CAMPUS REPORT

DATE: April 11, 2016

TO: Board of Regents

FROM: Donald M. Blackketter, Chancellor, Montana Tech

RE: Campus Report for the May 2016 Board of Regents' Meeting

- Montana Tech student Molly Brockway, a junior majoring in Metallurgical and Materials Engineering, was awarded the Goldwater Scholarship by the Barry Goldwater Scholarship Foundation. After graduation, Brockway plans to pursue a PhD in Materials Science and Engineering and research in the field of biomaterials. "My strong background in materials engineering will allow me the tools to improve medical implants and their applications in living systems," noted Brockway, from Anchorage, Alaska.
- Montana Tech hosted the 38th Intercollegiate Mining Competition on April 1st & 2nd. The competition included 230 competitors from 40 student teams representing 14 universities across the country and internationally (Australia, Brazil, and the U.K.) Montana Tech was represented by two teams in each the Coed and Men's Divisions and placed 4th & 5th and 3rd & 6th respectfully. The Men's "Green" Team won the Track Stand event and the Coed "Green" Team won their Jackleg Drilling and Swede Sawing events. Both "Copper" teams were primarily new competitors and still managed to place well.

STUDENT ACHIEVEMENT

- Highlands College Construction Tech/ Carpentry students continue to provide community service/ service learning hours to numerous not-for-profit organizations in the Butte Silver Bow area. Students and instructors lend an average of 4 hours each day per person to The Spirit of Columbia Gardens Carousel project, National Affordable Housing Network and Habitat for Humanity build. This year's build is a single family residence and a American Disabilities Act (ADA) compliant 4-plex (5 unit build total), and excavation, footings and foundation walls for the future build-out of a new activities center (which was designed, drafted, planned and estimated by Highlands College students) for the Kiwanis Club Sunshine Camp which serves underprivileged children in Butte Silver Bow.
- Michael Powers, a Geological Engineering student, submitted a conference paper titled "Probabilistic Assessment of Tunneling induced Ground Settlements and Damages to Adjacent Buildings" which was accepted for the 6th Asian-Pacific Symposium on Structural Reliability and Its Applications to be held in Shanghai China in May 2016. Dr. Lei Wang of General Engineering Department is a co-author and advisor on this research.
- Maureen Chorney, a senior in Metallurgical and Materials Engineering, received two prestigious scholarships awards: a TMS Extraction and Processing Division (EPD) Scholarship and a Copper Club Academic Scholarship. Ms. Chorney received the TMS scholarship at the 2016 TMS Annual Meeting (Nashville, TN), where she also presented a poster, "Separation and Recovery of Rare Earth Elements using Ion Exchange," based on her undergraduate research funded by the Army National Laboratory.
- Grant Wallace, a first-year student in the Materials Science Ph.D. program, attended the 2016 TMS Annual Meeting to present a poster, "Synthesis of Nanocrystalline Tungsten Carbide (WC) via Carburization of WO42- on an Activated Carbon Matrix," based on his research funded by the Army National Laboratory.
- CAMP student employee Cole Carpenter, PE/ME, has been awarded the Student Leader Experience Award from the Society for Advanced Material Process Engineering (SAMPE). Cole is the first MT Tech recipient of this prestigious award. He will have an all-expense paid trip to the SAMPE Spring Technical Conference in May 2016 where he will participate in numerous events including the student poster session, student bridge building contest as well as presenting a paper at the conference. His paper will showcase the Summer Undergraduate Research Fellowship (SURF) work he completed with advisor Ronda Coguill, CAMP faculty, in the summer of 2015. His work studied the production and implementation of a fiberglass composite pipe insulator for use downhole.
- CAMP student employee Ryan Foley, M&ME, will be presenting a paper at the SAMPE Spring Technical Conference in May 2016. This paper showcases the Summer Undergraduate Research Fellowship (SURF) project he worked with advisor Ronda Coguill during the summer of 2015. The project studied the outcomes of adding minerals to standard 3-D printing filament to enhance its

performance. This work has been continued in the CAMP lab by student Lucas Reif, who is finishing the work within his Undergraduate Research Project. Lucas took the filament with additive mixture Ryan designed, then printed and characterized these samples. Lucas anticipates presenting his work at the fall CAMX symposium.

