and thermal systems. After graduation, Mary Beth will likely pursue an MS in engineering.

Last summer, Mary Beth interned with the Department of Defense at the Portsmouth Naval Shipyard. As a member of the test engineering department, she gained experience testing the hydraulic and air systems aboard the USS Scranton. This coming summer, she will be doing something a little different and working at the Philmont Scout Ranch in New Mexico. Mary Beth will be living in the backcountry and working as a Conservationist.

Mary Beth is actively involved on campus through multiple organizations. She is a member of Pi Mu Epsilon, Tau Beta Pi, co-director of the ULead team, and the public relations chair of ASME.

Mary Beth enjoys serving the community as a volunteer tour guide and a member of STEMbassadors. Teaching middle school students at both the Berlin and Newport STEMfests was an incredibly rewarding opportunity! Mary Beth was recently awarded the Frederick Smyth Book Award by the UNH Student Awards Committee.

Outside of college, Mary Beth has a passion for hiking and spontaneous adventures.

Bottom Photo: STEMfest in Berlin, NH
Photo Courtesy Brooks Payette

SENIOR PROJECT SPOTLIGHT

GE Aviation

The GE Aviation team was a new project this year, comprised of ME seniors Steve Burns and Chet Machamer. The purpose of this project was to find a suitable solution to streamline and automate an inspection process for sector seal slots on GE's new LEAP engine line. Stator sectors are located in the compression section of a jet engine, and lie between the compressor stages. Stators remain motionless, and increase the pressure in the engine while preventing the flow from spiraling. Seal slots have recently been added to the ends of each sector; however, slots holding these seals are extremely thin. This makes timely inspection difficult. Currently, the seal slots are measured with mechanical gauges and primarily by hand. For one sector, it takes about 20 minutes to measure the seals completely. The goal was achieved by testing multiple inspection machines commercially available, with the most ideal machine inspecting all seal slots on a part in less than 20 seconds. By being able to inspect these slots 60 times faster, it will greatly reduce the workload for the shop floor technicians and save a considerable amount of money.

For fun Steve likes hiking and rock climbing. He spent one summer working in Yellowstone and will be going to Yosemite this summer to do some big wall climbing. Chet likes to fly. During the summers he worked as a pilot in NH. After graduation he will be moving to Minneapolis and work as a pilot for Endeavor Air until he begins his Air Force pilot training.

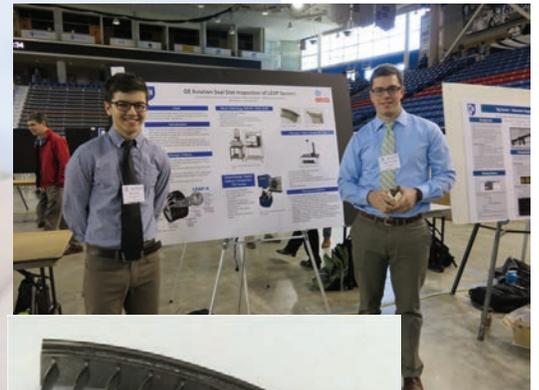


Figure 1: Stator Sector

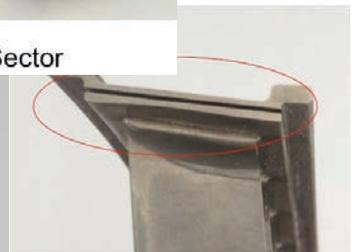


Figure 2: Seal Slot Detail
Mechanical Engineering

ALUMNI/COMPANY SPOTLIGHT

Harold Davis, B.S.M.E 1963



Harold's career has spanned many different projects and industries. He notes, "My UNH education made me very curious which has allowed me to do a variety of very interesting things. Nothing inspires me more than someone saying why would you want to do that or, even worse, that won't work."

It all started for Harold by climbing over generators at GE Large Steam Turbine with a bucket of soapy water looking for hydrogen leaks. Fortunately, for Harold this didn't last long and he was reassigned to the product planning department where he saw how decisions were made in a multi-million-dollar operation. Harold then worked on a small cryogenic refrigerator that would allow researchers to look at the basic atomic structure of materials close to temperatures around -455F – close to absolute zero. Next came cryogenic ultra high vacuum systems in the early days of thin film deposition. Part of Harold's extracurricular activities at this time was to experiment

with cryogenic food freezing by dropping chocolate cream pies into liquid nitrogen. This led to a patent on a food freezing system that he and a friend sold to a large company. Harold then moved to Wisconsin to work on a freeze crystallization process for desalination. Harold said "The impetus for this came from the energy crisis and the idea of bringing peace to the Middle East by making the deserts bloom. This work was done mostly under government contracts." This effort later moved to Massachusetts when a defense contractor took over the project.

