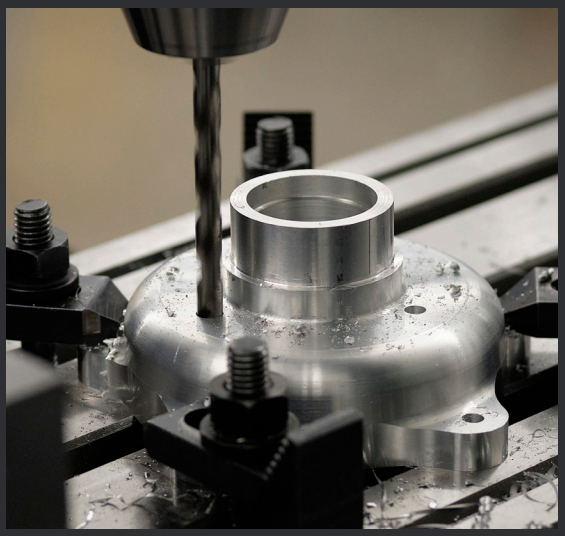

NORM ASBJORNSON COLLEGE *of* ENGINEERING

MONTANA STATE UNIVERSITY

BOZEMAN, MONTANA

The Norm Asbjornson College of Engineering is at the core of MSU's land-grant mission, providing an inclusive, hands-on learning environment that supports academic excellence, strives for innovation in research and serves the community in Montana and beyond.

Greetings from the Norm Asbjornson College of Engineering at Montana State University

I'm thrilled to share with you the exciting opportunities available to our students and faculty. In the pages that follow, you'll find them making groundbreaking discoveries and building impressive technologies. And you'll find them giving back, whether it's our students volunteering in their community or our college's namesake and mechanical engineering alumnus, with a generous gift of $50 million, making possible the construction of Norm Asbjornson Hall, which opened in 2019.

I invite you to explore the opportunities that await you at MSU and consider how you can be a part of our legacy of excellence and service.

Brett Gunnink, Ph.D., P.E.
Dean

College Highlights
Read more NACOE news at coe.montana.edu/news.

UNDERGRADUATE AREAS OF STUDY

- **Biological Engineering**
- **Biomedical Engineering**
- **Chemical Engineering**
- **Civil Engineering**
- Land Surveying
- **Computer Engineering**
- **Computer Science** (STEM interest)
- Interdisciplinary Option
- Professional Option
- **Computer Science** (Arts, Humanities or Business interest)
- **Construction Engineering Technology**
- **Electrical Engineering**
- **Environmental Engineering**
- **Financial Engineering**
- **Industrial & Mgmt. Systems Engineering**[1]
- Engineering Management
- **Mechanical Engineering**
- Aerospace
- Building Energy Systems
- Materials
- Mechatronics
- **Mechanical Engineering Technology**
- Military Air and Space Studies–Air Force ROTC
- Military Science–Army ROTC
- Military Studies

[1] Master of Science in Industrial & Management Engineering—one additional year

Major Option within a major
Minor Special program

GRADUATE DEGREES

- **M.Eng.** Bioengineering
- **M.Eng.** Chemical Engineering
- **M.Eng.** Electrical Engineering
- **M.Eng.** Mechanical Engineering
- **M.S.** Bioengineering
- **M.S.** Chemical Engineering
- **M.S.** Civil Engineering
- **M.S.** Computer Science
- **M.S.** Electrical Engineering, Plan A *(thesis)*
- **M.S.** Electrical Engineering, Plan B *(professional paper)*
- **M.S.** Environmental Engineering
- **M.S.** Industrial and Management Engineering
- **M.S.** Mechanical Engineering
- **M.S.** Optics and Photonics Plan A *(thesis)*
- **M.S.** Optics and Photonics, Plan B *(professional paper)*
- **Ph.D.** Chemical Engineering
- **Ph.D.** Computer Science
- **Ph.D.** Electrical Engineering
- **Ph.D.** Engineering—Options in Applied Mechanics, Civil, Environmental, Industrial, and Mechanical
- **Ph.D.** Materials Science