- The MT Tech SAMPE student chapter recently attended a composite materials business expo in Salt Lake City, UT. Students met with many of the sixty-five composite fabrication companies and learned about new composite fabrications techniques. The group of 8 students and advisor Ronda Coguill then toured the Rockwest and NAMMO Composite Solutions factories to view first-hand the fascinating world of composite material manufacturing.
- Highlands College Historic Preservation Technology and Construction technology students have
 partnered with Butte Silver-Bow county Public Works Department to investigate rehabilitation of the
 Historic Basin Creek Caretakers house at Basin Creek reservoir. After securing the site with fencing
 and "moth-balling" the structure to prevent future vandalism, students have estimated and identified
 historically accurate and best-practice techniques to re-build and replace window frames and sashes
 with insulated glass, researched methods for insulating existing weight pockets behind jambs, and
 proper sizing and sealing methods for storm windows. This window rehab method will be infrared and
 draft tested compared to windows of similar date and construction to measure energy efficiency, energy
 cost savings, and overall cost savings versus replacement with new windows. This project is the first of
 many research/applied application projects over the long term to rehabilitate the home for future use.
- Highlands College students studying gerontology and education and led by faculty member, Dr. Elyse Lovell, presented research at the Student Two-Year College Research Day in Helena on April 8th. The students' research involved interviewing seniors living in the independent/assisted living center, The Springs, to learn about the their lived experiences relating to change, ageism, limitations, discovery, reflections, and learning. Fourteen students conducted interviews and learned much from their senior interviewees in regard to the strength, wisdom, and determination necessary for healthy aging.

FACULTY EFFORTS

- Dr. Lei Wang, an assistant professor of general engineering, presented the paper "Extended Kalman Filter for the Inverse Analysis of a Supported Excavation Based on Field Monitoring Data for Improving Predictions of Ground Responses" in Geotechnical and Structural Engineering Congress 2016 held in Phoenix AZ in February 2016. The paper has also been included in the Proceeding of Geotechnical and Structural Engineering Congress 2016 published by the American Society of Civil Engineers (ASCE). The paper describes a new approach for inverse analysis of braced excavations using the monitoring data based on the extended Kalman Filter formulation. The developed approach has been demonstrated to be very effective in refining the predictions of the soil-wall-support system responses as well as the damage potential of adjacent buildings through a case study.
- Dr. Larry N. Smith, Associate Professor of Geological Engineering, was invited to spend January through April 2016 at Denmark Technical University, Centre for Nuclear Technologies, Risø Campus as a sabbatical researcher. He is conducting optically stimulated luminescence research on geologic samples from glacial Lake Missoula and Pleistocene and Holocene highstands of Owens Lake, California.
- Professional and Technical Communications faculty Dr. Glen Southergill presented as Associate Editor of K.B. Journal: The Journal of the Kenneth Burke Society at the editor's roundtable of the 2016 Research Network Forum at the Conference on College Composition and Communication and served as a discussion leader.
- Dr. Glen Southergill presented as an invited respondent to a session on the Kenneth Burke Digital Archives in the first Utah Symposium on the Digital Humanities hosted by Utah Valley University on February 26, 2016.
- Dr. Glen Southergill gave the first keynote address to Utah Valley University's newly formed chapter of the Rhetoric Society of America on February 25, 2016.
- Dr. Henrietta Shirk, Associate Professor of Professional and Technical Communication, was invited to present a paper entitled Current Techniques and Research in Online Reflective Journaling at the 2016 Extended Learning (XLi) Conference at Great Falls College MSU, on March 14th.
- Dr. Suzan Gazioglu of the Statistics Program co-authored a peer-reviewed article with Professor E. Marian Scott of the University of Glasgow-UK. The article "An important source of uncertainty: Modeller" appeared in the Journal of Selcuk University Natural and Applied Sciences, April 2016, 5(1), 8-17.

- Brian Kukay, Ph.D., P.E. has been appointed to serve a 6-year term on the Structural Engineering Institute's Technical Activities Division, Wood Committee. Brian will assist the committee in activities that include standardizing undergraduate and graduate curriculum for timber design in the United States. Aside from the committee, Brian will also be presenting a seminar for the National Council of Structural Engineers Associations (N.C.S.E.A.) at the end of the month on, "Fire damage and post-fire assessments of structural wood members." It has been approved by the N.C.S.E.A. for 1.5 hours of continuing education in all 50 states.
- Kay Eccleston, faculty member in Professional and Technical Communications, recently returned from Houston where she presented and chaired a panel at the 19th Annual Conference of the Association of Teachers of Technical Writing on April 6. This year's conference theme was Citizenship & Advocacy in Technical Writing. The title of her presentation was "An emerging case study in the preservation of institutional memory in civic discourse: Butte-Anaconda Greenway Service District."
- Wiley Publishing recently released **Occupational Ergonomics: A Practical Approach** by Assistant Professor in Safety, Health and Industrial Hygiene Theresa Stack, et.al. Topics include: The Basics of Ergonomics; Anthropometry; Office Ergonomics; Administrative Controls; Biomechanics; Hand Tools; Vibration; Workstation Design; Manual Material Handling; Job Requirements and Physical Demands Survey; Ergonomic Survey Tools; Work-related Musculoskeletal Disorders; How to Conduct an Ergonomics Assessment; and Case Studies
- Dr. Courtney Young, Metallurgical & Materials Engineering Department Head, has been invited to present and be a session chair at Sustainable Minerals conference in Falmouth, Cornwall, United Kingdom, June 23-24. One presentation will cover slag recycling research that his student advisee, Prince Sarfo, is doing for his MS degree. Co-authors include Dr. Avimanyu Das (Visiting Faculty from India), Gary Wyss (Lab Manager for CAMP), and Dr. Guojun Ma (Visiting Faculty from China) who returned after a yearlong visit during all of 2015. Another presentation will be a poster on ARL research Dr. Young is doing on flotation of Rare Earths. This work includes Dr. Das as well as Greer Galt (MS student) and Dr. Rod James (Professor Emeritus, Environmental Engineering)..