Harold then started 2 small businesses. One failed and the other was successful. Harold said, "The first start up occurred when the defense contractor tired of the freeze crystallization project. A friend and I then took the technology and started a company to concentrate food, juices, coffee and paper mill black liquor by freeze crystallization." The government funded part of this research for the energy savings and some major companies also contributed because the resulting product did not have the burnt taste of evaporation. After eight years the company went out of business because we could not get one of the unit processes in a complex system to work properly.

Harold stated "After tiring of government contracts and employees, I started a company with just myself. Because of cost of the septic system for a house we were building, I set about trying to reduce the size of leach fields. I came up with THE CLEAN SOLUTION™ septic system that performs the biological functions of a leach field in a tank." After 4 years of development, the first system was sold in 1995. There are over 1500 systems in use in New Hampshire, Maine, Vermont and Massachusetts. These range in capacity from a single house to systems big enough for over 100 houses. Harold retired about three years ago and a former employee purchased the technology and is doing very well with the business.



Harold Davis (left) judging the Hybrid Ski Binding Project at the Undergraduate Research Conference in April with Ryan Bannon (right) answering questions from the judges.



Harold Davis receiving the College of Engineering and Physical Sciences (CEPS) Distinguished Alumni Award at the CEPS Scholarship Ceremony in 2015.

Harold is married to Dorothy, a wonderful woman who he started dating in high school. Their 60th wedding anniversary is coming up. Dorothy is a retired Director of Library and Media Services for our local school district. They have two children. Kate, who lives with her husband Brian in Seattle. Their son, Rob and his wife, Chris, live in New York City. Dorothy and Harold have 4 grandchildren with ages spanning from 11 to 30. Harold noted "In a career that extends from slide rules and rooms full of computers to tablets and the many programs that allow you to do things that we never thought were possible, I feel very fortunate to have been able to follow many of my dreams."

WILDCAT TALES

Joseph Collins, B.S.M.E. 2016

Joe will be attending Notre Dame next year for a PhD in Bioengineering at Notre Dame. After being awarded the Joseph Notebaert Premier Fellowship (the most prestigious doctoral fellowship offered by the university with 6 years guaranteed funding). Joe said "Thank you so much for all the continuous support over the past crazy year! It has meant a lot!"



Abigail Jenkins, B.S.M.E. 2013

Abigail lives in Seattle, and began working at Blue Origin in Kent, WA as an aerospace engineer in January, 2016. Abigail graduated from UW with a masters degree in Aeronautics and Astronautics in March, 2016. She also got an Australian Shepherd puppy this past December named Storm, pictured left.

James Popovitch, B.S.M.E. 2013

James has been taking classes for Brazilian Jiu Jitsu and Muay Thai Kickboxing at Chaos Martial Arts in Concord, NH. James said "It's an amazing program and I have learned quite a bit from my instructors. Jiu Jitsu is a groundwork based martial art (grappling, limb-locks, chokeholds, etc.) which yeah sounds pretty intense but it's a blast when working with such a great crew which Chaos has. I've taken to it very well and it is easily one of the best hobbies I've ever taken up." His last competition, James came in first place for Men's Lightweight Gi! James said "I was a two stripe white belt at the time (more or less the bottom of the totem pole, and I still am haha) but I managed to actually beat a blue belt (one belt color higher) for the first place slot! It was probably one of my proudest moments in my time training and I have a pretty sweet photo to boot of the victory decision."



Jeremy Seiferth, B.S.M.E. 2009

Chris Bickford and Jeremy started an automation company about two years ago and they have recently moved to a building in Portsmouth.

Fernando Vazquez, B.S.M.E. 2008

Fernando's 2nd daughter, Alina, pictured right was born on April 9th and is healthy and doing well.



Erin Ludwig Schroeder, B.S.M.E. 2004

Pictured left, Erin and her husband Matthew welcomed their second daughter Lucille "Lucy" Alison Schroeder on April 25, 2016. Mommy and baby are doing well and big sister Violet (2yrs) is warming up to the idea!!