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FACTS & STATS

Research expenditures

$22 million

FY 2022

Number of faculty

TENURE TRACK	NON-TENURE TRACK
81	56

AY 2022

MSU is one of the nation's top producers of Goldwater Scholars

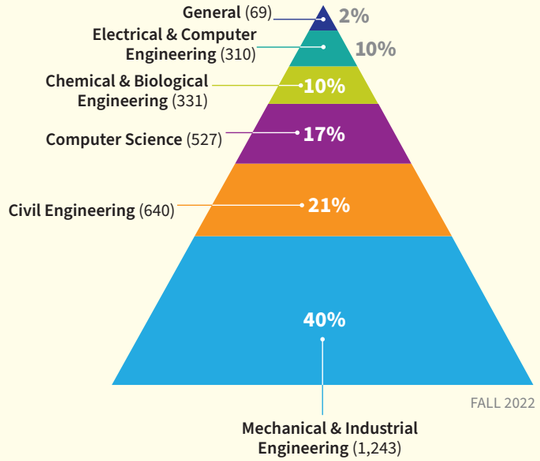
The Goldwater Scholarship is a competitive national award given to math, science and engineering students. MSU has produced 84 Goldwater Scholars—including 8 engineering students in the last five years. — 2022

Top U.S. Institutions for Goldwater Scholars

1 Harvard (107)
2 Princeton (101)
3 Stanford (99)
4 Duke (93)
University of Chicago (93)
5 University of Michigan (90)
6 Cal Tech (88)
7 Illinois Urbana-Champaign (85)
Penn State (85)
8 Montana State (84)
Johns Hopkins (84)
Washington Univ. St Louis (84)
9 MIT (83)
9 Yale (82)
10 University of Wisconsin (81)

UNDERGRADUATE ENGINEERING ENROLLMENT BY DEPARTMENT

Total enrollment: 3,588



FALL 2022

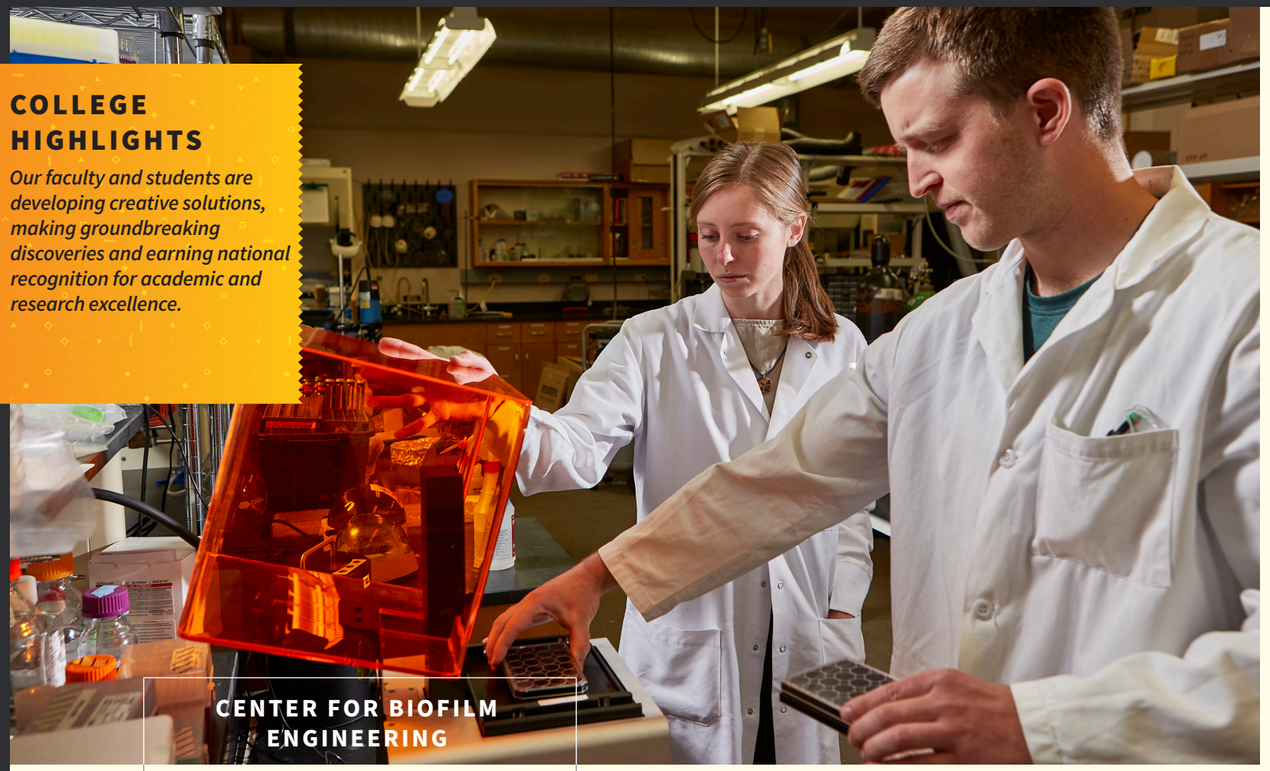
Norm Asbjornson Hall A $50 million gift from Norm Asbjornson made possible the 110,000-square-foot building, which opened in 2019. Its 17 labs and nine classrooms foster dynamic interdisciplinary engagement and meaningful student-faculty interaction.

