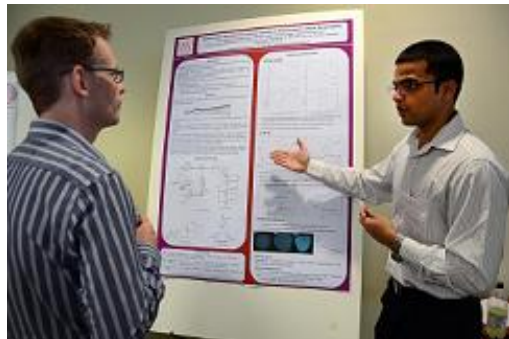




2nd Annual Graduate Research Symposium 2013

Sponsored by **The Dow Chemical Co.**
Organized by **William G Lowrie Department of
Chemical and Biomolecular Engineering**

The Department of Chemical & Biomolecular Engineering Annual Graduate Research Symposium was started in 2012 to provide an opportunity for students to showcase their exemplary research conducted in the department to distinguished professionals in the industry and receive their feedback. The day-long event features oral and poster presentations by the graduate students. It also provides a networking platform for the industry professionals and students alike.



Keynote Speaker

Rich Brandon is the Global Supply Chain Director for the Dow Water & Process Solutions business. He assumed his current position in late 2010 and is responsible for defining and executing the supply chain strategies and operational tactics to achieve the service, growth, and cost objectives of this one billion dollar specialty business.

In 2008, Rich was designated as the Global Business Integration Leader for Dow's acquisition of the Rohm & Haas Company. Rich led the integration of multiple Dow and Rohm & Haas businesses into a newly created, \$5 billion specialty materials business portfolio in the Advanced Materials Division. In 2006, he was named a Senior Master Black Belt Business Consultant for Diamond Value Chain Consulting in Dow's Business Services organization. In that role, Rich provided Six Sigma and Marketing Excellence leadership, teaching and consulting to Dow's North American businesses and functions.

Rich earned a Bachelor of Science degree in Chemical Engineering from The Ohio State University in 1983 and received an executive MBA from Indiana University in 1998. He was recognized by the College of Engineering with the Texnikoi Outstanding Alumnus Award in 2001 and the Dean's Meritorious Service Award in 2004. He was certified as a Six Sigma Black Belt in 2004 and Master Black Belt in 2008. Rich has a long standing relationship with The Ohio State University. He is the Director of Dow's Recruiting and College Relations Team for Ohio State and serves on the Advisory Board for the Department of Chemical and Biomolecular Engineering.



Rich Brandon
*Global Supply
Chain Director
The Dow Chemical
Company*





William G. Lowrie Department of Chemical and Biomolecular Engineering

CBE is a top program that attracts acclaimed faculty and talented, highly motivated students. The Department of Chemical and Biomolecular Engineering graduated a total of 138 students including BS, MS and PhD degrees in the academic year of 2012-2013. The CBE graduate program is designed to prepare students for independent research careers in industry or academia. The department provides the graduate students with a world class innovative research program in the areas of

- Bioengineering, Biotechnology, Membranes
- Colloids, Aerosols, Particle Technology
- Fluid Mechanics, Multiphase Flow
- Molecular Thermodynamics and Simulation
- Polymers, Nanomaterial
- Reaction Engineering, Catalysis
- Energy, Sustainability



CBEC Building

The new 225,000 gross sq.ft. Chemical and Biomolecular Engineering and Chemistry (CBEC) Building will be located in the heart of the science and engineering neighborhood at Ohio State. The total project budget is \$126 million. The building will also adopt the sustainable design practices by Labs 21 in addition to a LEED Silver minimum.

The new CBEC building complex is conceived as a community of scientists, engineers, postdoctoral fellows, graduate students, and technical staff working collaboratively in the areas of research in Chemistry and Chemical & Biomolecular Engineering (CBE): (1) nano/bioscience and technology, (2) energy-related materials, (3) energy and the environment, and (4) theory, modeling, and simulations.

These facilities are not intended to simply replace existing laboratory facilities already available, but will substantially upgrade and expand them to enable a strong focus on interdisciplinary research.