WILDCAT TALES

Jerome Dubois, B.S.M.E. 1996

In July 2015 Jerome co-founded a new company focused on building automation and software solutions for ecommerce and retail warehouse operations. Based in Waltham, MA, 6 River Systems, Inc. just recently closed a round of financing that will ensure that our solution will make it to commercial launch in 2017. The team is moving incredibly fast, going from paper to working prototype in 3 months, completing our first beta customer within 8 months, and now engaging larger pilot installs in 2016. Jerome said "Building a new company has been an amazing and rewarding challenge. If anyone in the UNH ME department is interested in seeing what we're doing or joining the team, please do not hesitate to call!"

John Dolbow, B.S.M.E. 1995

John was elected to the Executive Council of the International Association for Computational Mechanics.

Brian Perry, B.S.M.E. 1985

Brian was a bit reserved in writing for the Mechanical Engineering newsletter since he has been outside of the applied profession for most of his career. He said "I did not want to distract from a profession I hold in high regard." After conversing with Professor Kinsey and Tracey from his office, he agreed to share his career choice and key aspects he has learned along the way.

His first job was with AT&T Submarine Systems in Newington, NH. This is where AT&T purchased underwater telecommunications and sonar systems from Simplex / Tyco just prior to being loaded aboard ships. It was interesting work being assigned as an ME in a predominantly EE universe, but it was the physical rigors of deploying state of the art systems in upwards to 8,000 meters of water that brought the two fields together. Brian said "The journey took me away from my home state and instead of a stint in Australia as promised, I spent the next four years working with Bell Labs in Holmdel, NJ (lesson 1 – large companies and the military do not always have the capacity to follow through on what may entice one to move). This is where I had the privilege of working with some of the world's premier scientists in the field; this is also where I received a career wake up call."

It was for Brian a bit humbling to work alongside scientists who managed not only their full time jobs at AT&T, but taught at nearby universities as well; in the Labs, an undergraduate degree is not table stakes but a prerequisite to getting a Masters or PhD. For those who may not be aware, Bell Labs has over a 90 year history of invention and innovation which includes: six Nobel prizes in physics, nine U.S. Medals of Science, seven U.S. Medals of Technology, two Draper Prizes and a Grammy award (yes a Grammy but in one of those technology categories the masses fast forward through).

Please see the [Mechanical Website](#) for full story.

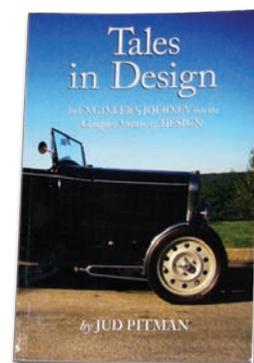
Jud Pitman, B.S.M.E. 1975

Jud Pitman wrote a book titled: *Tales in Design An ENGINEERS'S JOURNEY into the Complex Nature of DESIGN.*

Prescott Greene, B.S.M.E. 1957

Prescott is working at his "second career" as the director of DeBence Antique Music World, a small non-profit music museum. Part of my job is repairing and restoring music machines from as far back as 1850. Prescott said "We play them for our visitors, so keeping them operating is a lot of work."

You can see and hear them at www.debencemusicworld.com



Congratulations to the Class of 2016!

We would like to thank everyone for a great year!
The Mechanical Engineering Department wishes you a happy summer!



Photo Courtesy: Jennie Allen
Thank you to Jennie Allen for these great pictures!



This newsletter is in dedication in loving memory to:

Sara Lee "Dee" Browne

June 1935 - March 2016

She and her husband, Norris have been great benefactors to the Mechanical Engineering Department and the University.



 *Stay* 
CONNECTED

Professor Brad Kinsey
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Editor-in-chef

We would like to stay connected with our alumni and friends and would welcome newsletter contributions and suggestions.

Please send your news items, e.g. awards, promotions, personal updates, memories of UNH, and suggestions to Lauren Foxall at lauren.foxall@unh.edu

If you would like to make a financial contribution to the ME Department please go to: <https://giving.unh.edu/cepsme>

Check out full length stories and pictures on the Mechanical Engineering website: <http://ceps.unh.edu/mechanical-engineering/>

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