

THE CHEME NEWS

Fall / 2013

Internal Newsletter of the Department of Chemical Engineering
Carnegie Mellon University

Message from the Department Head

I had assumed that my last message from the DH would be my last message from the DH, but instead, this will be my last message from the DH. No need to reiterate previous thoughts and commentary on that topic.

Even in the last months of my term we have had the opportunity to make a few changes to the department that I expect to have lasting impact. First, I would like to welcome Dave DeLo and Toni McIltrout into their new roles as Director of Staff and Financial Operations and Director of Communications Advancement and Events, respectively. And also to thank them both for the great things that they have done for the department in their previous roles. We are also in the process of defining two new positions that I hope we will have filled over the next month or so.

Welcome also to Professor Chrysanthos Gounaris who joined us as Assistant Professor at the end of the summer from Princeton University. And welcome also to those of you who are new students in Chemical Engineering: sophomores, MS and PhD students alike. I hope that you have settled into the department and into Pittsburgh life.

Below you will read about some of the other events and news of the department that occurred over the summer and the first few weeks of the semester. In particular, we have dedicated a new educational computer lab to the memory of Professor Gary Powers. Those of you who did not get to meet him will appreciate from the commentary what an extraordinary person he was, both as a friend and as a colleague.

The handoff between Larry and me will occur at midnight on Oct. 31. Unfortunately, neither he nor I will actually be here or be in town, so the handoff will be figurative rather than literal. However, for those of you who are attending the AIChE meeting and the departmental reception on Monday evening, we will both be there. I would be happy to buy you a beer at Larry's expense.

Andy

Department News

Gary J. Powers Educational Computer Lab Dedication



The Powers family: First row: Alex Powers, Susan, Libby Powers, Gabriel Musial, Finnegan Musial, William Musial. Back row: Thomas Musial holding Calvin Musial, Jake Musial, Tom Musial, Becky Powers Musial, Katie Powers Loomis, Rolfe Loomis

The Powers family, alumni, friends, faculty & staff attended the Gary J Powers Educational Computer Lab Dedication that was held on September 27, 2013. The speakers were James H. Garrett, Jr., Dean College of Engineering and Thomas Lord Professor of Civil and Environmental Engineering; Andy Gellman, Head of Chemical Engineering and Lord Professor of Chemical Engineering; Ignacio E. Grossmann, Dean University Professor of Chemical Engineering; Jeffrey J. Siirola, Distinguished Service Professor of Sustainable Energy Systems; Matt Cline, Chemical Engineering Unit Operations Lab Instructor; Dr. Steven A. Lapp, former business partner and President, Design Sciences, Inc.; and Susan Powers, Gary Powers's wife.

As Andy Gellman said, "Gary was an excellent educator and researcher and his dedication for teaching our students the importance of safety and process synthesis and the relevance of chemical engineering was outstanding. He exuded enthusiasm, and he had a unique ability to turn problem-solving into a great educational expedition for students. He started the successful chemical car competition which is ongoing today and he designed creative outreach programs for K-12 students." Joe Witkowski, ChE Class of 1984, now living in St. Louis MO, wrote: "God I wish I could attend...it was such a privilege and a treasure to learn from him. He'll be radiating that infectious smile from heaven and saying 'that's a lot of water!!' or one of his other trademark quips. Thank God for great human beings like Dr. Gary J. Powers. May his memory live on in all the students who learn in HIS lab!" Also please see

<http://www.carnegiemellontoday.com/article.asp?aid=1408> to read the article about Carol Williams, executive vice president of The Dow Chemical Company, to appreciate Carol's comments about Gary Powers, the teacher.

Technical Opportunities Conference (TOC), by Sharon M. Vuong

The annual Technical Opportunities Conference (TOC) is a highly anticipated event, growing in the number of corporate and student attendees each year. Sponsored by the Carnegie Institute of Technology (CIT) and organized by the Society of Women Engineers (SWE) section at CMU, the TOC is a two-day career fair that also includes departmental networking breakfasts with select company representatives and additional networking sessions hosted by various campus organizations. This year's event occurred on September 17th and 18th at the University Center in the Weigand Gymnasium and Rangos Ballroom. The TOC is an opportunity for not only students to find internships, co-ops and full-time jobs, but is also a time for companies to connect with students on campus and build relationships that continue past the career fair. The Chemical Engineering Department at CMU has a strong presence during these two days, with alumni coming back to recruit as well as current students volunteering during the event to raise money for their respective organizations. The CMU SWE section would like to thank the following chemical engineering students for their time in making the TOC a success this year: **Melissa Day, Alisa de Bruyn Kops, Danny Sogunro, Erica Trump, Sharon Vuong, and Lei Wang.**

CAPD News:

The Annual Review Meeting of the CAPD (<http://capd.cheme.cmu.edu>) took place on March 11-12, 2013. It was preceded by the meeting of the Energy Systems Initiative group on March 10, and followed by the meeting of the group on Enterprise-wide Optimization on March 13. There were a total of 44 participants from 18 companies (ABB, Air Liquide, Air Products, Braskem, NETL, Dow, Eastman, ExxonMobil, GAMS, Mitsubishi Electric, Neste Engineering, Paragon-AIMMS, Petrobras, Praxair, P&G, Rockwell Automation, SASOL, and Unilever).

