



Mechanical Engineering

Department Newsletter

WINTER 2017

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Nuts and Bolts Fundraising:

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THANK YOU!

A Message From The Chair

Yet another semester has flown by here at UNH! There are many advancements in the department that I will highlight here. We are currently searching for two new faculty members, one each in advanced manufacturing and ocean engineering. Please watch future newsletters for announcements related to these positions. Sadly, these positions partially came about due to retirements of Barbaros Celikkol and Ken Baldwin at the end of this academic year. We will miss these pioneers in our department and will be seeking ways to honor them for their decades of service. Also, we have several students who will be participating in co-op experiences this coming Spring and next Fall semester. A special thanks to Stephanie Whitney and Riannon Nute from the CEPS Career and Professional Success office for their hard work in helping to secure these exceptional opportunities for our students. As a last comment, we have several phenomenal student athletes (three of which are mentioned in the Awards and Notes) in our department. We are proud of their dedication (and time management skills) to excel both on and off the field. So as you can see, we have much to be excited about as this Fall semester comes to an end.

Happy holidays to you and your families and best wishes for 2018!

Brad Kinsey

Professor and Chair of Mechanical Engineering Department

Awards & News

- Professor Chris White's paper "Mechanics and prediction of turbulent drag reduction with polymer additives" was designated by the Thompson Reuters Essential Science Indicators as a Highly Cited paper in the field of Physics.
- Kyle Reisert (Senior) and Nick Marino (Graduate Student) were named to the 2017 Academic All -American Division I Football team, which honors top student-athletes nationally for their combined athletic and academic performance. This was the first time the UNH football had recipients since 1984.
- In continuing good academic/athletic news, Brittany Marshall (Senior) pictured right, was presented with America East's Elite 18 award, given to the student-athlete competing in the conference tournament with the highest cumulative grade point average.
- Audrey Balaska (Junior) has been selected to participate in the Engineering Innovation for Society Design Competition taking place in January in Troy, NY. The event is partnered with the Center for Disability Services in Albany, NY.



SENIOR PROJECTS

FOR ACADEMIC YEAR 2017-2018:

Below is a list of the Mechanical Engineering (ME 755) and Ocean Engineering (TECH 797) senior design projects for this academic year. We are excited that ten projects are building and/or futhering industrial partnerships.

Mark your calendar for the UNH Undergraduate Research Conference on April 18, 2018 where these projects will be displayed.

ME 755- Competition (C) and Industry (I) Projects	ME 755- Industry Cont. (I), Research (R), and Industry/Research (I & R) Projects	TECH 797- Ocean Competition (C), Research (R), Industry (I), and Other Projects
AEROCats- Regular (C)	Pratt and Whitney Cutting Tool Force Control (I)	Remotely Operated Vehicle (ROV) (C)
AEROCats- Advanced (C)	Sig Sauer Rifle Barrel Proofing Machine (I)	Aquaponics (R)
American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Challenge (C)	Symbotic Cleaning Robot for Automated Warehouse (I)	Autonomous Surface Vehicle (ASV) (R)
FSAE (C)	Timberland Midsole Design and Fabrication (I)	Climate Ready Coastal Infrastructure (R)
UNH LunaCats (C)	Drag on Cyclists (R)	LF Interferometric Sonar (R)
Mini Baja (C)	ET NavSwarm (R)	Living Bridge (R)
Students for the Exploration and Development of Space: SEDS (C)	High Speed Water Tunnel (HiCat) (R)	Submersible Aerial Vehicles (SAV) (R)
Heat Exchanger Experiment for Brayton Energy (I)	Pressure Gradient Insert for the Flow Physics Facility (FPF) Wind Tunnel (R)	Sustainable Surf Board (R)
GE Aviation: Blisk Defect Detection Automation (I)	Prosthetic Hand (R)	
Hutchinson: Non-Contact Measurement Machine (I)	QuadSat (R)	
Industrial Practices Using Time Sensitive Networks (I)	Ultra-Light Weight Cooling System/Payload POD (I & R)	
NHI Slurry Test Re-Design (I)		

UNDERGRADUATE & GRADUATE SPOTLIGHT

Lily Stewart, a junior in the Mechanical Engineering Program, completed a Portsmouth Naval Shipyard Internship as part of her SMART scholarship requirement. During the summer, she gained experience on engineering the Pressurized Rescue Module- a “mini” submersible that can rescue trapped sailors in a distressed submarine. After months of technical work documents, stress calculations, and correspondence with NAVSEA, Lily was invited to travel to San Diego with her department to assist in the fit check of a 3D printed electrical panel.

