

TRAILBLAZERS

ME faculty are leading engineers, teachers, mentors and researchers. Meet a few who are redefining the field through their innovative work and changing the world for the better in the process:



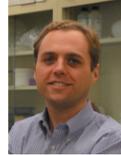
Jonathan Liu directs the Molecular Biophotonics Laboratory and researches biomedical optical devices and contrast agents for cancer diagnostics and therapy. He develops miniature handheld microscopes for real-time, noninvasive optical biopsy of living tissues, as well as spectral-imaging endoscopes for in vivo detection of biomarker-targeted nanoparticles.



Jonathan Posner researches fluid mechanics, micro/nanofluidics, colloids and electrochemistry. His current work focuses on developing nucleic acid based point-of-care diagnostics and other applications to clinical challenges in medicine, and the development of a user-centric, clean cookstove for the developing world.



J. Devin MacKenzie researches in the field of emerging electronic materials, including organic semiconductors, nanomaterials, photovoltaics, thin film batteries, printed and flexible electronics, wireless sensors and wearable electronics. He holds a joint appointment with materials science & engineering and the Clean Energy Institute.



Nathan Sniadecki researches in the areas of cell biomechanics, bioMEMs and bioinstrumentation. His lab is developing micro- and nano-scale tools to understand the mechanical properties of cells and the ways in which mechanics plays a role in tissue growth and cardiovascular disease.



Brian Polagye co-directs the Northwest National Marine Renewable Energy Center. His research explores sustainable electricity generated from marine resources, particularly tidal current and wave energy, the optimization of marine energy converters, and instrumentation to study their environmental effects.



Kat M. Steele's research focuses on improving mobility for individuals with movement disorders, such as stroke and cerebral palsy. Her current projects explore how 3-D printed orthoses can be optimized for each patient, whether motor control can predict surgical outcomes and using flexible electrodes to track and train muscle activity after stroke.

"The potential to create technology that will lead to a cleaner environment, improved health and a better standard of living for all is what makes mechanical engineering such a fascinating and rewarding profession."

Per Reinhall, Professor and Chair, UW Mechanical Engineering



EXTERNAL ADVISORY BOARD

Composed of distinguished alumni and friends, the ME External Advisory Board provides counsel to faculty, mentoring to students, volunteer leadership in experiential-learning programs, advocacy and vital connections to industry.

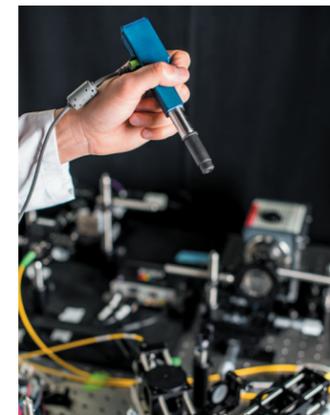
- **David Barr**, Director, Boeing Programs, Hexcel
- **Jon Bishay**, Bardy Diagnostics
- **Anders Brown**, '92 BS, '94 MS, President, Radius, Inc.
- **Steve Chisholm**, '86 BS, The Boeing Company
- **Stanley Gent**, President and CEO, Seattle Steam Company
- **Carl Hergart**, Director of Advanced Powertrain, PACCAR
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- **Tom Loutzenheiser**, '83 BS, Executive Vice President of Business Development, PRECO Electronics
- **Jill McCallum**, President, Pacific Rim Aerospace Corporation
- **Hamid Mortazavi**, '82 MS, '89 PhD, Research Specialist, SEMS Corporate Research Lab
- **Ron Prosser**, '70 BS, Chairman and CEO, Green Charge Networks

- **James M. Reichman**, PACCAR, Inc. (retired)
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- **Robert K. Schneider**, '71 BS, '73 MS, '76 MBA, President, D. Hittle & Associates, Inc.
- **K. Michael Sekins**, '81 PhD, Director of Applications, Innovations Department, Ultrasound Division Siemens Medical Solutions USA, Inc.
- **Fred Silverstein**, '72 MD, UW Clinical Professor of Medicine, Gastroenterology, and General Partner, Frazier & Co. (retired)
- **John T. Slattery**, Vice Dean for Research and Graduate Education, UW School of Medicine
- **Tim Stearns**, '90 BA, Senior Energy Policy Specialist, State Energy Office, Washington State Dept. of Commerce
- **Al Stephan**, '82 BS, CEO, Stratos Biosystems LLC
- **Tina Toburen**, '92 BS, '94 MS, T2E3 – Energy Efficiency Enterprises
- **Gil Wootten**, '89 BS, Accenture

UNIVERSITY of WASHINGTON

MECHANICAL ENGINEERING

Every day, the future is developed in our labs. From the development of devices for the early detection and treatment of cancer to development of alternative energy using nanotechnology, the faculty and students of the Department of Mechanical Engineering are doing their part to create a healthier, cleaner and more prosperous world.



OUR MISSION

LAUNCHING CAREERS

Educating tomorrow's leaders is our highest priority. We draw talented and creative students and offer a world-class education with an incredible breadth of skill and technological training. Our graduates are well equipped to succeed and to move through their careers as life-long learners. They are making a difference in diverse sectors such as biotechnology, health, environmental engineering, energy, transportation, manufacturing and information systems.

CROSSING BOUNDARIES

Our students and faculty work together in interdisciplinary, collaborative environments, forging partnerships across campus and with government agencies and industry partners. Our research has increasingly expanded in the areas of health technology and energy. This focus has allowed us to diversify our curriculum and move the department to the next level in national and international stature.

Through the Engineering Innovation in Health program, students work alongside engineering faculty and medical professionals to develop cost-effective solutions to today's pressing clinical challenges. The projects and deliverables are managed within a year-long design course sequence: fall quarter is dedicated to deepening an understanding of the clinical need and device design, winter and spring to prototyping and evaluation. We are preparing the next generation of students and faculty in medical device development and innovation while establishing an interdisciplinary culture of engineers and health practitioners.