Faculty News

Larry Biegler has been appointed as Head of the Chemical Engineering Department effective November 1, 2013. He replaces Andy Gellman, who has been Department Head since January, 2003. Larry holds a B.S. (1977) from the Illinois Institute of Technology and M.S. (1979) and Ph.D. (1981) degrees from the University of Wisconsin, all in Chemical Engineering. Larry is in his 32nd year as a member of the ChE faculty, starting as an assistant professor in 1981 and advancing through academic ranks to his current appointment as the Bayer Professor of Chemical Engineering. He was also Director of the Center for Advanced Process Decision-making from 1999-2005. In 2011, Larry was elected as a University Professor, the highest academic rank at Carnegie Mellon. Larry was also elected to the National Academy of Engineering in 2013. He is a Fellow of the American Institute of Chemical Engineers, and is the recipient of numerous awards including the Lewis Award, McAfee Award (Pittsburgh Section) and the Computers in Chemical Engineering Award, all given by AIChE; the Curtis McGraw Research Award and CACHE Computing Award, given by ASEE; the INFORMS Computing

Prize, and an honorary doctorate in engineering sciences (Dr.-Ing. e.h.) from the Technical University of Berlin. All the faculty are looking forward to Larry's headship.

In the spring, **Larry Biegler** participated in two reviewer panels for the German National Science Foundation (DFG) on Feb. 24-28, 2013 (in Kloster Banz) and April 11 (in Bonn). He also presented two seminars, one on "Multi-scale Optimization for Integrated Design of Engineering Systems," at ExxonMobil Corporate Research Center, February, 2013, Annandale, NJ and another on "Overview of Reduced Order Modeling Techniques: State of the Art and Challenges," at the CCSI Reduced Order Models Workshop at Lawrence Berkeley National Laboratory. In the summer he presented an invited lecture on "Nonlinear Programming Strategies for Dynamic Chemical Process Optimization," at the International Scientific School on Computer Aided Process System Engineering at Kazan National Research Technological University, Russia. He presented an invited talk entitled "NLP Sensitivity with Direct Transcription: A Strategy to Incorporate Moving Finite Elements within DAE Optimization" at the SIAM Conference on Control and Dynamics in San Diego and two talks entitled "Global Optimization of Optimal Power Flow" and "Sensitivity-based Decomposition for Moving Finite Elements with Direct Transcription Formulations" at the ICCOPT Conference in Lisbon, Portugal. In addition, Larry gave two seminars, one at the Japanese PSE Society Annual meeting in Tokyo and another at the University of Kyoto. Finally, in early August he was the plenary speaker at the Annual Chinese Process Control Conference, Hohhot, Inner Mongolia, and gave a talk entitled "Advanced Algorithms for Nonlinear Model Predictive Control and Dynamic Real-time Optimization."

Neil Donahue has been named the Director of the Steinbrenner Institute for Environmental Education and Research (SEER). Donahue, who joined the faculty in 2000, is an internationally recognized expert in atmospheric chemistry and air-quality engineering. With more than 150 peer-reviewed publications, his research focuses on the behavior of organic compounds in the atmosphere, ranging from fundamental quantum chemistry to the way chemistry forms molecules that stick to particle pollution, such as wood smoke and diesel emissions.

His latest research has focused on chemistry that forms particles literally out of thin air - known as nucleation - as part of an international team called the CLOUD consortium at the nuclear physics laboratory CERN in Geneva, Switzerland. See article at:

http://www.cmu.edu/news/stories/archives/2013/september/sept19_neildonahue.html

In April, **Andy Gellman** attended the Gordon Conference on Chemical Reactions at Surfaces in Les Diablerets, Switzerland where he was elected vice chair of the next GRC to be held in 2016. This summer he gave a keynote lecture at the North American Meeting of the Catalysis Society; participated in the International Symposium on Chiro-optic Spectroscopy; gave an invited presentation at the Gordon Conference on Dynamics at Surfaces in Newport, Rhode Island; and gave an invited talk at the 9th World Congress on Chemical Engineering in Seoul, South Korea. While in Seoul, he visited Yonsei University with whom we have a new undergraduate exchange program.