Cutting-edge building technologies helped Norm Asbjornson Hall become **one of only 10 buildings in Montana** to be certified as LEED Platinum, the U.S. Green Building Council's highest certification.

Named for a generous donor and 1959 MSU electrical engineering alumnus, the **Bill Wurst Makerspace** includes specialty tools such as 3D printers for students and faculty to build, test and prototype their big ideas.

COLLEGE HIGHLIGHTS

Our faculty and students are developing creative solutions, making groundbreaking discoveries and earning national recognition for academic and research excellence.



CENTER FOR BIOFILM ENGINEERING

MSU researchers unveil 3D printing technology that could advance biofilm science

At the 2022 Montana Biofilm Meeting, graduate students Isaak Thornton and Kathryn Zimlich discussed their work to design and test a 3D printing device that can precisely lay out a grid of individual bacteria in hydrogel, constructing a rudimentary biofilm from scratch.

Rural Montana teachers experience MSU research in summer program

MSU's six-week Research Experience for Teachers program brought seven elementary teachers from around the state to campus during the summer of 2022 to work in research laboratories and develop hands-on lesson plans to take back to their classrooms.

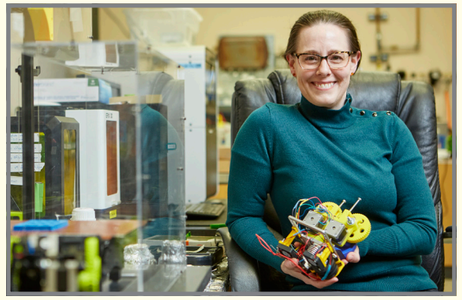
ELECTRICAL & COMPUTER ENGINEERING

In the latest chapter of the radiation-tolerant computer technology developed by MSU researcher Brock LaMeres, an advanced prototype is scheduled to fly to the moon for testing in 2023 as part of NASA's Artemis mission.

MECHANICAL & INDUSTRIAL ENGINEERING

MSU researcher wins prestigious 2022 NSF CAREER award

Cecily Ryan received the $700,000 grant for a new project to advance 3D printing so it could be used to produce a range of innovative materials that incorporate biological and biodegradable components, which could reduce the environmental impact of a variety durable goods.



CIVIL ENGINEERING

MSU research to help communities prepare for wildfire impacts to municipal water

Researcher Amanda Hohner is part of a $4 million transdisciplinary project led by the U.S. Forest Service to help communities better safeguard water resources against wildfires. Hohner's work focuses on studying what changes water managers could make to water treatment infrastructure.

CHEMICAL & BIOLOGICAL ENGINEERING

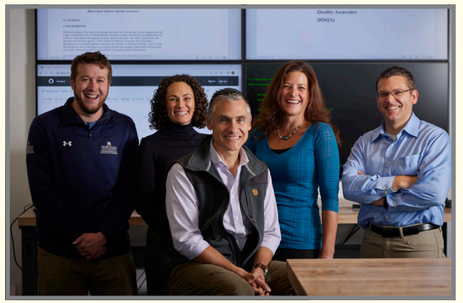
MSU researchers seek to optimize algae biomaterials production