GRADUATE RESEARCH SYMPOSIUM 2013

EVENT SCHEDULE

Time	Event	Venue
8:00 – 9:00 AM	Breakfast/Check-in	Room 140, Pfahl Hall
9:00 – 9:15 AM	Opening Remarks – Prof. Stuart Cooper	Room 140, Pfahl Hall
9:15 – 9:45 AM	Keynote Address – Rich Brandon(Dow Chemical)	Room 140, Pfahl Hall
9:45 – 11:00 AM	Oral Presentations – Session 1	Room 140, Pfahl Hall
11:00 – 11:15 AM	BREAK	
11:15 – 12:30 PM	Oral Presentations – Session 2	Room 140, Pfahl Hall
12:30 – 1:30 PM	Lunch	Ballroom, The Blackwell Inn
1:30 – 4:00 PM	Poster Session	Ballroom, The Blackwell Inn
4:00 – 5:00 PM	Reception/Informal Meeting	Ballroom, The Blackwell Inn



GRADUATE RESEARCH SYMPOSIUM 2013

ORAL PRESENTATION SCHEDULE

9:45AM – 12:30PM | Room 140, Pfahl Hall

Time	Abstract #	Presentation Title
9:45 - 10:00 AM	B.1	Enantiospecificity of Thin Metal Films On Chiral SrTiO₃ surfaces Simuck Yuk
10:00 - 10:15 AM	A.2	Analysis of Complex Biochemical Reaction Network Behavior: Recent Advances in Species-Reaction Graph Theory Daniel Knight
10:15 - 10:30 AM	D.5	Advanced Reverse Osmosis Membranes for Seawater Desalination Lin Zhao
10:30 - 10:45 AM	A.7	Development of biosensors to identify new chemicals against dengue fever vectors Miriam Shakalli
10:45 - 11:00 AM	E.4	Reusable v. Disposable Cups Revisited: A life cycle comparison based on scenario, model, and parameter uncertainties Laura Merugula
11:00 - 11:15 AM	BREAK	
11:15- 11:30 AM	B.5	Role of Transition Metal in Non-noble Metal Electro-catalysts for the Oxygen Reduction Reaction Deepika Singh
11:30 - 11:45 AM	A.5	Directed Evolution of Inteins for Mammalian Cell Expression Michael Coolbaugh
11:45 - 12:00 PM	E.1	Eco-Synergy Design: Integrating Technological and Ecological Systems on Campus for Sustainability Erin Gibbemeyer
12:00 - 12:15 PM	D.9	New Membranes Structures and Compositions Effective for CO₂ Separation and Capture Yuanxin Chen
12:15 - 12:30 PM	A.11	High cell density propionic acid fermentation process with an acid tolerant strain of <i>Propionibacterium acidipropionici</i> Zhongqiang Wang

Session Chairs: 9:45 – 11:00 AM – Elif Miskioglu | 11:15 – 12:30 PM – Matt Gallovic



GRADUATE RESEARCH SYMPOSIUM 2013 POSTER PRESENTATIONS

1:30 – 4:00 PM | Ballroom, The Blackwell Inn

Abstract #	Presentation Title	Abstract #	Presentation Title
A.1	Rise of CD16+/CD115+ Circulating Monocytes in Metastatic Cancer Patients Clayton Deighan	B.3	Conversion of Woody Biomass Material by Chemical Looping Process - Kinetics, Tar Cracking and Moving Bed Reactor Behavior Ankita Majumder
A.3	Magnetic Quantum Dots Coupled to Molecular Shuttles for the Detection, Transport and Manipulation of Biomolecules Jenny Dorcéna	B.4	Strontium cobalt ferrite perovskite materials as cathode catalysts for solid oxide fuel cells: Effect of Ce substitution at the A-site Anshuman Fuller
A.4	Structure-based in silico modeling of chemical toxicity Darshan Mehta	B.6	Optimization of Co-based oxidation catalyst in a dual catalyst after-treatment system for lean-burn engines Sreshtha S. Majumdar
A.6	Synthetic Riboswitch-sRNABio-Circuit for Dual Transcript Control by a Ligand Samuel D. Stimple	B.7	Catalytic performance of nanoparticle CeO₂ in ethanol steam reforming reaction Hyuntae Sohn
A.8	Electrohydrodynamic Fabrication of Subunit Anthrax Vaccine Using Acetalated Dextran Microparticles Matthew D. Gallovic	C.1	Surface Freezing of <i>n</i>-octane: Experimental and MD Studies Viraj P. Modak
A.9	Separation of <i>n</i>-butanol by pervaporation using composite PDMS membrane Fangfang Liu	C.2	Microstructure of Aqueous-Alkane Nanodroplets Harshad Pathak
A.10	Enhancing <i>n</i>-butanol production of <i>Clostridium acetobutylicum</i> by knocking out the gene encoding a kinase Mengmeng Xu	C.3	Study of Surfactants using Constrained Sessile Drop Technique Alyssa Robson
B.2	The novel Cal-C process for single-stage removal of CO₂, SO_x and NO_x – experimental studies Niranjani Deshpande	C.4	Synthesis and Optimization of Polymer Micelles formed via Electrospray-Enabled Interfacial Instability Matthew Souva