Chrysanthos Gounaris joined the Department of Chemical Engineering on August 1, 2013. Chrysanthos is a graduate of Princeton University where he worked under the direction of Professor Chris Floudas. His research interests include the efficient modeling and solution of a

number of combinatorially complex problems, such as those arising in the areas of Transportation & Logistics, Networks, Materials Design and Metabolic Engineering. In 2008, Chrysanthos received his Ph.D. in Chemical Engineering from Princeton University. His doctoral thesis was entitled "Advances in Global Optimization and the Rational Design of Shape Selective Separations." Chrysanthos also holds a Diploma in Chemical Engineering (2002), an M.Sc. in Process Control (2003), both from the National Technical University of Athens, Greece, and an M.A. in Chemical Engineering (2005) from Princeton University. Chrysanthos intends to participate in the CAPD with his work on Global Optimization, Vehicle Routing and Microporous Materials.

Ignacio Grossmann. He attended the INFORMS Computing Meeting in Santa Fe, NM, January 6-9, 2013, where he presented the papers "Global Optimization of Mixed-Integer Bilinear Programs with a Multiparametric Disaggregation Technique," and "An Algorithm for Preprocessing and Tightening Generalized Disjunctive Programming Models through the Application of Basic Steps." He then went to the Instituto Tecnológico de Celaya where he taught a short course on mixed-integer programming and enterprise-wide optimization. He was also awarded the Agustin Vazquez Vera Lectureship, for which he gave the talk "Optimal Synthesis and Planning of Sustainable Chemical Processes." He then visited Taiwan where he gave the talk "Challenges in the Application of Mathematical Programming in the Enterprise-wide Optimization of Process Industries" at the National Taiwan University. He also gave the talk "Optimal Synthesis and Planning of Sustainable Chemical Processes" at the PSE Symposium in Hsinchu. In March he gave the seminar "Optimal Synthesis and Planning of Sustainable Chemical Processes" at Drexel University. Next he went to Sweden where he participated in the Process Integration Jubilee in Gothenburg on March 18-20 where he gave the talks "Recent Developments in the Application of Mathematical Programming to Process Integration" and "Role of Process Integration in Process Systems Engineering." On April 22, he gave the seminar "Relaxations for Convex Nonlinear Generalized Disjunctive Programs and their Application to Nonconvex Problems" at Texas Tech University. On April 29-30 he gave the talk "Optimal Synthesis and Planning of Sustainable Chemical Processes," at the Purdue - Mexico Workshop on Sustainability. He then gave the plenary talk "Optimization Models of Water Networks and their Application to Biofuel Processes and Shale Gas Production," at the International Conference on Sustainable Chemical Product and Process Engineering, Dalian, China on May 27-30. He then attended the ESCAPE-23 meeting in Laaperenta, Finland, June 10-12, where he presented the papers "Design of Supply Chains under Risk of Facility Disruptions," "Multiproduct Feedstock Optimization Model for Polymer Production," "Multi-period Synthesis of a Biorefinery's Supply Networks," and "Tactical Planning with Shelf-Life Constraints in the FMCG Industry." He then attended with Larry Biegler, the Scientific School "Computer Aided Process System Engineering on June 17-20, in Kazan, Russia where he gave the talks "Optimal Synthesis and Planning of Sustainable Chemical Processes," and "Mathematical Programming Approaches to Enterprise-wide Optimization of Process Industries." Finally, he attended the International Conference on Stochastic Programming, in Bergamo, Italy, July 8-11, where he gave the paper "Multistage Stochastic Programming for Planning under Endogenous Uncertainty: Models and Algorithms." In addition, Ignacio was appointed chair of the search committee for the Department Head in Chemical Engineering at Carnegie Mellon.

John Kitchin gave an invited talk titled "Assessment of Novel Pre-combustion CO₂ Capture Solvents at High Pressures and Temperatures using Raman Spectroscopy" at the World Congress of Chemical Engineering in Seoul, Korea. He also participated and spoke at the Yonsei Global Network Forum at Yonsei University in Seoul, Korea.

Dennis Prieve was invited to participate in the Oil Sands Tailings Workshop, to be held in Banff, Alberta on Nov. 7. The Workshop is organized by the Centre for Oil Sands Innovation and addresses the need to speed remediation of large "tailings" ponds generated by the mining of oil from the tar sands of Alberta. The purposes for the workshop are to announce the joint project funding schemes by COSI and the newly established oil sands industry alliance (COSIA Tailings EPA), identify fundamental gaps in oil sands tailings research (by the industry alliance) and brainstorm possible research directions and topics. Dennis will describe current research at CMU on charge effects in nonpolar media.