HIGHLANDS COLLEGE INNOVATION

- Highlands College held its Spring Student Research, Creative and Scholarly Activity Celebration the week of April 4th. The event featured poster presentations from 14 students of various majors. Some of the student projects explore very serious themes, such as student stress, technology usage, alcohol abuse and depression.
- Twenty-six Highlands College students, three Highlands faculty and two staff participated in the annual F-1 In Schools Competition involving approximately 70 students from 12 Montana high schools. The students served as scrutineering judges for the model race cars created by the high school students.
- Highlands College was awarded a \$15,000 grant from the Gene Haas Foundation to support the Machining Program. This grant from the Gene Haas Foundation will help Highlands' students work with state-of-the-art machine tooling and be successful in securing a high-skilled, high-paying career in manufacturing.
- Highlands College faculty, Denise Elakovich and Dr. Elyse Lovell, have joined a national research project in which part of their Math course curriculum involves their students joining in a MOOC (Massively Open Online Course). The national research project involves assisting students enrolled in math by incorporating psychology-based teaching concepts into the math course curricula that will propel students' motivation, determination and understanding to learn higher level math. Ms. Elakovich, along with faculty members Jeff Draper and Mary Linn Horton, are teaching the math portion of the curriculum and Dr. Lovell is teaching psychology. The national research project and MOOC are headed by Dr. Barbara Oakley, Professor of Industrial & Systems Engineering at Oakland University, using the Coursera platform.
- Highlands College continued its "Passport To Program" with a student luncheon speaker whose topic was Islam and its culture. The event was sponsored by the Highlands College Student Leadership Team. The student speaker at the Passport To... Islam and Its Culture event was international student and Biology major, Wejdan Al Obaydan from Saudi Arabia. She spoke about her Islamic religion and the Muslim culture. The Highlands College Passport to Islam and Its Culture Program is intended to further the college's mission to educate our students so that they might have a broader understanding of the world and thereby be better citizens.

- "Leap into Health" was the theme of this spring's Wellness Fair at Highlands College. Appropriately scheduled on leap day, Monday, February 29th, from 10 to 1, the Fair has become a popular event for not only students, faculty, and staff, but for the many vendors who participate. The purpose of the Montana Tech Wellness fairs is to expose Montana Tech students to the various resources on and off campus that are available in all aspects of health promotion.
- Highlands College has some brand new technology a large touchscreen TV which provides directions and other information. Network Technology student Dustin LaMiaux created the programming which runs the touchscreen and a group of Construction Technology students designed and manufactured the decorative cabinet for the television. The Highlands Touchscreen allows prospective students, parents and guests to locate faculty and staff offices and phone numbers, academic departments, computer labs, and restrooms.
- Thousands of Montanans are watching episodes of the Highlands/Montana Tech Montana History series "In the Crucible of Change," produced and moderated by Highlands' Evan Barrett which continues to play across the state. The series of 1-hour video films is now permanently archived for public use, including streaming, though Montana Tech's Digital Commons, where it is accessed via www.crucibleofchange.com . The content is also being utilized in a Montana History course taught by Evan Barrett.

