Message from the Department Head

After a restful winter break and a busy January, winter has now settled in. The fall semester has been an exciting time in the department and proved to be very busy for all of us. This newsletter reflects the dynamic research and educational activities of our faculty, staff, researchers, visitors and students over the past few months. It is a special privilege for me to recognize all of their hard work. Among the many awards and recognitions described below by our department members, I would like to note that Prof. Kathryn Whitehead was named one of the “Brilliant 10” by Popular Science Magazine. Prof. Ignacio Grossmann and Prof. Neil Donahue were recognized as Highly Cited Researchers by Thomson-Reuters for their top-cited papers. In addition, Prof. Ignacio Grossmann was awarded an honorary doctorate from the University of Cantabria in Santander, Spain. Moreover, he and his team won Best Paper of 2014 Award from the Computers and Chemical Engineering journal.

The past semester was also marked with several key events. The semi-annual meeting of the EWO Project took place at the end of September and welcomed industrial representatives active in process systems engineering. October saw a very lively CHEGSA symposium for our PhD students. In addition to showcasing graduate research in the department, we were also pleased to welcome Prof. Norm Wagner, a distinguished CMU alumnus, as our keynote speaker. Moreover, in November our department was strongly represented at the Annual AIChE Meeting in Salt Lake City, with over 70 technical and research presentations by our faculty and graduate students. In particular, it was a great pleasure to reconnect with alumni and friends at the CMU reception.

Among the many student awards at the AIChE meeting, I was very glad that our ChemE Car Competition team distinguished themselves at the Annual Student Conference. They took home the award for the best use of biological reactions to power the vehicle. Moreover, we are very proud that our undergraduate Berg Scholars represented us in the AIChE Undergraduate Poster Competition and won a number of awards. Congratulations especially to Himali Ranade (1st place), Alexandra Cerny (2nd place) and Muyuan Li and Matt Palmer (honorable mentions).

Finally, I am pleased to welcome 10 new visiting researchers to our department. As described below, new research projects are starting for 35 MS and 13 PhD students, who entered last fall. In addition, two students defended their PhD theses, 20 passed their PhD proposals, and 14 passed their PhD qualifying exams and our masters program graduated 49 students in December.
And we especially look forward to congratulating our senior class in May. Much more information on our activities is described below.

Have a great semester!

Larry

Department News

Pictured above are Ignacio Grossman (CMU), John Wassick (Dow), Iiro Harjunkoski (ABB), Pedro Castro (Univ. of Lisbon) and Carlos Mendez (INTEC, Argentina), the co-authors of “Scope for Industrial Applications of Production Scheduling Models and Solution Methods,” which won the 2014 Best Paper Award from the Computers and Chemical Engineering Journal. The award was presented to them at the AIChE meeting in November 2015, but all of the authors were present in our department for the Enterprise-Wide Optimization meeting held in October of that year. Other co-authors of the paper are Peter Bongers, Sebastian Engell, John Hooker, Christos Maravelias, and Guido Sand.

Reuters has issued a publication called “The World’s Most Influential Scientific Minds” and both Neil Donahue (listed in the field of Geosciences) and Ignacio Grossmann (listed in the field of Computer Science) were recognized as Highly Cited Researchers based on their respective output of top-cited papers in their fields. Covering an 11-year period, this publication features researchers who have won acclaim and approval among their peers.
Katie Whitehead was named one of "The Brilliant 10" by Popular Science Magazine in October 2015 (picture below, printed from that issue). This story "honors the brightest young minds reshaping science, engineering and the world."

---

**Staff News**

Congratulations to Larry Hayhurst who received an award for 15 years of service at the CIT staff awards ceremony and luncheon, which was held on January 22, 2016.

In December 2015 the department hosted a Holiday Kick-Off party in the Rothfus Lab. Entertainment was provided by a group of students from the School of Music. In addition, grad student Qin Gu won the Ugly Sweater Contest, with second and third place prizes going to staff members Shirley Pavlischak and Alice Yochum, respectively.
-**Kris Dahl.** Kris has been cited as one of the scientists in CIT’s World Cancer Day presentation because of her work in studying how to stiffen the nucleus of cancer cells to stop their metastatic potential. Kris spoke at the NIH/NCI Physical Sciences Oncology Symposium in February 2016.

-**Ignacio Grossmann.** Ignacio has been granted an honorary Doctorate (Doctor Honoris Causa) at the University of Cantabria in Santander, Spain. He was honored for the excellence of his research work and his international impact in the field of chemical engineering.