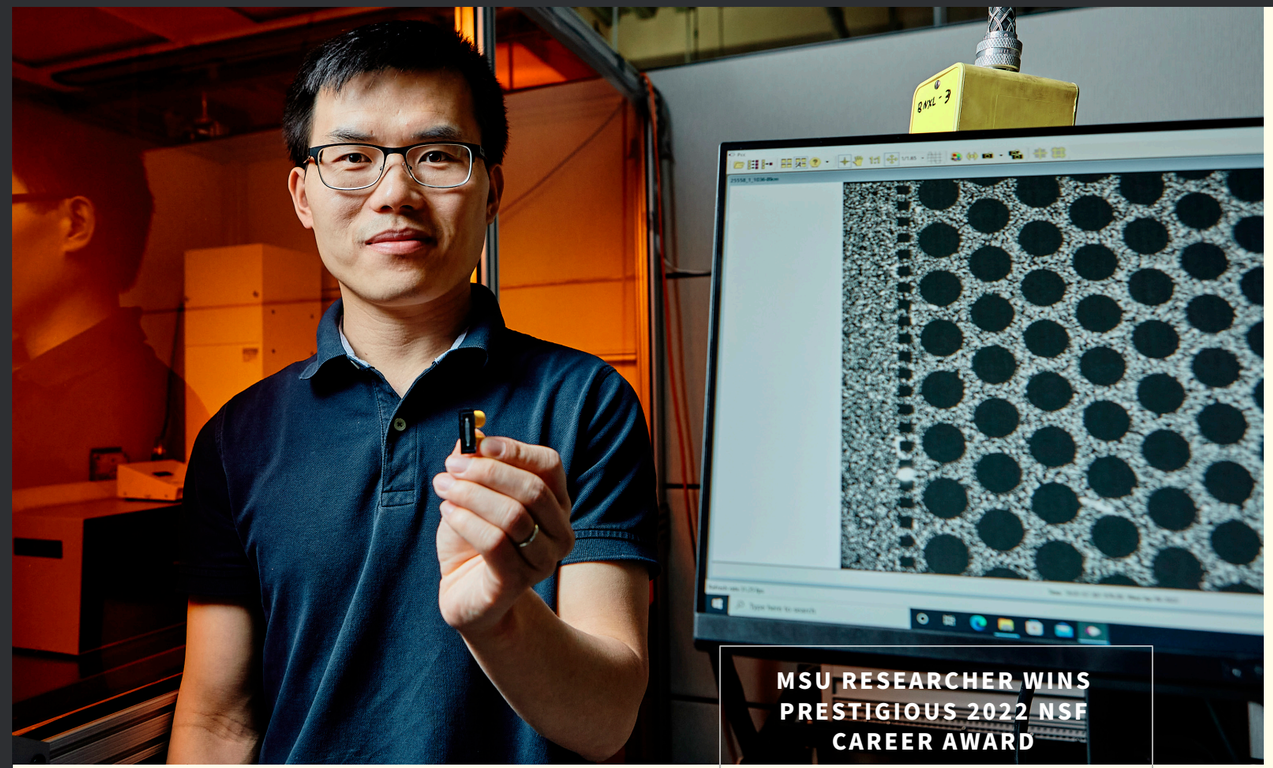
With a series of recently awarded grants totaling $6.4 million and building on more than a decade of MSU research on the topic, the researchers are exploring ways to optimize the use of algae for making biofuel and other products while removing carbon dioxide from the air.

COMPUTER SCIENCE

$5.6 million gift from Larry and Anne Hambly to enhance computer science opportunities

The donation establishes the Hambly Chair in Computer Science, an endowed professorship that bolsters expertise in rapidly growing areas like cybersecurity to enable groundbreaking research and expanded opportunities for graduates whose skills are increasingly in demand.





MSU RESEARCHER WINS PRESTIGIOUS 2022 NSF CAREER AWARD

Yaofa Li received the $600,000 grant to explore how the heat-dissipating effects of evaporation can be applied at a very small scale, by continually supplying small amounts of liquid onto specialized cooling membranes, to cool circuitry in advanced supercomputers.

MSU receives $3 million to support innovative graduate research on extreme microbes

The grant from the National Science Foundation enabled MSU to advance cutting-edge research while helping to pioneer a new model of graduate education designed to prepare scientists and engineers for a wide range of impactful careers.

MSU now offers Bachelor of Science degree in biomedical engineering

As medicine increasingly involves sophisticated technologies and an aging population creates more demand for health care, the new academic program prepares students for the rising opportunities to create new diagnostic devices, prosthetics, pharmaceuticals and more.

