

News Update:
April 2016
Volume 19, Issue 1

Industry Highlights

PPG joins CBE Industrial Associates Program

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

PPG Industries was founded in 1883 when Capt. John B. Ford and John Pitcairn started the first commercially successful plate glass factory in the US at Creighton, Pennsylvania. Known as the Pittsburgh Plate Glass Co., the enterprise focused on innovation and quality. After 130 years, PPG is a global supplier of paints, coatings, optical products, specialty materials, glass and fiber glass. For more information about the company go to: <http://corporate.ppg.com/Home.aspx>

View a list of [CBE Industrial Associates](#)

Read about [CBE membership](#)

Highlights from CBE's regulatory-focused meeting with the FDA and EPA

The CBE recently hosted its third annual regulatory-focused meeting in the Washington D.C. area. On February 10th, 115 representatives from industry, agency, and academia attended "Anti-Biofilm Technologies: Pathways to Product Development," in Arlington, Virginia. The EPA and FDA had a strong presence at the meeting, with over 25 attendees and 3 speakers on the agenda. The meeting included a morning session on Medical Device Technologies and an afternoon session on Surface Disinfection Technologies. Each session was followed by a panel discussion in which attendees were able to ask questions of panel members, including our EPA and FDA speakers. The format provided for lively discussion and gave attendees an opportunity to understand the challenges that both regulatory agencies and industry scientists face.

New for this meeting, the CBE hosted a pre-meeting workshop on beneficial biofilms. The workshop included presentations from academic and industry speakers on current research and commercialization efforts using beneficial bacterial or fungal biofilms. Research was presented from diverse topic areas such as medical biofilms, industrial biofilms (corrosion prevention, mineral exploitation) and energy-related biofilms. The workshop concluded with a panel discussion on how products are regulated. Seventy-five industry, agency, and academic representatives attended the workshop. Agendas for both the meeting and workshop are linked below.

Final [meeting agenda](#) (pdf)

Final [workshop agenda](#) (pdf)

Upcoming Biofilm Science and Technology Meeting: July 19–21, 2016 in Bozeman

Accepting abstracts for Young Investigator Award

CBE will be hosting its next biofilm science and technology meeting this July 19–21 in Bozeman, Montana. Registration will open May 10, 2016. Session topics include:

Fungal biofilms
Multi-species biofilms
Industrial challenges with biofilms
Medical biofilms/Wounds
Methods

*We are still accepting abstracts for the Young Investigator award. This program supports the research of non-MSU biofilm investigators and allows for two postdocs or newly hired faculty to present their research at our biofilm meeting in July. For more information about the program and abstract submission, [click here](#).

Contact [Paul Sturman](#) for information about the Industrial Associates Program or upcoming meetings and workshops.

Research Highlights

CBE bio-statistician earns top EPA award

Al Parker, CBE bio-statistician, was recently awarded an EPA 2015 Scientific and Technological Achievement Award, Level 1. This award is given to top contributors to the advancement of science and technology through their publications in peer-reviewed articles and books. Parker was part of a research team that included Steve Tomasino, EPA senior scientist, **Martin Hamilton**, MSU-CBE professor emeritus in statistics, and Gordon Hamilton, statistical analyst with Big Sky Statistical Analysts. The authors submitted two papers that focused on using statistical tools to evaluate test methods for killing bacteria on surfaces. Their work was published in the *Journal of AOAC International*. AOAC INTERNATIONAL is a globally recognized agency in standards development.

To read about Parker's research and his EPA award [click here](#)

Latest Publications

De León KB, Utturkar SM, **Camilleri LB**, Elias DA, Arkin AP, **Fields MW**, Brown SD, Wall JD

“Complete genome sequence of *Pelosinus fermentans* JBW45, a member of a remarkably competitive group of Negativicutes in the Firmicutes Phylum”
Genome Announc., Sep 24 2015; 3(5): pii: e01090–15.

[Read abstract](#)

Kirkland CM, Herrling MP, Hiebert R, Bender AT, Grunewald E, Walsh DO, Codd SL
“In situ detection of subsurface biofilm using low-field NMR: A field study”
Environ Sci Technol., 2015 Sep 15; 49(18):11045–52.

[Read abstract](#)

Stewart PS

“Prospects for anti-biofilm pharmaceuticals”
Pharmaceuticals, 2015 Aug 27; 8(3):504–11.

[Read abstract](#)

Stewart PS

Book chapter: “Antimicrobial tolerance in biofilms”
Book title: Microbial Biofilms, 2nd Edition. Ghannoum MA, Parsek M, Whiteley M, Mukherjee P (eds.)
ASM Press, 2015; pp. 269–285.
Also featured in: *Microbiol Spectr.*, Jun 2015; 3(3).