Ignacio delivered the lecture “Role of Process Systems Engineering in Chemical Engineering” at the KAIST CBE Global Distinguished Lecture in Daejon, Korea in November 2015, as well as at the Tsinghua Forum Award of Chemical Engineering in Beijing, China in January 2016.

In addition, in February 2016 Ignacio gave the Distinguished McFerrin Lecture at Texas A&M University, entitled “Recent Advances in Computational Models for the Discrete and Continuous Optimization Models of Industrial Process Systems,” with several references to applications in the oil and gas industry.

-**Aditya Khair.** Aditya gave a talk entitled “Changes, Forces and Particles in Ionic Liquids” at the Kaufman Foundation symposium, held in Pittsburgh in September 2015.

-**Nick Sahinidis.** Since its publication in 2013, “Derivative-Free Optimization: A Review of Algorithms and Comparison of Software,” a paper written by Nick and his former post-doc Miguel Rios in the *Journal of Global Optimization*, has become the most-cited paper published in the journal since 2010 and was the most downloaded article in 2014.

-**Bob Tilton.** In December, 2015 Bob delivered a seminar on “Interfacial Properties and Applications of Nanoparticulate Polymer Brushes” at the Danish Technical University in Denmark as well as a seminar entitled “A Surface Chemistry Strategy to Improve Dosage Uniformity for Aerosol Medicines in Partially Obstructed Lungs” at the University of Copenhagen Faculty of Health & Medical Sciences.

-**Lynn Walker** Lynn was the recipient of the 2015 AIChE Woman’s Initiatives Committee (WIC) Mentorship Award. This award recognizes her efforts in promoting the entry, development and participation of women within AIChE and the profession of chemical engineering.

In addition, Lynn presented an invited paper at the Nanoparticle Assembly Faraday Discussion organized the Royal Society of Chemistry in Mumbai, India. The talk discussed anomalous transport in nanostructured soft materials.

-**Katie Whitehead.** Katie has been cited as one the scientists in CIT’s World Cancer Day presentation due to her work with developing tiny particles called siRNA-loaded lipid nanoparticles which selectively enter and destroy lymphoma cells.
Conferences

The semi-annual meeting of the Enterprise-wide Optimization (EWO) Project took place in our department on September 30-October 1, 2015. The first day of the meeting was devoted to presentations of the current 16 EWO projects together with a poster session presented by students and researchers. The second day was devoted to industrial presentations which were given by representatives of Aurubis (new company that has joined CAPD), ABB, Air Products, Dow, ExxonMobil, Praxair, and Total. These talks were followed by a discussion on industrial experience that highlighted the challenges in selling optimization models under uncertainty and followed by a presentation on lessons learned from these projects.

Welcome Visiting Scholars

Andrew Lee of NETL, Weifeng Chen from Zhejiang University of Technology, Nelia Jurado Pontes of Cranfield University, and Michael Short of University of Capetown are working with Larry Biegler’s group.

Penglin Ye, formerly of CMU, is working with Neil Donahue’s group.

Petro Kondratyuk, formerly of CMU, is working with Andy Gellman’s group.

Ines Portugal of CMU-Portugal is working with Ignacio Grossmann’s group.

Jeon Minhyon of Inje University is working with Myung Jhon’s group.

Nikolaos Ploskas of University of Informatics is working with Nick Sahinidis’ group.

Zahra Eghtesadi of Queen’s University is working with Erik Ydstie’s group.

Undergraduate News

Chemical Engineering held an Open House “Mix and Mingle” on January 29, 2016 for CIT freshmen in order to help them with their major declaration. The students were welcomed by Larry Biegler, who gave a quick overview of the department, then attended a poster session and a department tour, and ended the event with a pizza dinner.

Major declarations will occur on March 21, 2106.
An undergraduate research symposium poster session was held in September 2015 to select the Berg Scholars to represent our department in the AIChE Undergraduate Student Poster Competition. Junior Alexandra Cerny and Sophomore Himali Ranade (pictured at right) were chosen for the travel award, and honorable mentions went to Senior Muyuan Li and Sophomore Matt Palmer.

Congratulations to Himali Ranade, who won first place at the National AIChE competition for her project titled “siRNA Loaded Lipidoid Nanoparticles for the Treatment of Diabetic Foot Ulcers and Chronic Inflammatory States” and to Alexandra Cerny, who won second place for her project titled “Integration of Cellular Structures Modulate Motility and Response to Applied Force.”

CMU’s Chemical Car team (pictured here at the Mid-Atlantic Competition) composed of CIT undergrad students Xavier Artache, Palak Bajaj, Jon Berman, Akindele Davies, Alex Frankel, Chris Kim, Josh Kubiak, Andria Lemus, Julia Napolitano, Alec Peterson, Vishnu Razdan, Jonathan Roppo, and Max Vachon, competed at the AIChE National Conference in Salt Lake City, UT in November, 2015. Thanks to the innovative design of their car’s engine and stopping mechanism, the team took home the award for best use of a biological reaction to power the car.