Nick Sahinidis. In April, Nick was a Lindsay Lecturer at Texas A&M University, College Station, Texas, Department of Chemical Engineering, where he talked about his new code ALAMO for automatic learning of algebraic models for optimization. He then gave a talk on the same topic as a D. B. Robinson distinguished speaker at the University of Alberta, Department of Chemical & Materials Engineering, also in April. In August, Nick lectured again on ALAMO at ExxonMobil Research and Engineering Company, Clinton, NJ, as part of a visit to ExxonMobil by DOE's Carbon Capture Simulation Initiative. In July 2013, he became the new Programming Chair of the CAST division of AIChE. His role is to oversee all programming activities of CAST areas (10abcde) during the fall and spring AIChE meetings, all conferences sponsored by CAST (FOCAPO, FOCAPD, CPC, PSE), and CAST co-sponsored activities as part of other conferences such as ACC and ADCHEM.

Jeff Siirola. Jeff continues to divide his time between CMU and Purdue. For the coming Fall Semester he will be at CMU where in addition to helping Ignacio with the Senior Process Design project, another route to aromatics from Pennsylvania Shale Gas, he also will teach an upper division elective course in Chemical Process Technology and Industry Structure and a mini graduate course on Advanced Process Synthesis. He taught the senior process design and chemical process technology courses at Purdue in the spring. He also made presentations on The Role of Process Integration in Process Synthesis in Gothenburg and Challenges to More Sustainable Energy Use in Chemicals Production in Dalian as well as seminars at the AIChE Midwest Regional Conference, Imperial College, Columbia, and at the Sustainable Manufacturing Roadmap Workshop. He also participated in advisory board meetings at Georgia Tech, Tennessee Tech, and Delaware and just about concluded his service as ABET Secretary and as ABET AIChE Society Liaison.

Bob Tilton delivered a keynote lecture on "Adsorption of polymer brush-grafted nanoparticles at the solid-liquid interface" as part of the Division of Colloid and Surface Chemistry's programming at the American Chemical Society Fall National Meeting in Indianapolis. John Riley and Kris Matyjaszewski were co-authors. Bob Tilton is serving on the Joint Working Group of the Divisional Activities Committee and the International Activities Committee of the American Chemical Society. The Working Group's mission is to assist the technical divisions of the ACS to engage in collaborative scientific activities with chemical professionals

worldwide.

Erik Ydstie is one of the 5 Trustees of the FIPSE (Future Innovations in Process Systems Engineering). The first conference of the FIPSE took place near Olympia, Greece in August, 2012. We are now planning FIPSE II which will take place in Crete in June 2014. Erik also organized a workshop on Thermodynamics and Mathematical Systems theory that took place in Lyon July 14-16 this summer. We had 25 presentations and 40 participants in the workshop. In May Erik taught on Adaptive Control at the CAPD short course. Erik visited UCL, at Universite Louvain la Neuve in Belgium. He was first opponent at a Ph.D. Defense UCT in Norway.

Welcome Visitors:

Mustafa Kilinc from Turkey, working with Prof. Nick Sahindis's research group to develop and implement algorithms for global optimization

Bin Zhao from Tsinghua University, working with Prof. Neil Donahue's research work to implement the Volatility Basis Set in air quality models designed to reproduce conditions leading to high levels of atmospheric particulate matter and thus to explore control scenarios to reduce pollution levels

Miguel Ángel Zamarripa Pérez, from Universidad Politecnica Catalunya (Spain) working with Prof. Ignacio Grossmann's group in the area of enterprise-wide optimization in collaboration with some of the companies of the CAPD

Chen Zhang from Zhejiang University, working with Prof. Larry Biegler's research group on operational optimization for large-scale complex process systems, including polymer processes, as part of your PhD thesis

Dr. Gunnar Dunér from KTH Royal Institute of Technology, Stockholm Sweden working with Prof. Bob Tilton's research group to conduct research for the project "Adsorption and Interfacial Transport of ZPT Microparticles"

Prof. Hyung Min Kim from Kyonggi University, Korea working with Prof. Myung Jhon's group and will deal primarily with the research on computational fluid dynamics and nano/micro scale transport processes modeling via lattice Boltzmann method, which are relevant to the mission of the Data Storage Systems Center (DSSC)

Prof. Xi Chen from Zhejiang University, China working with Prof. Larry Biegler's research group on optimization of chemical process systems

Undergraduate News

CMU SENIOR DESIGN PROJECT

In the fall semester the seniors in the design course worked on a design project related to the production of aromatics from shale gas. The shale gas in deposits like the Marcellus deposit contains in addition to methane "wet gas", something like 10-15% hydrocarbons like ethane, propane and butane. In fact, the large amount of cheap ethane has prompted Shell Oil to consider the construction of a world-class cracker in Monaca near Pittsburgh for producing ethylene.