[Read abstract](#)

Franklin M, Chang C, Akiyama T, Bothner B

Book chapter: “New technologies for studying biofilms”
Book title: Microbial Biofilms, 2nd Edition. Ghannoum MA, Parsek M, Whiteley M, Mukherjee P (eds.)
ASM Press, 2015; pp. 1–23.
Also featured in: *Microbiol Spectr.*, Aug 2015; 3(4).

[Read abstract](#)

Figuroa LO, Schwarz B, Richards AM

“Structural characterization of amphiphilic siderophores produced by a soda lake isolate, *Halomonas* sp. SL01, reveals cysteine-, phenylalanine- and proline-containing head groups”
Extremophiles, November 2015; 19(6):1183–1192.

[Read abstract](#)

Kirker KR, Fisher ST, James GA

“Potency and penetration of telavancin in staphylococcal biofilms”
Int J Antimicrob Agents, Oct 2015; 46(4):451–455.

[Read abstract](#)

Education

[Two CBE doctoral candidates awarded NSF-EAPSI Fellowships](#)

Jeff Simkins and **Sarah Mailhiot** were recently awarded an 8-week fellowship in the National Science Foundation’s East Asia and Pacific Summer Institutes Program (EAPSI). The program is designed to introduce U.S. graduate students to East Asia and Pacific science and engineering in

a research setting, and to help students initiate scientific relationships that will better enable future collaboration with foreign counterparts.

Simkins is a PhD candidate in chemical engineering and will be traveling to Australia to work with Drs. Michael Johns and Einar Fridjonsson at the University of Western Australia in Perth. Simkins is pioneering a novel, non-invasive magnetic resonance method for measuring oxygen distribution in a biofilm. In Perth, he will repurpose this technique for the early, non-invasive detection of biofouling (microbial degradation) in reverse osmosis membranes. Reverse osmosis membranes have become the gold standard for water desalination, but are very susceptible to microbial degradation. The hope of this project is that, if biofouling can be identified in the early stages, damage to the membrane can be prevented. Simkins works for CBE affiliated faculty members **Joseph Seymour** and **Philip Stewart**, both professors in MSU's Department of Chemical and Biological Engineering.

Mailhiot is a PhD candidate in mechanical engineering and she will travel to New Zealand to work with Dr. Petrik Galvosas at the Victoria University of Wellington. Mailhiot currently works in MSU's Magnetic Resonance Lab where she studies how the lining of the human joint, known as cartilage, changes during arthritis. In Wellington, she will study how one protein in cartilage, collagen, affects the fluid-solid interactions in human cartilage using collagen hydrogels as a model system. This project will show how damage to collagen is related to arthritis in human cartilage. Mailhiot's advisors are Ron June, assistant professor in mechanical and industrial engineering, Joseph Seymour, and CBE affiliated faculty member **Jennifer Brown**, associate professor in chemical and biological engineering.

CBE PhD student takes first place at Three-Minute Thesis competition

For a second straight year a group of graduate students from Montana State University gave the public a chance to hear an 80,000-word thesis distilled into 180 seconds. MSU hosted the Three-Minute Thesis event on March 3rd at the Procrastinator Theater in the Strand Union Building.

The seven finalists chosen for the 3-Minute Thesis competition are from disciplines across MSU's College of Engineering. The finalists explained, very concisely, how their research might affect the public. Presenters were required to condense their research into a brief, engaging presentation for a non-specialist audience, using a single presentation slide.

Finalist **Jeff Simkins** took first place in the competition with his presentation "MRI: A new tool in the fight to end infectious disease."

For a list of the finalists go to *MSU News Service*: "[Three-Minute Thesis event set for March 3 at MSU](#)"

Thesis Alert

"Microbial community composition and the transformation of dissolved organic matter in supraglacial environments," successful thesis defense by **Heidi Smith**, PhD candidate, land resources and environmental sciences, March 31, 2016.

[Read abstract](#)

“Lipid accumulation in mixed photoautotrophic cultures from municipal wastewater,” successful thesis defense by **Lakotah Doig**, masters candidate, microbiology and immunology, April 4, 2016.

[Read abstract](#)

“A high-throughput, multiplexed microfluidic method utilizing an optically barcoded drop library,” successful thesis defense by **Geoffrey Zath**, masters candidate, chemical & biological engineering, April 15, 2016.

[Read abstract](#)

Employee News

Eric Troyer, research technician for Robin Gerlach (MSU-CBE professor, chemical and biological engineering), was recently awarded a National Science Foundation-Graduate Research Fellowship (NSF-GRFP). This NSF program recognizes outstanding graduate students in NSF-supported science, technology, engineering, and mathematics disciplines who are pursuing research-based masters and doctoral degrees. Fellows benefit from a three-year annual stipend, a cost of education allowance for tuition and fees, the opportunity for international research and professional development, and the freedom to conduct their own research. Eric will be attending graduate school at the University of California at Berkeley. He graduated from MSU in December 2015 with dual degrees in chemical engineering and biological engineering.