The team was advised by Prof. Aditya Khair, along with ChemE grad students John Michael and Alex Bertuccio.
Senior Maggie Chen has been named a 2016 Andrew Carnegie Scholar. The Andrew Carnegie Society Scholars are chosen by their deans or department heads to represent their class in high standards of academic excellence, volunteerism, leadership and involvement in student organizations, athletics or the arts. Shelly Anna is her advisor.

Chemical Engineering senior and Jamaican native Adam Simpson was awarded a 2015 German Academic Exchange Service's Research Internship in Science and Engineering (DAAD RISE) which enabled him to participate in groundbreaking protein engineering research with Prof. Frank Sonnichsen at Christiana Albertina University in Kiel, Germany. Simpson hopes to use this knowledge in his water research involving a sustainable, low-cost denitrifying process. The ultimate goal of Simpson's work is to make the wetlands of Jamaica cleaner and its people safer.

His advisor in Chemical Engineering is Katie Whitehead.

Senior Will French, a starting offensive lineman on CMU’s football team, was named to the Academic All-District football team by the College Sports Information Directors of America in November 2015. When off the field, Will carries a double major in chemical engineering and engineering and public policy and has a 3.63 GPA. He is advised in Chemical Engineering by Neil Donahue.
Congratulations to the following students who were on the CIT Dean’s List for Fall 2015:

**Seniors**
- Corrine Bacigal
- Sumin Baeg
- Jonathan Berman
- Maggie Chen
- Onyenma Enwereji
- Edna Fongod
- James Ham
- Isaac Jones
- Julie Jung
- Jee Yoon Jung
- Eleanor Kwik
- Muyuan Li
- Brigid McGovern
- Alexandra Mod
- Alexandra Newby
- Adam Simpson
- Kira Singhaus
- Brian So
- Zhuopin Sun
- Sun-Young Wang

**Juniors**
- Vishal Ahuja
- Zachary Blonder
- Meave Higgins
- Maya Holay
- Timothy Hui
- Hyo Cheol Jeong
- Dianna Li
- Jordyn Lopez
- Rinko Maeshima
- Brandon Ortiz
- Gordon Pace
- Alexander Peterson
- Jakob Przybycien
- Lauren Relyea
- Jonathan Roppo
- Adam Somers
- Naomi Sternstein
- Jamei Wang
- Patrick Yang
- Yuxuan Yang

**Sophomores**
- Palak Bajaj
- Jonathan Calvello
- Emily Carvalho
- Eloy Fernandez
- Yuanyuan Fu
- Felicity Gong
- Edward Healy
- Natalie Hong
- Neha Kapate
- Jae Yeon Kim
- Amanda Li
- Velisa Li
- Jennifer Lott
- Nicholas Medich
- Alicia Ng
- Matthew Palmer
- Aakash Parekh
- Megan Pudlo
- Rohan Reddy
- Scott Rohrer
- Shridhar Singh
- Hua Zhi Situ
- Cameron Smith
- Kevin Steinhouse
- Charles Webb
- Alisandra Welch
- Roxana Wolfson
- Michelle Wu
- Yilin Yang
- Mengxi Yang
- Yongyi Zhao
- Sally Zhao
**Exchange Students**

Welcome to Hridayarth Sattineni and Qi Hui (Hannah) Lau, our new exchange students from Imperial College; and to Caroline Ganzer, Fabian Mohr and Laura Astrid Mey from RWTH Aachen.

Best wishes to our students Vikram Cherupally, Samantha Ho, Mariah Richardson and Andrew Zheng, who are studying at Imperial College and Anna Hoar who is studying at RWTH Aachen.

**Graduate News**

Welcome to the following students who have joined our graduate program:

Ph.D. Student: Elif Erdinc from Bogazici University
M.S. Students: Yu-Chen Hsu from National Cheng Kung University, Jacob Kupas from Case Western Reserve University and Christopher Sierka from Indiana University of Pennsylvania.

