News Update:
September 2015
Volume 18, Issue 4

Dear Readers,

In July, CBE welcomed **Matthew Fields**, professor of microbiology and immunology at Montana State University, as its new director. Dr. Fields previously served as interim head of MSU's Department of Microbiology (now Microbiology and Immunology). He heads CBE's Physiology and Ecology Lab, where his research is focused on metabolic and genetic processes of microbes and biofilms.

Dr. Fields has won numerous awards and journal editorships, including the MSU Award for Excellence and the Wiley Award for Meritorious Research. He currently serves as specialty editor for the journal *Frontiers in Microbiology* and Academic Editor for *PLoS One*, and he is a Research Fellow at the National Center for Genome Resources in Santa Fe, NM.

Dr. Fields succeeds **Phil Stewart**, professor of chemical and biological engineering, who spent much of his career at MSU conducting research with the CBE before stepping in as director in 2005.

A link to a full story on Dr. Fields, his research, and his appointment can be found below under "Employee News."

Industry Highlights

Highlights from the Montana Biofilm Meeting, July 2015

Sixty-five industry representatives and academic visitors met in Bozeman for updates and discussion about recent developments in biofilm science and engineering. The July 2015 Montana Biofilm Meeting included topic areas on biofilm mineral interactions, oilfield biofilms, medical biofilms, new tools in image analysis, methods, and microfluidics, and a US regulatory review. CBE's open house, held on the afternoon of Tuesday, July 14, provided opportunities for interaction through lab demonstrations and poster presentations. Attendees experienced hands-on learning in several CBE labs including standard methods, biofilm control, medical biofilms, and microbial ecology.

CBE hosted one pre-meeting workshop on Monday, July 13 "Biofilm Methods for Your Lab."

The next Montana Biofilm Science and Technology Meeting is scheduled for July 19–21, 2016 in Bozeman. An agenda and registration will be available starting May 2016. For more information about the meeting, contact Paul Sturman (paul_s@biofilm.montana.edu).

Meeting agenda (pdf)

Lonza joins CBE Industrial Associates Program

The CBE recently welcomed **Lonza** as its newest Industrial Associate member.

Lonza is one of the world's leading suppliers to the pharma, biotech, and specialty ingredient markets. Their products and services range from active pharmaceutical ingredients and stem-cell therapies to drinking water sanitizers; industrial preservatives to microbial control solutions that combat dangerous viruses, bacteria and other pathogens; and manufacturing of vitamin B compounds and organic personal care ingredients to agricultural services and products. **Denise Taylor** is the CBE designated representative. Read more about Lonza at: http://www.lonza.com

View a list of CBE Industrial Associates

Read about CBE membership

Research Highlights

Darla Goeres awarded Burroughs Wellcome Innovation in Regulatory Science Award

MSU-CBE faculty member **Darla Goeres**, associate research professor of chemical and biological engineering, was recently awarded a Burroughs Wellcome Innovation in Regulatory Science Award. Goeres will receive $500,000 over five years to develop new methodology to assess the prevention of biofilm formation on medical devices. She is one of five recipients of the award.

Read more about Goeres and her BW award at: http://www.montana.edu/news/15783/msu-faculty-member-earns-grant-award-for-biofilm-methodology-research

Latest Publications

Eggers MJ, Moore-Nall AL, Doyle JT, Lefthand MJ, Young SL, Bends AL, Crow Environmental Health Steering Committee, **Camper AK**
"Potential health risks from uranium in home well water: An investigation by the Apsaalooke (Crow) tribal research group"
Geosciences, 2015; 5(1):67–94.

Lauchnor EG, **Topp DM**, **Parker AE**, **Gerlach R**
"Whole cell kinetics of ureolysis by *Sporosarcina pasteurii*"
J Appl Microbiol., Jun 2015; 118(6):1321–32.

Smith HJ, **Foreman CM**, Ramaraj T
"Draft genome sequence of a metabolically diverse Antarctic supraglacial stream organism, *Polaromonas sp.* strain CG9_12, determined using pacific biosciences single-molecule real-time sequencing technology"
Genome Announc., Dec 2014; 2(6):e01242.