ELECTRICAL & COMPUTER ENGINEERING

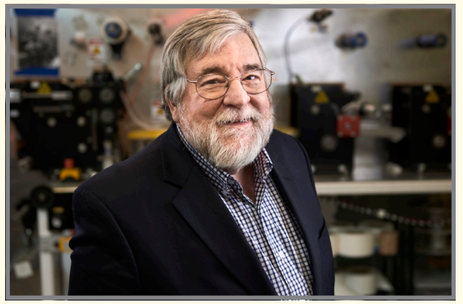
MSU graduate student wins prestigious NSF fellowship for optics research

Erica Venkatesulu received an NSF Graduate Research Fellowship, which provides funding for three years with a $34,000 annual living stipend plus $12,000 per year to cover tuition and fees, to allow her to focus on her work to advance a tool for measuring the composition of clouds.

MECHANICAL & INDUSTRIAL SCIENCE

MSU researchers pioneer new vcarbon fiber material

A team led by Doug Cairns has developed stretch-broken carbon fibers that are more easily formable to the complex shapes of aircraft and could significantly cut manufacturing costs. The project is funded by more than $25 million in contracts from the U.S. Army.



CHEMICAL & BIOLOGICAL ENGINEERING

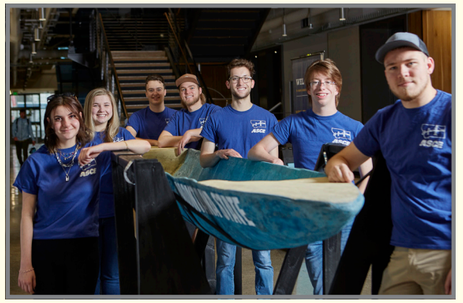
MSU professor awarded $450,000 NSF grant to improve bioplastics production

Researcher Stephanie Wettstein is leading a project to develop improved methods of making a bio-based plastic called PEF, similar to the PET plastic commonly used for food packaging, from sugars in biomass like that left over after harvesting oil seeds of camelina.

CIVIL ENGINEERING

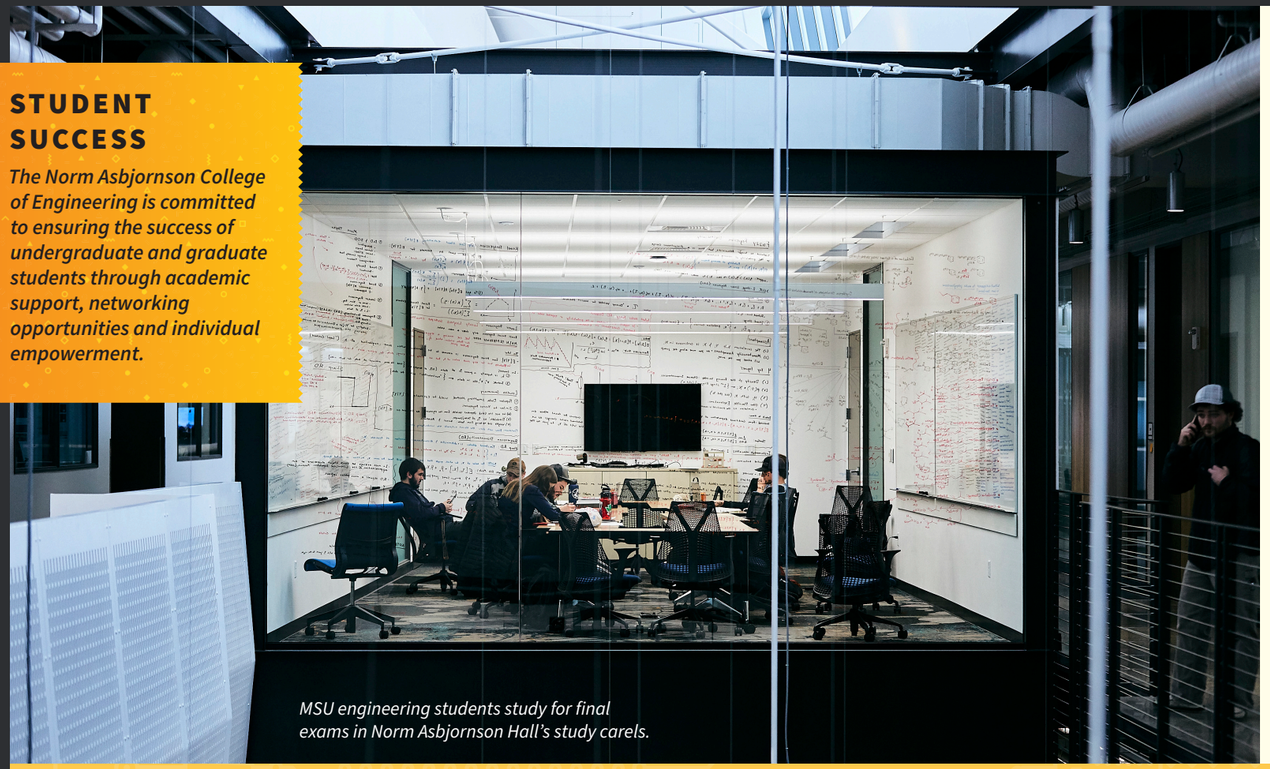
MSU students win regional competition with concrete canoe