Good luck to our first-year graduate students who have joined the following professors in their research efforts:

<table>
<thead>
<tr>
<th>M.S. Students</th>
<th>Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faisal Ali</td>
<td>C. Bettinger</td>
</tr>
<tr>
<td>Nikhil Apte</td>
<td>C. Gounaris</td>
</tr>
<tr>
<td>Pooja Bhalode</td>
<td>L. Biegler</td>
</tr>
<tr>
<td>Tianyu Gao</td>
<td>J. Kitchin</td>
</tr>
<tr>
<td>Gongda Ge</td>
<td>N. Sahinidis</td>
</tr>
<tr>
<td>Feiyang Geng</td>
<td>J. Kitchin</td>
</tr>
<tr>
<td>Bo Li</td>
<td>B.E. Ydstie</td>
</tr>
<tr>
<td>Hejun Li</td>
<td>N. Sahinidis</td>
</tr>
<tr>
<td>Boyuan Liu</td>
<td>S. Anna</td>
</tr>
<tr>
<td>Zehua Lyu</td>
<td>N. Sahinidis</td>
</tr>
<tr>
<td>Teng Ma</td>
<td>J. Kitchin</td>
</tr>
<tr>
<td>Nirmal Mundhada</td>
<td>I. Grossmann</td>
</tr>
<tr>
<td>Sachi Nagada</td>
<td>T. Przybycien &amp; R. Tilton</td>
</tr>
<tr>
<td>Teng Nie</td>
<td>J. Kitchin</td>
</tr>
<tr>
<td>Menglia Qi</td>
<td>B.E. Ydstie</td>
</tr>
<tr>
<td>Bhavana Rao</td>
<td>N. Sahinidis</td>
</tr>
<tr>
<td>Misna Sameer</td>
<td>C. Gounaris</td>
</tr>
<tr>
<td>Akshara Shetty</td>
<td>L. Walker</td>
</tr>
<tr>
<td>Han Shui</td>
<td>B.E. Ydstie</td>
</tr>
<tr>
<td>Yingkai Song</td>
<td>L. Biegler &amp; I. Grossmann</td>
</tr>
<tr>
<td>Akshay Tharval</td>
<td>J. Kitchin</td>
</tr>
<tr>
<td>John Villaraga</td>
<td>N. Sahinidis</td>
</tr>
<tr>
<td>Devon Walker</td>
<td>J. Kitchin</td>
</tr>
<tr>
<td>Chen Wang</td>
<td>J. Kitchin</td>
</tr>
<tr>
<td>Haoren Wen</td>
<td>B.E. Ydstie</td>
</tr>
<tr>
<td>Wenjie Wu</td>
<td>R. Tilton</td>
</tr>
<tr>
<td>Yimu Yang</td>
<td>B.E. Ydstie</td>
</tr>
</tbody>
</table>
ChEMSA 2016 officers

President: Akshay Tharval
Vice President: Faisal Ali
Social Chairs: Akshara Shetty, John Villaraga
Finance Chair: David Yao
Academic Chair: Sachi Nagada
Communication Chair: Han Shui
Technical Chair: Yingkai Song

ChEMSA celebrated the year of the Monkey by hosting the Chinese New Year in the department in February 2016. Both M.S. and Ph.D. students enjoyed a variety of Chinese delicacies at the event.

ChEGSA 2016 officers

President: Toni Bechtel
Vice President: Nick Lamson
Symposium Chairs: Rebecca Ball, Alex Bertuccio, Qin Gu
Social Chairs: Kerrigan Cain, Marissa Engle, Kathy Fein, Dana McGuffin, Ben Sauk, Bruce Yan
Webmaster: Rob Apap
GSA reps: Qi Chen, Naser Mahfouz, and Kal Hajj (Alternate)
Fundraising Chair: Brittany Nordmark
Outreach Coordinator: Charles Sharkey

The 37th Annual ChEGSA Symposium, chaired by students Jake Boes, Stephanie Kirby and Justin Weinberg, was held on October 22-23, 2015. The event was kicked off with the Dow Chemical Company Keynote Address, given by Dr. Norman J. Wagner, the Robert L. Pigford Chair of Chemical Engineering in the Department of Chemical and Biomolecular Engineering at the University of Delaware (and Carnegie Mellon Alum), titled “The micromechanics of shear thickening fluids and their applications as field-responsive protective materials and shielding for spacecraft and astronauts.” The 2015 symposium featured 27 student presenters who addressed nearly a dozen industry representatives from various companies.
The Symposium Awards went to Blake Bleier and Amy Stetten, with honorable mentions going to Benjamin Yezer and Javier Lanauze. The Geoffrey D. Parfitt Memorial Award was given to Qi Zhang, and the Gary Powers Poster Award went to Khalid Hajj.

Pictured below are Jake Boes, Stephanie Kirby, Justin Weinberg and Khalid Hajj.