MONTANA BUREAU OF MINES AND GEOLOGY ACTIVITY

- On January 27 Montana Bureau of Mines and Geology (MBMG) Data Preservation Program Leader Dr. John Metesh, Montana Bureau of Mines and Geology Director and State Geologist, hosted a geology conclave at Montana Tech on March 5. Twenty-one geoscientists from Montana State University, University of Montana, University of Montana–Western, Montana Tech, Rocky Mountain College, and the MBMG presented overviews of their programs, current research, and ideas for future collaborations. A second conclave is planned for fall 2016 to discuss hosting a future Penrose Conference on the Belt Supergroup and potential collaboration on an atlas of Montana geology to be published prior to the Bureau's centennial in 2019.
- Margaret Delaney spoke about Preserving Montana's geologic, energy development, and mining heritage to the Butte Kiwanis Club.
- On February 2 MBMG Economic Geologist Stan Korzeb presented a lecture on Polymetallic vein genesis and exploration potential for the Emery mining district, Powell County, Montana, to the economic geology class at the Department of Geosciences, Oregon State University, Corvallis, Oregon.
- MBMG Geologist Dr. Kaleb Scarberry presented an invited lecture on Mapping Late Cretaceous ignimbrites in southwestern Montana to geology classes at the Department of Geosciences, Oregon State University, Corvallis, Oregon on February 4.
- MBMG Economic Geologist Stan Korzeb attended the Society of Mining, Metallurgy, and Exploration's annual conference in Phoenix, Arizona February 21–24 and presented a paper on New models of exploration potential within the Boulder Batholith, southwest Montana.
- Cordilleran Front Range Structural Features in Northwest Montana Interpreted from Vintage Seismic Reflection Data by Montana Tech graduate student Mason Porter and co-authors Marvin Speece and MBMG Geologist Dr. Jesse Mosolf was accepted for publication by the Journal of Structural Geology. Dr. Mosolf is a member of Mason Porter's graduate committee.
- On February 25, the Montana Bureau of Mines and Geology hosted a meeting for the U.S. Geological Survey's Mineral Resources working group, which is currently evaluating the mineral potential of Bureau of Land Management lands considered to be Sage Grouse habitat and proposed for withdrawal from mineral entry. Geologists from the MBMG, the Bureau of Land Management, and the Montana Department of Environmental Quality met with three research geologists and a GIS specialist from the USGS. Information provided by the MBMG helps ensure that the lands proposed for withdrawal do not contain important mineral resources.
- MBMG Director of Earthquake Studies Michael Stickney has been appointed to the Butte-Silver Bow Local Emergency Planning Committee and is helping to update the Butte-Silver Bow pre-disaster mitigation plan.
- MBMG Hydrogeologist Kevin Chandler presented "The tale of two aquifers" to the Mondak Ag Days conference in Sidney, Montana, on March 4. The talk compared two aquifers: the Fox Hills-Hell Creek artesian aquifer that supports an ever-declining number of flowing wells, and the Lower Yellowstone

River buried channel aquifer that potentially could supply large amounts of irrigation and municipal water. Both aquifers are of great interest in far eastern Montana and western North Dakota.

- The MBMG held its annual meeting and research seminar on March 10–11. MBMG staff discussed potential changes to publications procedures, heard new scientific results from major programs, and received training in public presentations.
- On March 19, 2016, MBMG Hydrogeologist Dr. Gary Icopini led Dr. Payton Gardner's hydrogeology class from the University of Montana on a tour of Butte Super Fund sites.
- MBMG Geologist Dr. Jesse Mosolf hosted the Montana State University Geology Club at the MBMG on March 25, 2016. Ten graduate and undergraduate students spent the day on the Montana Tech campus learning about the MBMG's programs, touring the Mineral Museum, and joining Dr. Mosolf on a short field trip to Big Butte to discuss the geology of the Butte area.
- Dr. Elizabeth Meredith, MBMG Hydrogeologist, presented Energy and Groundwater to the Montana Energy Summit 2016 held in Billings, Montana, on March 30. Dr. Meredith discussed MBMG products that are of use to the energy industry.
- MBMG Director of Earthquake Studies Michael Stickney was invited to speak about Historic earthquakes and seismic hazards in Montana at the quarterly meeting of the Montana Indian Nations Working Group in Polson, Montana, on March 31. Members from six of Montana's seven Indian Nations attended, along with Federal and State agency representatives involved with emergency preparedness and response.
- MBMG Ground Water Investigations Program hydrogeologists John Wheaton and James Rose presented The deep aquifer and subsurface geology of the Flathead Valley at a public meeting at the Flathead Valley Community College on April 6. A recent water-rights application for a well that would supply water for bottling has caused local concern about potential consequences on groundwater resources. The interest shows how work by the MBMG often relates directly to local groundwater problems and concerns.
- The Montana Bureau of Mines and Geology released Open-File Report 671: Butte mine flooding operable unit water-level monitoring and water-quality sampling 2011 consent decree update, Butte, Montana 1982–2011, by Ted Duaime and Nicholas Tucci; Open-File Map 672, Geologic map of the Finn 7.5' quadrangle, Lewis and Clark and Powell Counties, Montana, by Catherine McDonald, Dr. Jesse Mosolf, and Susan Vuke; and Open-File Map 673, Geologic map of the Nevada Lake 7.5' quadrangle, Lewis and Clark and Powell Counties, Montana, by Catherine McDonald and Dr. Jesse Mosolf.