Aside from promoting the re-birth of the traditional petrochemical industry in the US, the wet gas in the shale deposits offers the possibility of producing chemicals with new chemical pathways. An example is the production of aromatics, namely benzene, toluene and xylene from methane or ethane, the design project that was undertaken by the seniors, and which in fact was suggested by Bayer Corporation, since they are major consumers of aromatics. Teams of 4 and 5 students found ethane to be the preferred feedstock and designed processes for transforming it into aromatics. The economic evaluation by the student teams indicated that the production of aromatics from ethane is potentially highly profitable. The students presented their findings on Nov. 30 to an audience that included engineers from Bayer and NETL. The CMU media covered this project in the web-links:

http://www.cit.cmu.edu/media/press/2012/11_30_chem_shale_deposits.html

<http://www.cmu.edu/homepage/environment/2013/winter/innovative-aromatics.shtml>

In addition, a case study based on this project is being put together for CACHE for its distribution to US and international universities.

NEW COURSE ON CHEMICAL PROCESS TECHNOLOGY AND INDUSTRY STRUCTURE

Based on his extensive experience in the chemical industry, Dr. Jeff Siirola offered last fall a new unique course, 06-500 “Chemical Process Technology and Industry Structure.” The course is aimed at senior undergraduates and graduate students. This course surveys key sectors of the chemical processing industries and discuss the structure of the industry and the historical development and evolution of the technologies which have shaped them and the common flowsheet elements which have proven to be commercially successful. Examples are drawn from a range of industry sectors, production scales, chemistries, and enabling technologies. The industry is examined in light of factors which have most influenced its development including raw materials of choice, energy availability, and the development of new unit operations, as well as those which will influence its future course including advances in science and technology, environmental impact minimization, water availability, and sustainability concerns. This course was extremely well received by the students, and will be offered again in the fall.

2013– 2014 Officers of AIChE Student Chapter

President:	Chris Seok
Vice President:	Alexandra Newby
Secretary:	Alisa De Bruyn Kops
Treasurer:	Rebecca Wells
University Liasion:	Kiffele McBurnie
Industrial Liasion:	Immanuel Krogmann
Social Chair:	Madison Calhoun
Webmaster:	Anand Sastry
Class Rep:	Amy Yuan

2013-2014 SAC Members

Sophomores: **Sirena Wang, James Ham, Alexandra Mod**

Juniors: **Sam Klein, John Taormina, Christine Westcott**

Seniors: **Andrea Farinacci, Anand Sastry, Adam Cantini**

Graduate Placement statistics for the 2013 Senior Class were as follows:

The average starting salary was \$69,108. The high was \$107,000 and the low was \$50,000.

Seniors were hired by the following companies:

Accenture*	CBYX for Young	O’Neal Inc.
Air Products & Chemicals	Professionals	Open Curriculum
Aspen Technology*	Delphil FMC	OSIsoft, LLC
Athena Health	Dow Chemical Company	Palantir
Bayer Material Science	Eaton Corporation	PPG*
Boeing	Epic Systems	Samsung*
Boeing Commercial	Formosa Plastics	Schlumberger
Airplanes	Freescale Semiconductors	Vitech Systems Group
Braksem	Intel*	
Carmolex	Lanxess	<i>*Companies with more</i>
Caterpillar	Merck*	<i>than 1 hire</i>
	Mom Trusted	

Members of the Class of 2013 went to the following graduate schools:

CMU	University of California-Berkeley
Georgia Institute of Technology	University of California-Berkeley/San
Imperial College	Francisco
Lehigh University	Washington University
MIT	Yale University
Rensselaer Polytechnic Institute	

Congratulations to the following students on the Spring 2013 CIT Dean's List:

SENIORS (F13)	Alexandra Frankel	Samuel Winslow
Katia Bazzi	Erica Green	Darwin Yang
Adam Cantini	Jordan Green	Ariana Zito-Wolf
Julia Devito	Sara Kelly	
Bennett Kriete	Michelle Kim	SOPHOMORES (F13)
Michelle Ruiz	Sam Klein	Jonathan Berman
Stephen Scannell	Sarah Narburgh	Xi Chen
James Solomon	Mariah Ondeck	Maggie Chen
Ryan Trottier	James Petka	William French
Shrihari Venkatesh	Palak Pujara	Yoyinsola Ibikunle
Rebecca Wells	William Records	Taigyu Joo
Justin Young	Evan Starkweather	Eleanor Kwik
	Caitlin Streamer	Darwin Kwok
JUNIORS (F13)	John Taormina	Danielle Maly
Eamon Cullinane	Malavika Thottappillil	Ryan McKinney
George Degen	Krithiknath	Alexandra Newby
Amy Desalazar	Tirupapuliyur	Vishal Vala
		Sirena Wang