Congratulations and good luck to our students who graduated in Fall 2015:

**PhD**

**Pablo Garcia Herreros - PhD**

Advisor: I. Grossmann. Title: “Supply Chain Optimization with Uncertainty and Hierarchical Decision-Makers”

**Francisco Trespalacios - PhD**

Advisor: I. Grossmann. Title: “Improved Formulations and Computational Strategies for the Solution of Convex and Nonconvex Generalized Disjunctive Programs”
Pictured above are some graduates and faculty celebrating at the MS/MChE Masters Student Graduation reception held at McCormick & Schmick’s on December 15, 2015.

**MS**

**Sumedh Beknalkar – MS**
Advisor: A. Khair. Title: “Computational Study of Locomotion of a 2D Squirmer Across Reynolds Numbers”

**Atharv Bhosekar – MS**
Advisor: B.E. Ydstie. Title: “Analysis and Modification to Adaptive Control Based on the MIT Rule”

**Moiz Bohra – MS**
Advisor: M. Mauter. Title: “Water Production Capacity of Power Plant Waste Heat Driven Thermal Desalination Processes”

**Zhaofeng Chen – MS**
Advisor: J. Kitchin. Title: “Research on Oxygen Atoms Spillover on Single Atom Alloys”

**Zihao Chen – MS**
Advisor: M. Jhon. Title: “Optimization of PEMFC Cathodes with an Agglomerate Model”

**Ananya Chowdhury - MS**
Advisor: N. Sahinidis Title: “Modeling, Simulation and Derivative-Free Optimization of Lithium-Ion Batteries”

**Lisa D’Costa – MS**
Advisors: S. Anna, L. Walker. Title: “Adsorption Dynamics and Mechanics of Silica-CTAB Complexes at Air-Water Interfaces”

**Yulong Deng – MS**
Advisor: B.E. Ydstie. Title: “Stability Analysis of Multi-Phase Flash and Azeotropic Distillation Systems”

**Siddharth Deshpande – MS**

Advisor: J. Kitchin. Title: “Quantifying Uncertainty in Activity Volcano Relationships for Oxygen Reduction Reaction”

**Kanishka Ghosh – MS**

Advisor: C. Gounaris. Title: “A Variable Neighborhood Search Metaheuristic for the Double Traveling Salesman Problem with Multiple Stacks”

**Yunli Han - MS**

Advisor: N. Sahinidis. Title: "Effect of Low Discrepancy Sequence in ALAMO: Hammersley and Halton Sequence"

**Arpita Iddya - MS**

Advisor: M. Mauter. Title: “Modeling of Convective and Diffusive Mass Transport in Capacitive Detonation Electrodes”

**Anushree Kamat – MS**

Advisor: C. Gounaris. Title: “Exact Solutions to Double Traveling Salesman Problem with Multiple Stacks”

**Keshav Kasturi Rangan – MS**

Advisor: B.E. Ydstie. Title: “Analysis and Modification to Adaptive Control Based on the MIT Rule”

**Xiangying Liao – MS**

Advisor: R. Tilton. Title: “Research on SDS Surface Tension Effect to Guar Gum Solution”

**Siyu Liu – MS**

Advisor: N. Sahinidis. Title: “Effect of Low Discrepancy Sequence (Sobol Sequence) in ALAMO”

**Vatsal Modi – MS**

Advisor: C. Gounaris. Title: "Comparison of Mathematical Models for Process Scheduling Optimization"

**Venkatesh Naik - MS**

Advisor: J. Kitchin. Title: “Speciation of Carbon Dioxide in Alkaline and Amine-Containing Solvents Using Raman Spectroscopy”

**Tapas Peshin – MS**

Advisor: N. Sahinidis. Title: “Crude Oil Price and Dow Jones Industrial Average Forecasting Using Machine Learning”

**Nandini Ramachandran - MS**

Advisor: B.E. Ydstie. Title: “System Identification using Closed Loop Data”

**Samji Samira – MS**

Advisors: A. Gellman, J. Miller. Title: “Kinetics of Cyclohexene Hydrogenation on Pd based Alloys”
Sreejith Sasidharan – MS  
Advisor: S. Pandis. Title: “Evaluation of a Three-dimensional Chemical Transport Model (PMCAMx) in the Continental US for 2008”

Aditya Sinha – MS  
Advisor: N. Donahue. Title: “Development of Calibration Mixtures of Organics for Volatility Determination”

Kanika Suri – MS  
Advisor: K. Whitehead. Title: “Modulating Intestinal Permeability using Bioactive Natural Products”

Kashish Tayal – MS  
Advisor: C. Gounaris. Title: “Network Design using Mixed-Integer Linear Optimization”

Hari Thirumalai – MS  

Kinshuk Verma – MS  
Advisor: I. Grossmann. Title: “Integration of Reservoir Data with Oil field Planning and Infrastructure Optimization”