Members of MSU's student chapter of the American Society of Civil Engineers paddled their 18-foot-long craft, made with specialized lightweight concrete, to first place at a regional tournament after countless hours designing and building it from scratch.



STUDENT SUCCESS

The Norm Asbjornson College of Engineering is committed to ensuring the success of undergraduate and graduate students through academic support, networking opportunities and individual empowerment.



MSU engineering students study for final exams in Norm Asbjornson Hall's study carels.

The Empower Student Center offers a study area, as well as access to resources, staff, and community. The center aims to support students academically and personally by fostering a supportive learning environment.

An inclusive college

We remain committed to providing a place for all to realize their potential in engineering and computer science.

The Empower program aims to advance our population of students from diverse backgrounds by fostering a supportive learning environment that encourages their academic, professional and leadership development.

Women students

255% increase in 15 years

660 women students

Fall 2022

Women faculty

27% of total

22 tenure-track female faculty

Fall 2022

ENGINEERING EXCELLENCE

Student support

ePALS
The student mentoring program pairs freshmen and sophomores with juniors and seniors who provide guidance about classes, activities, internships and more.

Empower
The Empower program supports historically underrepresented students in STEM fields. The Empower Student Center provides a study space and services that support inclusive community and academic success.

Women in Engineering
Offering professional development and networking opportunities, the Women in Engineering program works to build a community of successful women engineers and computer scientists.

Walk-in help centers
The engineering college offers walk-in help centers where students can get one-on-one help with challenging core courses.

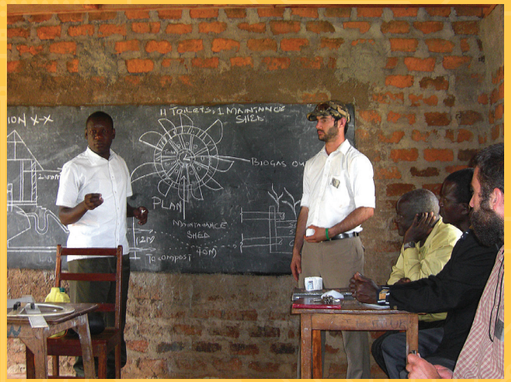
Global horizons
The International Engineering Certificate is a step towards becoming a global computer scientist or engineer – someone who can live, work and perform anywhere. Students work closely with their advisors to turn their engineering study abroad experience or service trip into credit toward the certificate.

Dedicated faculty
One-on-one faculty advising is available to all students for discussing course load, degree planning and career preparation.

Online Advising Center
We provide easy access for current and prospective students to connect with academic pathways, support resources and engagement opportunities.

Visit coe.montana.edu/advising to learn more

EMPOWERING STUDENTS



Engineers Without Borders

Engagement opportunities

Community and connections
Engineering and computer science students can join any of 38 clubs and organizations within the college, including the Bridger Solar Team and Association for Women in Computing.

Engineers Without Borders
MSU students have completed more than 30 projects in the Khwisero region of Kenya, including water well projects, sanitation projects, a water pipeline and rainwater catchment systems.

Construction competition
MSU civil engineering students regularly place among the top teams at a regional competition where they create mock construction bids on real-world projects such as bridges.

FACULTY SUPPORT

MSU faculty and staff enjoy professional development, extensive support and cross-discipline collaboration in the heart of the beautiful Greater Yellowstone Ecosystem.

FACULTY SUPPORT

- Guided by faculty interests and goals, and the values of innovation, collaboration, and partnerships, the **Center for Faculty Excellence** develops and provides experiences, opportunities, and resources that support the growth of faculty across all career stages in achieving excellence in teaching, including academic advising, research/scholarship, and service.

- MSU's **Research Cyberinfrastructure** program aims to provide MSU researchers with the cyber-infrastructure and support they need to remain on the cutting edge of their fields. Computing resources include the NSF-funded **Bridger High Performance Research Network** and the 22-teraflop **Hyalite Research Computing Cluster**, which is the largest super computer in Montana.