In addition to health and medicine, the department has focused research programs in areas such as novel and automated manufacturing, clean and alternative energy, design for the environment, micro and nanotechnology, biomechanics, and advanced manufacturing and materials.

THE POWER OF INVENTION

Mechanical Engineering is a leading department at the University of Washington for patents and innovations. Bringing research to market through startup companies and licensing agreements benefits the state economy. Our expertise in such diverse areas as energy, manufacturing processes, robotics, nanotechnology and medical devices leads to revolutionary innovations that help address key societal challenges and improve lives.

DEGREE PROGRAMS

Bachelor of Science (BSME) – prepares students for diverse careers in engineering, industry or graduate work

Master of Science in Mechanical Engineering (MSME) prepares students for careers in research or industry, or further graduate study

Master of Science in Engineering (MSE) – an interdisciplinary program for those whose research crosses traditional areas of study

Doctor of Philosophy (PhD) – intensive research prepares students for advanced-level professional careers in academia and industry

FACULTY

COMPOSITION

- 38 tenured, tenure-track and research faculty
- 25 joint or adjunct faculty from other UW engineering, medicine and science departments
- 43 affiliate faculty representing industry and external research and educational institutions
- 16 postdoctoral research associates

ACHIEVEMENTS

- 10 National Science Foundation Presidential, Young Investigator and Early Career Award recipients
- 3 National Academy of Engineering members
- 3 Washington State Academy of Sciences members
- 3 UW Presidential Entrepreneurial Faculty Fellows



STUDENT DEMOGRAPHICS

For academic year 2015-2016:

Undergraduates enrolled: 338 | BSME degrees awarded: 138
Graduates enrolled: 271 | MSME/MSE degrees awarded: 64
Doctoral degrees awarded: 21

UNDERGRADUATE EDUCATION

PROGRAM FEATURES

- Fundamental coursework in mass and energy balances, fluid and solid mechanics, heat and mass transfer, dynamics and vibrations, biomechanics, acoustics, materials, design, controls and manufacturing.
- All students participate in laboratory courses and research or design projects.
- Teamwork, communication and problem-solving skills development, systems analysis, process and product design, prototyping and interdisciplinary projects.
- Concentrations available in mechatronics, nanoscience and molecular engineering, energy and engineering innovation in health.

EXCELLENCE

- 67 scholarships awarded by the department
- 3.59: Average cumulative GPA of incoming undergraduates
- 4 years: Average time to receive the BSME degree

GRADUATE EDUCATION

PROGRAM FEATURES

- Concentrations available in environmentally sensitive energy conversion, health systems and biotechnology, mechatronics, and advanced materials, structures and manufacturing.
- Thesis and dissertation research opportunities for leading-edge, interdisciplinary work.
- Research and teaching assistantships available to graduate students at all levels.
- Online professional and continuing education options available to integrate coursework with professional work.

EXCELLENCE

- 7 National Science Foundation Fellows
- 3 College of Engineering Dean's Fellows
- 1 Graduate Diversity Fellowship

CLUBS AND COMPETITIONS

ME students participate in award-winning student-led teams and challenges, including:

- EcoCAR
- Engineering Innovation in Health
- Formula SAE
- Human Powered Submarine
- Husky Robotics
- UW Hyperloop
- WOOF 3-D Print Club

RESEARCH AND INNOVATION

PROGRESSIVE TECHNOLOGIES

- Additive manufacturing and rapid prototyping
- Advanced composite materials
- Biotechnologies, biomechanics and human movement
- Clean, renewable and alternative energies
- Controls, robotics and system dynamics
- Electrochemical and microsystem engineering
- Fluids, microfluids, electrofluids and biofluids
- Innovation in health and biomedical device development
- Nanotechnology in advanced materials and sensors
- Photonics – imaging and display technologies

MARKET IMPACT

In 2015, Reuters ranked the University of Washington 4th among innovative global universities. ME is a leading department at the UW for innovation, commercialization and industry collaboration.

According to CoMotion, during 2012-2016:



319 PATENTS
FILED



240 REPORTED
INVENTIONS



113 PATENTS
ISSUED



11 STARTUP COMPANIES
RESULTING FROM FACULTY
AND STUDENT RESEARCH

Notable industry partners include:

- AG
- The Boeing Company
- Electroimpact
- Janicki Industries
- Nabtesco
- Origincell
- PACCAR
- Ricoh USA
- Siemens
- Toyota
- Umbra USA

PROGRAMS, CENTERS AND LABS

ME houses or partners with other UW units to facilitate more than 30 programs, centers and labs, including:

- **Boeing Advanced Research Center** pairs full-time Boeing engineers with students and professors to develop solutions for Boeing projects in the areas of automation, robotics and aircraft assembly.
- **Clean Cookstoves Lab** focuses on the testing, design and development of low-emissions, high-efficiency wood-burning cookstoves for the developing world.
- **Clean Energy Institute** is working to accelerate the adoption of a clean energy future by advancing solar energy and electrical energy storage materials, devices and systems, as well as their integration with the grid.
- **Engineering Innovation in Health** is a year-long program in which students partner with physicians and clinicians to design medical devices aimed toward lowering healthcare costs.
- **Human Ability and Innovation Lab** aims to empower human mobility through engineering and design by working closely with patients, clinicians and families.
- **Human Photonics Lab** advances the frontier of optical technology in the areas of human performance, cancer detection and treatment.
- **Northwest National Marine Renewable Energy Center** facilitates the commercialization of marine energy technology, informs regulatory and policy decisions and works to close gaps in scientific understanding.