During the school year, Lily maintains a 4.0 GPA and is an active member of SWE, Pi Mu Epsilon, and Tau Beta Pi.



She plans on obtaining an accelerated master's degree before working at the Shipyard for her three-year commitment. Outside of school, Lily is an animal lover; competing with her horse during the summer in equestrian events. As well as racing sled dogs in the winter.



Ang Zhou is a PhD candidate working with Professor Joseph Klewicki. His dissertation work is focused on self-similarity and leading order balance structures in wall turbulence. Wall turbulence is responsible for drag on surfaces and dispersion of scalar and pollutants in a variety of practical applications. The research involves experimental measurement data in the turbulent boundary layer with hot-wire anemometry using the Flow Physics Facilities and multi-scale analyses of unclosed balance equations. One goal of his research is to compare the properties observed from three measures of self-similarity in flow structure to the self-similar behavior formally admitted by the mean dynamics in the inertial domain where the viscous force loses its effect. Another goal is to quantify the kinetic energy and scalar transport properties across different flow domains in wall turbulence. He tries to quantitatively establish scaling layer structure models of kinetic energy and scalar balances with the Reynolds number and Prandtl number dependent scaling behaviors of the balance layer thicknesses. His successful research has resulted in three peer-reviewed journal papers. In addition to research, he has also worked as a Teaching Assistant for fluid dynamics, thermodynamics and heat transfer classes. In his spare time, Ang likes watching soccer and tennis. His favorite club and star are Bayern Munchen and Rafael Nadal.

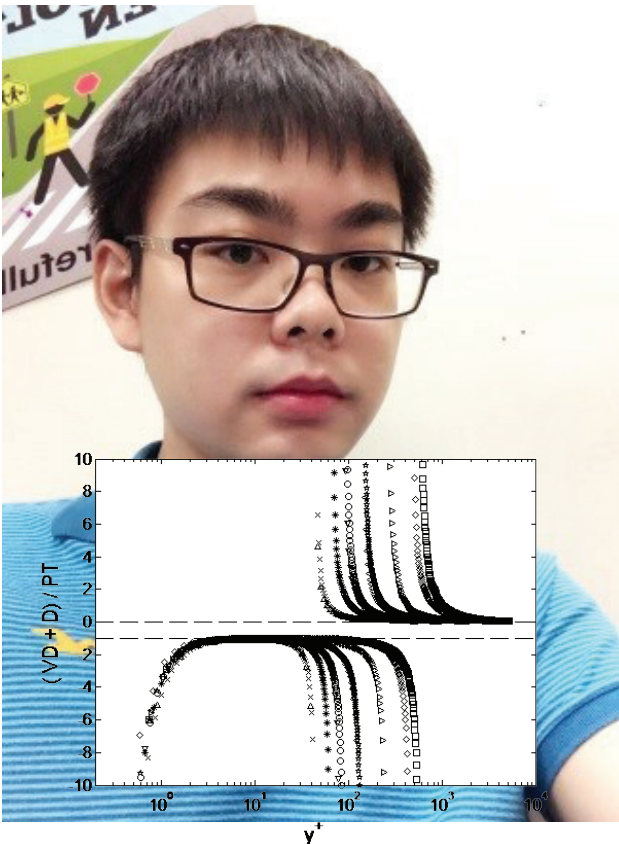


Image above is Leading order balance four-layer structure of the total kinetic energy budget for the turbulent channel/pipe flows.