Smith MB, Rocha AM, Smillie CS, Olesen SW, Paradis C, Wu L, Campbell JH, Fortney JL, Mehlhorn TL, Lowe KA, Earles JE, Phillips J, Techtmann SM, Joyner DC, Elias DA, Bailey KL, Hurt RA Jr, Preheim SP, Sanders MC, Yang J, Mueller MA, Brooks S, Watson DB, Zhang P, He Z, Dubinsky EA, Adams PD, Arkin AP, **Fields MW**, Zhou J, Alm EJ, Hazen TC
"Natural bacterial communities serve as quantitative geochemical biosensors"
MBio. May 2015; 6(3):e00326.

Washburn KE, Anderssen E, **Vogt SJ**, **Seymour JD**, Birdwell JE, **Kirkland CM**, **Codd SL**
"Simultaneous Gaussian and exponential inversion for improved analysis of shales by NMR relaxometry"
J Magn Reson., Jan 2015; 250:7–16.

View Publications database

Education

Sarah Codd receives national recognition as an inspiring woman in STEM

MSU-CBE faculty member, **Sarah Codd**, professor of mechanical and industrial engineering, was recently selected by a national magazine as one of its 100 Inspiring Women in STEM Award.

Read more about Sarah and her award at *MSU News Service*: MSU professors receive national recognition as inspiring women in STEM

Thesis Alert

"Transport of dissolved and particulate material in biofilm-lined tubes and channels," successful thesis defense by **Benjamin Jackson**, PhD candidate, mathematics, Montana State University, August 17, 2015.
Read abstract

"Denitrification at the microscale in treatment wetlands," successful thesis defense by **Justin Spengler**, masters candidate, civil engineering, Montana State University, August 10, 2015.
Read abstract

View Thesis database

Employee News

Dr. Matthew Fields, professor in MSU's Department of Microbiology and Immunology, has been appointed director of the Center for Biofilm Engineering.

Read the full article about Fields, his research, and his appointment at *MSU News Service*: MSU's Center for Biofilm Engineering names Matthew Fields as new director

CBE Awards

The Center for Biofilm Engineering presented their 2015 awards for outstanding researcher and lab citizen at their Montana Biofilm Science and Technology Meeting in July.

Diane Walker, CBE research engineer, received the CBE Outstanding Researcher Award. Walker was recognized for her commitment to the CBE Industrial Associates Program, her dedication in organizing and presenting biofilm workshops, and for contributions to creating a quality Standardized Biofilm Methods research program. The Outstanding Researcher Award is open to any CBE researcher or faculty member. The criteria for selection include research quality, teamwork, willingness to mentor others and willingness to contribute to CBE outreach efforts through the Montana Biofilm Meetings and workshops.

Catherine (Cat) Kirkland, PhD student in chemical and biological engineering, received CBE's Student Lab Citizen Award. Kirkland was recognized for strong work ethic, productivity, and excellence in research; as well as for taking initiative in establishing the Graduate Seminar Series, organizing the Three Minute Thesis Competition, supporting Engineers Without Borders, and mentoring students through College of Engineering programs. The Student Lab Citizen Award is open to any CBE student and recognizes a student's exceptional responsibility and good citizenship in his or her work at the CBE. Attributes that are considered in selecting awardees include: attention to laboratory safety and cleanliness, considerate use of shared spaces, respect for equipment and proper protocols, willingness to help fellow students and staff, strong work ethic, and commitment to CBE goals. The award is presented in honor of John Neuman, the CBE's Technical Operations Manager from 1994–2008 and was established by John's family after his death in 2011.

New Staff

CBE recently welcomed the following postdoctoral researchers to its staff:

Zack Jay received his PhD in ecology from Montana State University's Department of Land Resources and Environmental Sciences. His research focus was microbial ecology in Yellowstone National Park. Jay is currently working for **Ross Carlson**, associate professor of chemical and biological engineering, on metabolic modeling of electron fluxes for fundamental understanding and biofuels synthesis as part of the DOE Center for Biological Electron Transfer

and Catalysis (BETCy) grant. Originally from Glenwood Springs, Colorado, Jay enjoys all of the outdoor activities of the Rocky Mountains—alpine and backcountry skiing, hiking and biking, camping, and fly fishing.