Welcome back to our returning 2012-13 Exchange Program Participants:

Imperial College, London

Julieta Gomez-Frittelli

Alexander Noeth

Yatindra Patel

Aachen University, Germany

Kathleen Bates

Annelie Niebuhr

Dortmund (Summer 2013)

John Taormina

Welcome to our new 2013-2014 Exchange Students:

Imperial College, London

James Phua

Xiaobin Wei

Yakun Zhang

RWTH Aachen University, Germany

Jochen Cremer

Lorenz Fleitmann

Andrea Koenig

Artur Schweidtmann

Dortmund

Lukas Maxeiner

EPFL

Memia Fendri

Yonsei

Soo Ah Jin

Jiwon Lee

Good luck to our students that are participating in the study abroad for this academic year:

Imperial College, London

Caitlin Streamer

Malavika Thottappillil

Krithiknath Tirupapuliyur

Sam Winslow

Ariana Zito-Wolf

RWTH Aachen, Germany

Christine Westcott

If you are interested in participating in any of the Departmental Exchange Programs, the application deadline is January 17, 2014. See **Cindy Vicker** in DH1101 for application information.

Graduation 2013 Awards

The Mark Dennis Karl Outstanding Teaching Assistant Award was presented to **Alexander Dowling**.

AIChE Professional Promise Award was presented to **Breanna Stillo**.

The Ken Westerberg Award was presented to **Nathaniel Ondeck**.

The memorial fund "The Ken Westerberg Memorial Prize for Excellence in Chemical Engineering Research" has been established by the department with a generous contribution from Aspen Technology and other friends of the Westerberg's and of the department. This prize is presented every year during the departmental graduation ceremony to a senior who has shown exceptional promise for research in chemical engineering. This prize has been established in the memory of Ken Westerberg who died of leukemia at the very young age of 35. Ken was the son of Art & Barbara Westerberg.

The Ken Meyer Award was presented to **Vijay Gupta**.

The Geoffrey D. Parfitt Award for Excellence in Research recipient was **Erin Donnelly**.

The American Institute of Chemists Foundation Award "For Ability, Character, Scholastic Achievement and Potential" was presented to **Joseph Selinger**.

The Carnegie Mellon McCabe Society honors the memory of Warren McCabe, one of the great leaders in this department's history, by recognizing students who show an unparalleled dedication to their community. The inductees from the Class of 2013 are:

Rocio Garay

Russell Hensley

Carol Kim

Zeinab Mohamed

Neha Nandakumar

Graham Spicer

Breanna Stillo

The Kun Li Award for Excellence in Education was presented to **Professor Robert D. Tilton**.

Graduate News

Welcome to our new graduate students:

PhD Students

Name	School
Travis Armiger	Rensselaer Polytechnic Institute
Rebecca Ball	Wayne State University
Toni Bechtel	Pennsylvania State University University Park
Alex Bertuccio	Manhattan College
Burcu Beykal	Koc University
Blake Bleier	University Of Pennsylvania
Mehak Chawla	Ohio State University
Markus Drouven	RWTH Aachen University
John Eason	University of Tulsa
Qingqi Fan	University of Tulsa
Randall Gamble	University of Pittsburgh
Devin Griffith	University of Oklahoma
Lisa Kasiewicz	Columbia University
Jiaying Ke	Purdue University West Lafayette
Nikolaos Lappas	University of Patras, Greece
Jianfeng Liu	University of California Berkeley
John Michael	Miami University of Ohio
Juan Morinelly	Michigan Technological University
Brittany Nordmark	University of Maryland Baltimore County
Irem Sen	Bogazici University
Nicholas Skarzynski	University of Massachusetts Amherst
Anirudh Subramanyam	Indian Institute of Technology
Emily Wallitsch	Lafayette College
Justin Weinberg	Cooper Union
Zachary Wilson	Georgia Institute of Technology
Xiaoxiao Yu	Ohio State University

MS Students

Name	School
Cheshta Balwani	Banaras Hindu University
Cheng Cheng	Beijing University of Chemical Technology
Weijia Cui	Tsinghua University
Tarun Dalwani	Vishwakarma Institute of Technology,Pune
Owaiz Ebrahim	Institute of Chemical Technology, Mumbai
Yuan Fang	Tianjin University
Arkah Ghosh	University of Michigan Ann Arbor
Nitish Govindarajan	Sastra University
Nishtha Gupta	Institute of Chemical Technology
Yash Khandor	Dwarkadas J. Sanghvi College of Engineering
Boyu Li	Beijing University of Chemical Technology
Chenkai Li	Tsing Hua University
Ran LiChong	Qing University
Zekun Li	Tianjin University
Chang Liu	East China University of Science and Technology