Yuyu Yao – MS  
Advisor: B.E. Ydstie. Title: “Application of Model Predictive Control to a Fiberglass Process”

Mingkai Zhang – MS  
Advisor: R. Tilton. Title: “Transport of Engineered Nanoparticles”

Yupeng Zhao – MS  
Advisor: M. Mauter. Title: “Membrane Characteristics Comparison for Phase Inversion Membrane, Electrospun Membrane and Track Etched Membrane”

MS-CPS

Karan Bhangaonkar – MS  
Advisor: K. Matyjaszewski. Title: “Magnesium Hydroxide and Alumina based Hybrid Materials Using SI-ATRP”

Zhao Lu – MS  
Advisor: M. Bockstaller. Title: “Characterization of the Role of Surface Chemistry on the Optical & Thermal Properties of Particle-filled Polymers”

Nikhil Malhotra – MS  
Advisor: K. Matyjaszewski. Title: “Photo induced Atom Transfer Radical Polymerization (ATRP)”

MS - Chemical Engineering and CPS

Zhiyuan Cheng – MS
Advisor: B.E. Ydstie. Title: "Modeling and Control System of Fiber Glass Process"

**Bhagyashree Lele – MS**
Advisor: R. Tilton. Title: “Stabilization of Colloidal Suspension by Polyelectrolyte Brush Grafted and Star Polymer Nanoparticles”

**Haichao Wu – MS**
Advisors: R. Tilton, T. Przybycien, S. Garoff. Title: “Marangoni Driven Dewetting of Thin Liquid Layers in a Cylinder”

**Master of Chemical Engineering**

Mengyuan Chen  
Zezhen Cheng  
Khalid Hajj  
Jianfeng Liu  
Wenyang Lu  
Sarah Narburgh  
Malavika Thottappillil  
Krithiknath Tirupapuliyr  
Meng-Ting Tsai  
Kang Wu  
Zonglin Yang  
Andrew Yee  
Zuo Zeng

Congratulations to the following students who recently presented their research proposals:

**Travis Armiger**

**Rebecca Ball**
Advisor: K. Whitehead. Title: “RNA Interference Therapy using Lipidoid Nanoparticles for the Treatment of Epithelial Diseases”

**Toni Bechtel**
Advisor: A. Khair. Title: “Novel Framework for Predicting Stress Response of Complex Fluids in Transient, Large Amplitude Flows”

**Alex Bertuccio**
Advisor: R. Tilton. Title: “Characterizing Environmental Conditions that Influence Nanoparticle Transport”

**Blake Bleier**
Advisors: S. Anna, L. Walker. Title: “Continuous Solvent Removal in Microscale Droplets to Quantify Mechanics and Phase Behavior of Colloid Polymer Mixtures”
Markus Drouven
Advisor: I. Grossmann. Title: "Mixed-Integer Optimization Models for Shale Gas Development"

John Eason
Advisor: L. Biegler. Title: "Reduced Model Methods for Optimization of Hybrid Glass Box / Black Box Systems"

Randall Gamble
Advisor: J. Schneider. Title: “Characterization of Micelle ELFSE Buffers for Rapid Kilobase DNA Separations”

Devin Griffith
Advisor: L. Biegler. Title: "Robust and Easily Implemented eNMPC"

Lisa Kasiewicz

Jiaying Ke
Advisor: B.E. Ydstie. Title: "Modeling and Stability Analysis of the Horizontal Ribbon Growth Process"

Nikolaos Lappas
Advisor: C. Gounaris. Title: "Multistage Adjustable Robust Optimization Framework for Process Scheduling under Uncertainty"

Juan Morinelly
Advisor: B.E. Ydstie. Title: “Adaptive Dual Model Predictive Control Applied to Enhanced Oil Recovery"

Brittany Nordmark
Advisors: R. Tilton, T. Przybycien. Title: "Novel Grafted Bio-flocculants Comprised of Moringa oleifera Cationic Proteins and Polysaccharide"

Sreekanth Rajagopalan
Advisor: N. Sahinidis. Title: "Systematic Approaches to Turnaround Planning for a Network of Integrated Chemical Sites under Uncertainty"

Irem Sen
Advisor: A. Gellman. Title: “High Throughput Study of Catalysis on Pd-based Alloys"

Anirudh Subramanyam
Advisor: C. Gounaris. Title: “Robust Optimization of Vehicle Routing Problems Under Uncertainty"

Justin Weinberg
Advisor: T. Przybycien. Title: “Improving the Selectivity and Stability of Affinity Chromatography with PEGylated Ligands”