Shipeng Lu earned his PhD in 2012 from the Aquatic Geomicrobiology Group, Institute of Ecology, at Friedrich Schiller University in Jena, Germany. His research focus was microbial iron cycling in pelagic aggregates (iron snow) and sediments of an acidic mine lake. Lu is working for **Robin Gerlach**, professor of chemical and biological engineering, on algal biofuels. In addition to getting acclimated to Bozeman and the CBE, Lu and his wife are busy raising their 21-month-old twin sons. Lu is from Nanjing, China and both he and his wife speak Mandarin, Korean, English, and some German.

Luke McKay is originally from Birmingham, Alabama. He received his PhD from the Department of Marine Sciences at the University of North Carolina at Chapel Hill where he studied microbial ecology at hydrothermal seeps in Guaymas Basin, Gulf of California. McKay earned a NASA postdoctoral fellowship through the NASA Astrobiology Institute to study primitive microbial processes in Yellowstone National Park. He will use molecular analyses and cultivation techniques to examine the distribution, functional capacity, and potential biomarker formation of methanogens in the park. McKay is co-advised by **Matthew Fields**, professor of microbiology and immunology, and Bill Inskeep, professor in MSU's Department of Land Resources and Environmental Sciences. McKay enjoys all-things-Bozeman: backpacking, climbing, mountain biking, and snowboarding; and, he thinks snakes are cool!

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New Technical Operations Manager

CBE is pleased to announce **Kristen Brileya** as its new technical operations manager. Brileya received her PhD from MSU's Department of Microbiology and Immunology. She was an IGERT fellow studying anaerobic community ecophysiology. Upon graduation, Brileya spent two years as a postdoc at Portland State University working with Anna-Louise Reysenbach before returning to MSU to work with Matthew Fields. She hails from Fort Ann, New York where she grew up working on her family's vegetable farm. Brileya is excited to be working at the CBE because she is a problem solver and enjoys helping others with their research challenges. She looks forward to the opportunity to facilitate research and keep things running smoothly and safely at CBE. Personally, Brileya is active in Montana outdoor activities—skiing, hiking, hunting, and biking. She also enjoys playing hockey and working around her homestead where she gardens, raises a variety of animals, and experiments with home fermentation.

Outreach

CBE's Standardized Biofilm Methods Laboratory will be hosting a workshop "Standardized Biofilm Methods: Development and Application," at the upcoming ASM Biofilms conference in Chicago, Illinois, October 24–29, 2015. The workshop is one of three pre-meeting workshops offered by the ASM Biofilms conference, which is the premier science-oriented international biofilm meeting planned for the next two years.

To view the workshop agenda, go to: http://conferences.asm.org/index.php/upcoming-conferences/7th-asm-conference-on-biofilms/125-conferences/7th-asm-conference-on-biofilms/310-workshop-program#W3

http://bit.ly/1L6QBRz

Visiting Scholars

Luigi Frunzo, Assistant Professor, Mathematics, University of Naples, Italy
Research area: Mathematical modelling
CBE host: **Isaac Klapper**, professor, mathematics

Greg Characklis, Professor, Environmental Sciences and Engineering, School of Global Public Health, University of North Carolina at Chapel Hill
Research area: Algal biofuels
CBE host: **Robin Gerlach**, professor, chemical and biological engineering

Visiting Students

Adam Hise, PhD student, environmental sciences & engineering, University of North Carolina at Chapel Hill.
Area of study: Algal biofuels
CBE host: **Robin Gerlach**, professor, chemical and biological engineering

Johannes Hommel, PhD student, environmental engineering, University of Stuttgart, Stuttgart, Germany
Area of study: Biomineralization barriers in porous media
CBE host: **Al Cunningham**, professor emeritus, civil engineering

Jordan Martin, undergraduate, New Mexico State University, Las Cruces, New Mexico
Area of study: Genetics and biotechnology
CBE host: **Connie Chang**, assistant professor, chemical and biological engineering