Nai-Yuan Liu	Chung Gang University
Xin Liu	Dalian University of Technology
Yu Liu	Fudan University
Irene Lotero Herranz	Universidad Politecnica de Madrid
Meiheng Lu	Dalian University of Technology
Jiaqi Luo	China University of Petroleum(East China)
Raj Maniar	Vishwakarma Institute of Technology (Pune)
Xinyu Nie	Tianjin University
Hsin Pang	Colorado State University
Arjun Ramesh	Vit University, Vellore
Niyatee Ravipati	Manipal Institute of Technology
Xudan Sha	Zhejiang University
Boya Shi	University of Toledo
Jiawei Sun	China University Mining and Technology
Jay Thakkar	Malaviya National Institute of Technology
Lin Wang	Southeast University of China
Boran Wei	Beijing University of Chemical Technology
Ruxin Wei	Xiamen University
Wenqin You	Dalian University of Technology
Nan Zhang	Dalian University of Technology
Tong Zhang	Tianjin University
Yunyao Zhang	University of Science and Technology of China
Hua Zheng	Fudan University
Xingshi Zhou	East China University of Science and Technology

MChE Students

Name	School
Ruoyu Bai	Nanjing University of Science and Technology
Sixue Cheng	South China University of Technology
Xiaoyu Liang	Tianjin University
Gongxun Liu	Beijing University of Chemical Technology
Jiesi Ma	Tianjin University

Master of Science in Colloids, Polymers, and Surfaces Students (MSCPS)

Name	School
Jialiu Zhang	The State University of New Jersey Rutgers Cook
Zechen Zhang	Tsing Hua University

Master of Colloids, Polymers, and Surfaces Students (MCPS)

Name	School
Prashansa Desai	Nirma University

Integrated Masters-Bachelors Students (MChE)

Name	School
James Church	CMU
Kevin Iacovino	CMU
Soohyun Park	CMU
Ziyi Zhu	CMU

Congratulations to our second year PhD students who passed their qualifier exams:

**Robert Apap
Nick Austin
Jacob Boes
Nick Chisholm
Stephanie Kirby**

**Christopher Knapp
Sreekanth Rajagopalan
Ramankur Sharma
Robert Stout**

**Wei Wan
Ningxin Wang
Mingzhao Yu
Qi Zhang**

ChEGSA Symposium by John Riley

The 35th Annual ChEGSA Symposium was held October 10-11, 2013. This year's program featured 25 research talks from 3rd, 4th, and 5th year PhD students, a keynote address and luncheon sponsored by the Dow Chemical Company, a poster session and luncheon sponsored by PPG Industries featuring the research of 2nd year PhD and MS students, and an awards banquet to recognize students with outstanding presentations. Other corporate sponsors who are represented at this year's Symposium include Exxon Mobil, Air Products, Lubrizol, Phillips 66, Bristol-Meyers-Squibb, Bayer, and Pfizer.

This year's Keynote Address was given by Enrique Iglesia, the Theodore Vermeulen Chair Professor of Chemical and Biomolecular Engineering at the University of California at Berkeley, Director of the Berkeley Catalysis Center, and Faculty Senior Scientist at the E.O. Lawrence Berkeley National Laboratory. His talk was "The Chemistry and Engineering of C1 Species and the Catalytic Challenges of Diverse Feedstocks without C-C Bonds."

ChEMSA News by Michael (Zefan) Jiang

Pittsburgh one day tour

As one of the biggest events from CheMSA, we prepared Pittsburgh one day tour for more than three months. This event is very popular among the new master students. In our minds, the best way to love the university and our department is to love the city and the life in this city. We took them to visit several places of interest in Pittsburgh, such as Duquesne incline, three sisters bridge, market square, Carnegie museum of natural history and art, Phipps conservation. The new students enjoyed the famous Primanti Brothers. The event also provides a platform for the new students to know each other. This is a pretty successful event and hope we can do it annually for all the new masters.

Airport pick up

Most of the masters are international students. When they first land in this freedom land, they don't have ID cards to take a bus. Going back school from airport is a problem. CheMSA took the responsibility of providing the new generation of our department helps. They organized several volunteers to set up a help desk. The CheMSA members helped the new students to find the bus, super shuttle and taxi.