Danielle Hanger, CBE work-study administrative assistant, was one of thirteen Montana State University students that were recently honored with 2016 Students of Achievement awards at the university’s 24th annual Women’s History Month reception. Students of Achievement are selected based on excellence in promoting diversity and equality, demonstration of strong leadership and service as exemplary role models for their peers. In addition to their studies, the students have all been active in research and volunteer work relating to the core issues and goals of the Women’s Center, as well as their individual fields of study. The event was sponsored by the MSU Women’s Center and the MSU Alumni Foundation. Danielle has been a valuable member of the CBE support staff since 2014. She will graduate in May 2016 with a double major in cell biology and neuroscience/psychology. Upon graduation, Danielle will head to Pacific University to pursue a PsyD in clinical psychology.

New Staff

The CBE recently welcomed **Erika Espinoza-Ortiz** as a postdoctoral researcher working for Dr. Robin Gerlach, MSU-CBE professor in chemical and biological engineering. Erika received her PhD in Environmental Technologies for Contaminated Solids, Soils and Sediments as part of an Erasmus Mundus Joint Doctorate Program at UNESCO-IHE in Delft, Netherlands in December 2015. Her research focused on the mycogenic production of selenium and tellurium nanoparticles. Currently, Erika is working on biomineralization projects as well as fungal and

algal biofilm projects in the Gerlach lab.

Outreach

MSU-CBE faculty member **Darla Goeres**, associate research professor in chemical and biological engineering, was elected chairwoman of ASTM International Main Committee E35 for a two year term starting January 1, 2016. ASTM International, formerly known as the American Society for Testing and Materials (ASTM), is a globally recognized leader in the development and delivery of international voluntary consensus standards. Committee E35 is responsible for the development of standard definitions, classifications, appropriate test methods, and recommended practices relating to efficacy, safety, quality, and impact in appropriate environments of pesticides, antiseptic and antimicrobial agents, biological agents, devices, and equipment.

CBE Industrial/Agency Visits

The following CBE personnel met with industry members to discuss future projects:

Matthew Fields, Darla Goeres, Al Parker, and Garth James visited Procter and Gamble in Cincinnati, Ohio on March 7, 2016.

Paul Sturman visited PPG in Cleveland, Ohio on April 4, 2016.

On January 28, 2016 representatives from PPG visited the CBE. Peter Votruba-Drzal, Steve Zawacky, and Tom Kelly toured the CBE, met with several faculty and researchers, and discussed membership with Paul Sturman.

Garth James presented the seminar, “Beneficial biofilm and the human body,” at BASF in Tarrytown, New York, April 6, 2016.

Visiting Scholars

CBE is pleased to welcome **Lea Tan**, visiting PhD student from UNESCO-IHE in Delft, Netherlands. Lea is working on selenium reduction in biofilms in Dr. Robin Gerlach’s lab. At her home university, Lea is part of the Environmental Technologies for Contaminated Solids, Soils and Sediments (ETECOS₃), an Erasmus Mundus Joint Doctorate Program.

People in Action

Mari Eggers, CBE research scientist, presented “Community-based cumulative risk assessment of exposure to waterborne contaminants on the Crow Reservation,” at NIEHS Conference on Traditional Ecological Knowledge (TEK) Workshop, Bethesda, MD, December 1–5, 2015.

Karen Moll, PhD student, microbiology & immunology, presented the poster “Scaffolding 3rd generation sequence contigs using dovetail and bionano technologies,” at Plant and Animal Genome Conference (PAG XXIV), San Diego, CA, January 9–13, 2016.

Michael Vigers, undergraduate student, chemical & biological engineering, presented his research “Characterizing biofilm extracellular matrices with mechanical measurement techniques,” at Biophysical Society’s 60th Annual Meeting, Los Angeles, CA, February 27–March 2, 2016. *Vigers received an Education Committee Travel Award to present his research at this meeting.

Phil Stewart, professor, chemical & biological engineering, as an invited speaker presented “How biofilms resist sanitizers,” at the Beef Industry Safety Summit, Austin, TX, March 1–3, 2016.

Neerja Zambare, PhD student, chemical engineering, presented, “Optimizing microbially induced calcite precipitation under radial flow conditions” at the 251st American Chemistry Society (ACS) National Meeting, San Diego, CA, March 13–17, 2016.

*Zambare’s presentation was selected as one of the two best presentations in the Carbonate and Sulfate Minerals Symposium (out of 8 presenters) and she received an ACS Student Travel Award to present her research.

Matthew Fields, CBE director, presented “Coal-dependent natural gas production in the Powder River Basin,” at Montana Energy 2016, Billings, MT, March 29–31, 2016.

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