Mario Perez, Masters candidate, Universidad Autonoma de San Luis Potosi, San Luis Potosi, Mexico
Area of study: Antibiofilm evaluation of chitoson gel
CBE host: **Garth James**, CBE medical projects manager

Yeni Yung, PhD student, University of Illinois at Chicago, Illinois
Area of study: Mass spectroscopy imaging of biofilm proteome and metabolome for analysis of the CBE chronic wound model system
CBE host: **Ross Carlson**, associate professor, chemical and biological engineering

Industrial Visitors

CBE hosted two representatives from Lonza Specialty Ingredients on September 1–2, 2015. Denise Taylor, Leader for the Center of Excellence in Microbiology, and Andreas Heyl, Chief Technology Officer met several CBE faculty and researchers to learn about CBE's research areas and discuss potential collaborative projects. Lonza joined the CBE Industrial Associates Program in June 2015.

CBE lab tours

On September 1, 2015 CBE hosted a tour for a group of undergraduate students from Kumamoto University in Kumamoto, Japan. Kumamoto is an MSU sister university. The visit was sponsored by MSU's Office of International Programs. CBE tour leader: Kristen Brileya, technical operations manager.

People in Action

The following CBE researchers presented research at the American Society for Microbiology (ASM) 2015 general meeting, New Orleans, LA, May 30–June 2, 2015:

Invited talks:
Laura Camilleri, PhD student, microbiology & immunology as an invited speaker presented "Altered gene expression in a methanogenic, symbiotic biofilm."

Greg Krantz, PhD student, microbiology & immunology, as an invited speaker presented "Electron donor limitation promotes metal corrosion by *Desulfovibrio alaskensis* G20 biofilms."

Student travel award:
Tatsuya Akiyama, PhD student, microbiology & immunology, won a student travel award to present the poster "Regulation of hibernation promoting factor (hpf) and ribosome modulation factor (rmf) of *Pseudomonas aeruginosa* includes transcriptional and post-transcriptional mechanisms."

Poster presentations:
Tisza Bell, PhD student, microbiology & immunology, presented "Monitoring community ecology in wastewater treatment lagoons for the production of algal biodiesel."

Luisa Corredor-Arias, PhD student, microbiology & immunology, presented "Nutrient and temperature stress for lipid accumulation in a novel environmental green microalgae."

Lakota Doig, master's student, microbiology & immunology, presented "Lipid accumulation with mixed photoautotrophic cultures from municipal wastewater."

Lauren Franco, PhD student, microbiology & immunology, presented "Effects of nutrient limitation on *Desulfovibrio vulgaris* biofilm composition, structure, and metal deposition."

Logan Hodgskiss, CBE research assistant, presented "Growth of a native algal species in coal bed methane water for biofuel and biomass accumulation."

Anna Zelaya, PhD student, microbiology & immunology, presented "'Species filter' effects on sediment biofilms and groundwater source diversity."

The following CBE PhD students presented research at the Biochemical Society's Metabolic Pathways Analysis 2015 meeting, Braga, Portugal, June 8–12, 2015:

Kris Hunt, PhD student, chemical & biological engineering, as an invited speaker presented "Stoichiometric analysis of primary autotrophy and biomass turnover in a thermoacidophilic iron oxidizing archaeal community."

Ashley Beck, PhD student, microbiology & immunology, presented the poster "Elementary flux mode analysis of irradiance-induced stress acclimation strategies in the thermophilic cyanobacterium *Thermosynechococcus elongatus* BP-1."

Phil Stewart, professor, chemical & biological engineering, as invited speaker presented the following research:

"Mechanics of biofilm detachment in flowing fluids," Eurobiofilms 2015, Brno, Czech Republic, June 23–26, 2015.

"Persistence and initiation of biofilms on medical devices," The 3rd Stevens Conference on Bacteria-Material Interactions, Hoboken, NJ, June 17–18, 2015.

Diane Walker, CBE research engineer, as an invited speaker presented "Laboratory techniques for studying biofilm," International Association for Food Protection (IAFP), Portland, OR, July 25–28, 2015.

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