Zachary Wilson
Advisor: N. Sahinidis. Title: “Optimization Based Approaches to Model Selection in Linear and Nonlinear Regression”

Xiaoxiao Yu
Advisor: A. Gellman. Title: “High Throughput Assessment of Multicomponent Alloy Materials”

Congratulations to our second year Ph.D. students who passed their qualifier exams:

Braulio Brunaud  Steven Iasella
Soham Dutta  Burcu Karagoz
Pablo Garcia  Sasimas Katanyutanon
Qin Gu  Nicholas Lamson
Khalid Hajj  Cristiana Lara
Chris Hanselman  Yajun Wang
Yun-Ru Huang  Zixi Zhao

Congratulations to:

--PhD candidate Nikolaos Lappas has been awarded the Adnreas Mentzelopoulos Fellowship

--PhD candidate Travis Arminger was awarded the BiRM (Biomechanics in Regenerative Medicine) Training Program Fellowship.

--PhD candidate Qi Chen won the Presidential Fellowship in the College of Engineering.

--PhD candidates Anirudh Subramanyam and Christopher Knapp were awarded the Bertucci Graduate Fellowships.

--PhD candidates were awarded the following departmental fellowships:

Brittany Nordmark  Mahmood I.Bhatta Fellowship
Randall Gamble  Gulf Oil Fellowship
Yash Puranik  James C. Meade Fellowship
Rajarshi Sengupta  John E. Swearingen Fellowship
Zhongnan Xu  Dighe Fellowship
Wonyup Song  H. William and Ruth Hamilton Prengle Graduate Fellowship
Melissa Dao  Robert R. Rothfus Graduate Fellowship
Alumni News

Carnegie Mellon University trustee Jonathan Rothberg (ChemE ’85), whose groundbreaking work on DNA sequencing greatly increased the speed and efficiency of genome analysis, will receive the National Medal of Technology and Innovation, the White House announced on December 22.

The medal is the nation’s highest honor for achievement and leadership in advancing the fields of science and technology. The award recognizes those who have made lasting contributions to America’s competitiveness and quality of life, and helped strengthen the nation’s technological workforce.

Rothberg is one of seven winners of the medal, which will be awarded at a White House ceremony early this year.

Lalit Chordia (ChemE’85), President & CEO of Thar Energy, was elected to the American Association for the Advancement of Science in honor of his outstanding contributions leading to innovations of supercritical fluid technologies and for championing the widespread use of these technologies.

Marvi Matos (ChemE’06) of Boeing Research and Technology won the “Most Promising Engineer or Scientist (Advanced Degree)” award from the Hispanic Engineering National Achievement Awards Conference.
JitKang Lim (PhD, ChemE ‘09) has received the Promising Academician Award of the Malaysian Ministry of Higher Education. Dr. Lim is an Associate Professor of Chemical Engineering at the Universiti Sains Malaysia. An expert in nanomaterials, Dr. Lim had been honored in 2014 with the National Young Scientist Award of the Malaysian Ministry of Science, Technology and Innovation, and is the first person in Malaysia to receive both honors. While at Carnegie Mellon, JitKang Lim’s PhD research was co-advised by Chemical Engineering Professor Bob Tilton and Physics Professor Sara Majetich.

Michael Molnar (ChemE ‘95), Associate Process Engineering Scientist, Dow Corning Corporation, was recently selected by the National Academy of Engineering (NAE) to participate at the 2015 China-America Frontiers of Engineering Symposium (CAFOE).

In Michael’s current role within Dow Corning Corporation, he supports multiple Dow Corning product lines in the areas of reaction engineering, process thermodynamics and flow sheet analysis, and pilot plant best practices for technology development. He is a recipient of two (2) Dow Corning technical achievement awards and is a recognized inventor with seven (7) granted patent families.

Il Moon (ChemE ’92) was recently appointed as director of the National Science and Engineering Programs in NRF (National Research Foundation of Korea). In addition to that, he received an award from the President of South Korea, based on his LNG research and excellence in education.
Jaime Cerda (ChemE ’80), Professor of Chemical Engineering at the Universidad Nacional del Litoral and Superior Researcher at the Argentine National Scientific and Technical Research Council (CONICET), has been named recipient of the prestigious 2015 Recognition Award in Engineering from the National Academy of Science in Argentina in recognition of his contributions in the area of Process Systems Engineering.

Ester Marie Barbuto (ChemE ’08) of Booz Allen Hamilton, who is currently an MBA candidate at the University of Virginia, was named a “Distinguished New Engineer” by the Society of Women Engineers.