FACULTY SPOTLIGHT



Prof. Joe Klewicki joined the ME Department in 2005. His main areas of research are experimental fluid dynamics, and especially the scaling and dynamics of turbulent shear flows that are bounded by a wall. Such flows are very commonplace in industrial and aerodynamic applications, as these turbulent boundary layer flows are responsible for

the frictional drag force experienced by streamlined bodies such as ships and aircraft. In pursuit of his research, Prof. Klewicki and his colleagues at UNH have developed a very large wind tunnel (called the Flow Physics Facility, FPF) that has unique capabilities regarding the study of turbulent boundary layers in the parameter regimes of greatest technological interest. Apart from

turbulent boundary layer flows, the FPF is also well-suited for human scale aerodynamics. In this regard, last year Prof. Klewicki enjoyed advising his son, Chase (B.S.M.E. 2017) on an FPF based project supported by Nike that aimed to reduce the aerodynamic drag experienced by long distance runners. Prof. Klewicki enjoys hiking, biking and playing golf with his wife Cindy, and when they go to the beach he likes to build sand castles.

WILDCAT TALES

Jason Bugeau-Medas, M.S.M.E. 2016

Jason and Corinne Bugeau-Medas adopted DeShaun, pictured right, on August 25th 2017. After fostering him for 2 years and 3 months, they welcomed DeShaun into their home when he was just 4 months old. DeShaun loves trucks, treats, and Daniel Tiger's Neighborhood.

Tugce Kasikci, M.S.M.E. 2010 and Stephen Lafaille, B.S.M.E 2009, M.S.M.E. 2011

After completing her Ph.D. at Northeastern University, Tugce started working at MathWorks and she is a content developer for Simulink. Tugce stated that her job includes building example models, assisting some of the customers on their models, and doing a bit of technical writing. She then stated, "It has been almost a year, and I enjoy it a lot." Tugce and Stephen got married in March and had a wedding ceremony in October at the Berkshires.

Drew Kiefaber, B.S.M.E. 1987, M.S.M.E 1989 and Kristen Buckley, B.S.M.E 1987

Drew and Kristin Buckley were married in 1991. They have two children aged 24 and 20. They live in Newmarket, where Kristin is a Physics and Math teacher. Drew stated that they are still active outdoors with running, biking, x-c skiing, hiking and paddleboarding. After graduation Drew worked at Heidelberg/Goss for 25 years developing mathematical models for printing presses and printing processes. For the past three years Drew has been working as a manufacturing engineer at a medical device manufacturer Vapotherm in Exeter. He works with UNH ME alums Josh Lent, Zack Archambault, and Jesse Bodwell.



DONOR SUPPORT

The Mechanical Engineering Faculty, Staff, Graduate Students, and Undergraduate Students deeply appreciate the support that we have received from our generous donors.

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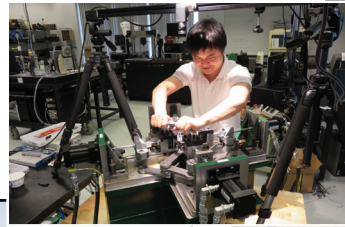
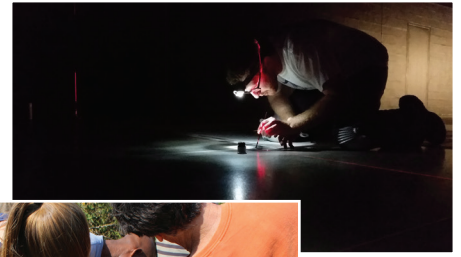
Thank you for your generosity!

Nuts & Bolts Fundraising

Please consider giving a tax deductible donation to the M.E. General Fund, which will support all senior design projects, or to one of two identified funds, Precision Racing and Lunabotics Teams. This will provide the teams the resources necessary to be successful without having to focus extensively on fundraising.

To donate, visit the CEPS homepage, and select the Donate tab located on the far right menu bar. From there you can select one of the three Mechanical Engineering funds (or others of interest, e.g., Engineers Without Borders, Society of Women Engineers, etc.).

Please help support our students and the Mechanical Engineering program for the future and beyond. Please contact [Mike McCarthy](#) for more information.



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Professor Brad Kinsey
Chair

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