Airport pick up picture, from left, Deyang Li (volunteer), Zhenhuan Zhong (VP of ChEMSA-finance), Michael Jiang (VP of ChEMSA), and Tarun Dalwani (new master student)

ChEMSA Officers are:

Judy Chen President

Pratik Shah Former President

Michael Jiang VP-Social

Robin Cheng VP-Social

Huangqiang Zhao VP-Academic

Zhenhuang Zhong VP-Finance

Rajan Chidambaram VP-Communication

Feng Cao Technical Support

Faculty Profile: Chrysanthos Gounaris

Hello everyone! My name is Chrysanthos Gounaris, and I am the newest addition to the Department's faculty, having joined this past August. In case it is not obvious from the "-os" suffix, the name is Greek. Furthermore, it is related linguistically to the flower Chrysanthemum, a member of the Asteraceae family of flowering plants. Although not all Chrysanthemums are gold in color, and certainly none of them is made of gold, the name etymologically means "golden flower." This of course opens up a number of possibilities for a nickname, and Prof. Walker has been quick to point out a few options (for some inexplicable reason, "flour" happens to be one of my favorites).



Although I was always oriented towards STEM fields, becoming a ChemE was sort of a last-minute decision. In fact, I only learned about the existence of a profession called "Chemical Engineer" as a

senior in high school, through an informational booklet that was intended to present possible career options. Since it was a small booklet, and there were too many professions to cover, each entry only got a one-sentence description. The description for ChemEs read something along the lines “the ones who design chemical plants.” This definition, of course, did not do justice to the breadth of what ChemEs do or can do, but it sounded cool enough for me to want to pursue the discipline. So I ended up being admitted to the ChemE department of the National Technical University of Athens (NTUA), along with another 178 classmates of mine that year. If this number seems large to you, keep in mind that there are also two other ChemE departments in Greece, one in the Aristotle University of Thessaloniki (the alma mater of Prof. Sahinidis) and one in the University of Patras (the alma mater of Prof. Pandis), altogether producing a lot of ChemEs each year for a country with a population smaller than Pennsylvania’s. In retrospect, I find my decision to become a ChemE in Greece as a bit irrational, but at the time I must have thought that a small country with a rather weak industrial base had a need for many chemical plant designers.

Despite the unlikely prospect of finding a job in Greece after graduation, I was really excited about the things I was learning in college. I came to the realization that ChemEs do a lot more than designing the plants and also that the plants can be much more than your stereotypical industrial facilities. Formal training in Chemical Engineering actually equips you to pursue a wide variety of interesting topics, and I have set out to do this ever since. I stayed an additional year at NTUA to pursue an M.Sc. in Process Control, and then came to the US for further studies. I pursued my Ph.D. at Princeton University under the supervision of Prof. Chris Floudas, who had pursued his own Ph.D. at CMU under the supervision of Prof. Grossmann (this in fact makes me the fifth academic descendant—and first great-grandchild—of Prof. Roger W.H. Sargent to join the faculty of this Department, after Profs. Westerberg, Grossmann, Ydstie, and Sahinidis). My doctoral research explored the use of nonlinear modeling and global optimization techniques in the study of process networks and porous materials. After completion of my degree in 2008, I decided to join McKinsey & Co., a management consulting firm, where I worked in interdisciplinary teams to address “big-picture” questions of some truly big corporations. The experience was very developmental, but also made me realize that it was not the type of problem solving I was after. I gain a lot of satisfaction from using mathematics and scientific rigor when approaching problems, and I enjoy taking the time necessary to delve into the details and seek the original contributions. These are things you cannot always afford in the corporate setting, and the experience solidified my desire to follow an academic career. As Prof. Floudas put it, I had now “seen the light.” So, I returned to my former lab and continued my research with an expanded focus that now included supply-chain optimization and the issue of how to cope with uncertainty during decision-making. Last year, I also did a short pass from the Greek military (service is mandatory for Greek nationals), but in the interest of space, I’ll designate the mostly-embarrassing details as “too classified” for this article.

On a personal note, Megan (my fiancée) and I are thrilled to have moved to Pittsburgh. We still haven’t explored much of it, but the place appears to have tons of possibilities. Megan has a Ph.D. in Anthropology (Princeton, 2011), and starting next semester, she will be teaching at UPitt. It probably comes as no surprise that at home I don’t get to talk much about my research (and when I do, it somehow always leads to me doing the dishes). So, I should take this opportunity to say that I am broadly interested in the development of theory and quantitative methodologies to inform complex decision-making in a variety of areas, including Process Operations, Materials Design and Metabolic Engineering. Furthermore, I am always on the lookout for interested researchers (of all tenures) to join me in those efforts. Whenever you get a chance, please drop by my office (DH 3107, more widely known as the “third-floor copier room”) to say hi (or to ask me do your photocopying for you).