Michelle O’Malley (Chem, Biomed ’04), who is currently an Assistant Professor at the University of California, Santa Barbara, will receive the Presidential early Career Award for Scientists and Engineers (PECASE). The award is the highest honor the nation can bestow on a scientist or engineer at the beginning of his or her career.

**Spring 2016**

*Chemical Engineering Seminar Series*

**Tuesday, February 9, 2016**

*Professor Vanessa Ortiz*

Assistant Professor Chemical Engineering
Columbia University

“Towards an Understanding of Signal Propagation and Conformational Changes in Allosteric Proteins”
Thursday, March 3, 2016
Professor Thomas Adams
Assistant Professor Chemical Engineering
McMaster University
“Semicontinuous Distillation Systems”

Thursday, March 24, 2016
Professor Nasser Abukhdeir
Assistant Professor of Chemical Engineering
University of Waterloo
“Device-scale Simulation of Liquid Crystal Reorientation Dynamics”

Thursday, March 31, 2016
Dr. Gavin Towler
VP and Chief Technology Officer
Honeywell Performance Materials and Technologies
“Frontiers in Hydrocarbon Processing”

Tuesday, April 5, 2016
Professor Yuriy Roman
Associate Professor of Chemical Engineering
Massachusetts Institute of Technology
Title TBA

Thursday, April 14, 2016
Professor Roger Bonnecaze
William and Bettye Nowlin Chair in the McKetta Department of Chemical Engineering
University of Texas at Austin
“Unit Operations of Nanomanufacturing”

Save the Date—Upcoming Events

The CAPD Annual Review Meeting will take place on Monday and Tuesday, March 7-8, 2016 here at CMU. This will be preceded by a meeting of the special interest group on Energy Systems Initiatives (ESI) on Sunday, March 6 and followed by the meeting of the special group on Enterprise-wide Optimization (EWO) on Wednesday, March 9, 2016.
The CAPD short course, Conceptual Design, Optimization Modeling and Integrated Process Operations is scheduled to take place on May 4-11, 2016 here at CMU. The short course will be organized in 7 modules that can be taken in any combination (e.g., 1, 2 & 3, or all 7).

http://capd.cheme.cmu.edu/shortcourse/index.html

Graduate Recruiting weekends will be held on March 5, 18 and 25.

Spring Carnival will take place on April 14-16, 2016. ChemE is hosting an Alumni, Faculty & Student Mixer on Friday, April 15 at 3:00 pm in the Rothfus Lab, followed by the ChEGSA Wine & Cheese Happy Hour at 4:30 pm in the Grad Student Lounge. Due to construction this year, the midway events will be located on the College of Fine Arts parking lot, lawn and the Mall.

Carnegie Mellon's commencement will take place at 11am on Sunday, May 15th in Gesling Stadium (rain or shine). The procession of candidates across campus will begin at 10:15am. Guests are asked to be seated in the stadium by 10am. The ceremony will begin at 11am and last about 90 minutes.

The Chemical Engineering Department ceremony will take place at noon on Saturday, May 14th in the Weigand Gym, Cohon University Center. After the ceremony, a special reception will be held at the Tartans Pavilion, Resnik House for graduates and their guests. Tickets are not issued or required.

The Doctor’s hooding ceremony will take place at 4:30pm on Saturday, May 14th at the Carnegie Museum, 4400 Forbes Avenue. Doctor's candidates, participating faculty and other ceremony participants will robe in the Carnegie Music Hall Foyer, Carnegie Museum at 3:30pm. The ceremony will last approximately 90 minutes. Doors will open at 3:30pm and seating is first come, first served. A reception will immediately follow in the Carnegie Music Hall Foyer.

Be sure to follow the schedule of events and latest news at the commencement web site http://www.cmu.edu/commencement/event/hooding.html.

Social Media

Follow us on TWITTER: Twitter.com/CMU Chemical Eng. (@CMU_ChemE)

Like us on FACEBOOK: facebook.com/Carnegie Mellon Chemical Engineering

Subscribe to us on YOUTUBE for current updates: www.youtube.com/used/CMUEngineering

Watch the following:

Webinar with Carnegie Mellon University BERGES and GROSSMANN https://www.youtube.com/watch?v=nPwvJAYybNA

What I Learned at Carnegie Mellon University MICHELLE RUIZ https://www.youtube.com/watch?v=fX3_xPwNQKo
Carnegie Mellon University Chem-E-Car in the Spotlight 2015 Annual Student Conference
AICHE STUDENT SECTION https://www.youtube.com/watch?v=l2cIfrWsHP8

Meet an Intern: Isaiah, Chemical Engineering intern from Carnegie Mellon
CORNING: https://www.youtube.com/watch?v=C2GH6Hxz_Gc