- MSU's Office of Sponsored Programs helps faculty connect with state, federal and private **funding sources for research**, and also provides general research guidance through principal investigator trainings and more.

- MSU's **Academic Technology and Outreach** helps faculty access online teaching tools and other educational technologies, supports outreach activities such as MSU Family Science Day, and provides opportunities for faculty to teach outside of the university.

- The annual **Provost's Distinguished Lecturer Series** recognizes outstanding MSU faculty for their scholarship and leadership. Faculty reflect on the inspirations for their work in lectures attended by the MSU community and the public.

- At a ceremony each spring, the Norm Asbjornson College of Engineering **honors exceptional faculty and staff** for their contributions in research, teaching, mentorship, outreach and more.

- The Norm Asbjornson College of Engineering supports faculty research and teaching with two grant programs. The **Thorson Excellence in Engineering Research** program, made possible by a $2.7 million endowment, awards multiple grants each year up to $25,000. The **Bryan Innovation Instructional Grant** program provides up to $9,500 for curriculum development.

- Our college has a culture of **work-life balance** in which faculty are supported while pursuing both their academic and personal goals.

CENTERS, LABS, AND OTHER AFFILIATED ENTITIES

Center for Biofilm Engineering
The CBE is the world's first, largest, and best-known biofilm research center.
Matthew Fields, Director
406-994-4770
cbeinfo@biofilm.montana.edu

Magnetic Resonance Laboratory
Offers a variety of tools for researching biofilms, gels, ice and more using MRI.
Sarah Codd and Joe Seymour, co-directors
406-994-1944
scodd@coe.montana.edu

Montana Engineering Education Research Center
Positions Montana as a national leader in engineering education research and transforming engineering education through collaborative, empirical research.
Brock LaMeres, Director
406-994-2505
lameres@montana.edu

Subzero Research Laboratory
A unique, internationally recognized, state-of-the-art suite of laboratories used to study snow, ice and the effects of the cold on projects across a range of scientific disciplines.
Kevin Hammonds, Director
406-994-2167
kevin.hammonds@montana.edu

Western Transportation Institute
A national leader in rural transportation research, the institute houses eight research centers with specialties in wildlife passage, infrastructure sustainability, public lands and more.
David Kack, Director
406-994-6114
wti@coe.montana.edu

Energy Research Institute
Enables the advancement of biofuels, wind energy, carbon sequestration, fuel cells and other energy technologies.
Lee Spangler, Director
406-994-1658
energy@montana.edu

Montana Nanotechnology Facility
One of only 16 centers that are part of the NSF's National Nanotechnology Coordinated Infrastructure framework providing access to nanotech research facilities and expertise.
David Dickensheets, Director
406-994-7874
davidd@ece.montana.edu

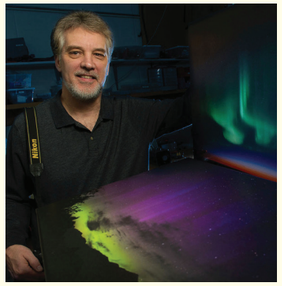
Optical Technology Center
A multidisciplinary center offering opportunities to find practical solutions to optics-related problems and discover new applications for optical technology.
Joseph Shaw, Director
406-994-7261
joseph.shaw@montana.edu

Thermal Biology Institute
Conducts and promotes research and education focused on the biology and interrelated physical and chemical processes of geothermal environments in the Greater Yellowstone Ecosystem.
Brent Peyton, Director
bpeyton@coe.montana.edu
406-994-7419

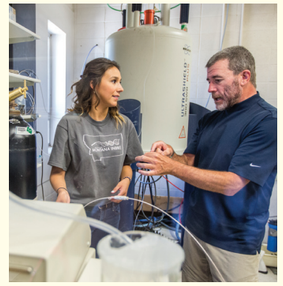
Montana Manufacturing Extension Center
Provides state-wide outreach and assistance to Montana's manufacturers, helping their businesses grow and innovate.
Paddy Fleming, Director
406-994-3812
pfleming@montana.edu

Center for Biofilm Engineering

Subzero Research Laboratory



Optical Technology Center



Magnetic Resonance Laboratory

MONTANA
STATE UNIVERSITY
NORM ASBJORNSON
College of
ENGINEERING

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