GRADUATE RESEARCH SYMPOSIUM 2013 POSTER PRESENTATIONS

1:30 – 4:00 PM | Ballroom, The Blackwell Inn

Abstract #	Presentation Title	Abstract #	Presentation Title
D.1	Modeling self-assembly of micelle-encapsulated nanoparticles Sayantan Banerjee	D.10	Graphene Nanopaper Enhanced Thermoplastics Xilian Ouyang
D.2	Molecular Dynamics Simulation of Salt-Doped Microphase Separating Diblock Copolymers Youngmei Seo	E.2	Design of Techno-Eco Networks for Sustainable Systems Varsha Gopalakrishnan
D.3	Modeling the Morphology of Ionenes for Self-Healing Materials Prashant Vijayaraghavan	E.3	All things considered: A theoretical framework for the design of synergistic techno-ecological networks Rebecca Hanes
D.4	CO₂ Assisted Processing of Biocompatible Polymer Blends Hrishikesh Munj	E.5	Confinement behavior of “wet” gas species Sumant Patankar
D.6	Phase Inversion-Assisted Synthesis Of Electrospun Nanoporous Poly-ε-Caprolactone (PCL) Fibers For Protein Adsorption Prateik Singh	F.1	The application of Electrical Capacitance Volume Tomography (ECVT) in multiphase flow system Aining Wang
D.7	An Experimental and Modeling Study of CO₂-Selective Membranes for Syngas Purification Varun Vakharia	F.2	Design and Operation of a Fluidized Bed Hydrator for Steam Reactivation of Calcium Sorbent Alan Wang
D.8	Zeolite/Polymer Composite Membranes for CO₂ Capture from Flue Gas Zi Tong		



GRADUATE RESEARCH SYMPOSIUM 2013

LIST OF ATTENDEES

Attendee Name	Email	Affiliation
Michael Frangiamore	Michael.Frangiamore@arcelormittal.com	ArcelorMittal
Tim Pajk	t.m.pajk@dowcorning.com	DowCorning
Tom Burns	TDBurns@dow.com	Dow Chemical
Doug Bland	DCBland@dow.com	Dow Chemical
Rich Brandon	RHBrandon@dow.com	Dow Chemical
Susan Hennessey	Susan.M.Hennessey@dupont.com	DuPont
Brian Hogg	brian.d.hogg@exxonmobil.com	ExxonMobil
Dave Arters	David.Arters@lubrizol.com	Lubrizol
Beau Billet	bbillet@metss.com	Metss
He Bai	he.bai@momentive.com	Momentive
Ben Barszcz	Ben.Barszcz@owenscorning.com	OwensCorning
Carmen Latorre	Carmen.LaTorre@owenscorning.com	OwensCorning
Bruno Lecerf	BLecerf@slb.com	Schlumberger
Ellen Silva	Ellen.Silva@genmills.com	General Mills
Jin Huang	jinhuang2004@gmail.com	OSIsoft
Dan Lamone	lamone@entrotech.com	Entrotech
Andy Strange	strange@entrotech.com	Entrotech
Gary Rawlings	grawlings@techcolumbus.com	TechColumbus
Preshit Gawade	pvgawade@babcock.com	Babcock & Wilcox
Dave Russell	drussell@biomerics.com	Akron Biomaterials
Nihar Phalak	phalak.1@osu.edu	Shell
Ryan Zinn	zinn.7@osu.edu	OSU Corporate and Funding Relations
Sharell Mikesell	mikesell.26@osu.edu	OSU Industry Liaison Office
R. Scott Osborne	osborne.391@osu.edu	OSU CoE research operations
Garth Marshmann	mashmann.1@osu.edu	OSU TCO
S. Michael Camp	camp_1@fisher.osu.edu	OSU Fisher College of Business