Message from the Department Head

Now that the pleasant days of summer are just a memory, I am glad to welcome our students back to campus. I especially hope you all had a restful summer break before returning to the Fall semester. The past academic year 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. It is a special privilege for me to recognize all of their hard work.

In particular, it is a great pleasure to welcome Prof. Anne S. Robinson from Tulane University to our department and to announce her appointment as the next Department Head, effective November 1. Moreover, I am very pleased to announce the arrival of Dr. Coty Jen, who received her PhD from Minnesota and works in the area of atmospheric chemistry. She joins us after completing her postdoc at Berkeley. Also, the department offers a warm welcome to Dr. Diane Nelson as a President's Postdoctoral Fellow.

After a long, distinguished career spanning four decades and many contributions to our department, Prof. Myung Jhon retired last June. In addition, after 20 years in our department and in Biomedical Engineering, with many contributions to both departments and to the University at large, Prof. Todd Przybycien has decided to return to the Rensselaer Polytechnic Institute. We will miss both Myung and Todd, and wish them well in all of their future plans.

Among the many recognitions over the past year, I am very glad to acknowledge a number of faculty awards. It is a pleasure to congratulate Coty Jen on receiving the Friedlander Award, the most prestigious early career award in aerosol science. Congratulations go to Katie Whitehead for winning the CIT George Tallman Ladd Research Award and the DARPA Director’s Fellowship for her pioneering work in drug delivery. Congratulations go to Neil Donahue, a Highly-Cited Researcher, for the award of the Philip L. Dowd Fellowship, to develop educational modules on climate change. In addition, congratulations to Chrysanthos Gounaris, who won the Kun Li Award in our department for excellence in teaching. Also, congratulations to Ignacio Grossmann, a Highly-Cited Researcher, who ranks 41st in the US on the Google H-index of top scientists. Finally, it is a pleasure the acknowledge the recent recognitions of our distinguished alumni.
My congratulations go to the class of 2018! We have graduated an outstanding class with 82 seniors, 12 masters students and 15 PhDs. I wish you all the best in your future career plans and professional goals. My colleagues and I especially enjoyed celebrating with you at Commencement. In addition, I am pleased to recognize the awards of our outstanding undergraduate students, including our Powers Scholars, Adrian Berger, Christopher Lee and Jack Ronayne, and our Berg Scholars, Dhruva Byrapatna, Ian Tilton and Sophia Wang.

At the same time, I would like to welcome our 50 first year students, who are now declared Chemical Engineering undergraduate majors, as well as our incoming class of 10 PhD candidates. We also extend a welcome to the incoming class of 65 masters students this semester. My thanks go to James Schneider, Allyson Danley and Cynthia Vicker for their excellent management and organization of the recruiting process.

With my term as Department Head coming to a close, I offer my special thanks to our departmental staff and faculty colleagues, who continue the high level of performance in the department. I especially appreciate their experience in covering all of the bases over the last five years.

Have a great semester!

Larry
A big welcome to our new department head, Anne Robinson! Professor Robinson, a graduate of Johns Hopkins University and University of Illinois at Urbana-Champaign, was formerly at the University of Delaware and most recently was the chair of the Department of Chemical and Biomedical Engineering at Tulane University. Professor Robinson is an internationally-recognized researcher with active programs in membrane protein expression and biophysical characterization, protein refolding and aggregation, and biopharmaceutical protein expression. More details of her research are listed in the Faculty Profile in this edition.

Prof. Myung S. Jhon retired last June as a Professor of Chemical Engineering, after nearly 40 years with Carnegie Mellon. He was a member of the Data Storage Systems Center (DSSC) and the Institute for Complex Engineered Systems. Professor Jhon received his B.S. in Physics from Seoul National University, Korea, and his Ph.D. in Physics from the University of Chicago. He has served as visiting professor in several institutions, including the U.S. Department of Energy (National Energy Technology Laboratory and Sandia National Laboratories), UC Berkeley; IBM, San Jose; and the Naval Research Laboratory. With over 450 scientific publications, he is internationally known for his work in the fields of computational science, information storage systems, nanotechnology, organic light-emitting devices, and chemical mechanical polishing. While on leave from CMU, Professor Jhon served as the President & CEO of Doosan DND Co., Ltd. as well as serving as World Class University Professor at Sungkyunkwan University in Korea. Professor Jhon is a Fellow of the Korean Academy of Science and Technology. He was also chair of the advisory board and lead organizer of the U.S.-Korea Nanotechnology Forum.

Professor Jhon was a favorite teacher among undergraduate and graduate students alike, and taught a wide range of courses from Fluid Dynamics, Thermodynamics, and Engineering Mathematics. Since 2001, he served as an ABET evaluator for 10 ChE programs. Moreover, he was widely recognized as an esteemed educator, and won numerous teaching awards including the Kun Li Teaching Award, the CIT Faculty Award from the Society of Women Engineers, the Ladd Award for Excellence in Research and Teaching, the Ryan Teaching Award for Excellence in Undergraduate Teaching, and the Teare Award for Excellence in Teaching.
After 20 years in the Chemical and Biomedical Engineering Departments, Prof. Todd Przybycien has returned to Rensselaer Polytechnic Institute. Professor Przybycien received a BS in Chemical Engineering and a AB in Chemistry from Washington University in St. Louis and received MS and PhD degrees in Chemical Engineering at CalTech. He worked for two years at Monsanto Agricultural Company as a Senior Research Engineer before joining RPI in 1991 and CMU in 1996. At CMU, he served as the founding Head of BioMedical Engineering from 2002-2008. Dr. Przybycien’s research focuses on industrial downstream bioprocessing, drug delivery and medical device development. These activities are linked via fundamental interests in biophysics and in colloid and interface science, with application of spectroscopic, optical, physical, simulation and informatics tools to connect microscopic, molecular-level behavior to macroscopic, process-level engineering decision variables. With over 130 scientific publications, Prof. Przybycien is internationally known for his research in biomedical engineering, and has been recognized as a Fellow of AIChE and AIMBE. He was a recipient of the Camille Dreyfus Teacher Scholar Award, received an NSF CAREER Award and has served as Associate Editor of Biotechnology and Bioengineering. At CMU, he was twice named Biomedical Engineering Professor of the Year.
Allyson Danley, graduate admissions manager, recently returned from her maternity leave and will be working part-time until October, when she resumes her full-time duties. She is currently being assisted by Shanning Wan, who is in the same office as Allyson.

A staff retreat was held on June 4 of this year at Hobby Prodigy, which enabled staff members to build/paint/produce a craft item. Lunch was provided after the event. Below Shirley Pavlishak, Julie Tilton, Dave DeLo, Laura Shaheen, Justin Dawber, Heather DePasquale, Matt Cline, Cindy Vicker and Janet Latini all demonstrate their talents.
Welcome to new Assistant Professor Coty Jen, who started here in September. A graduate of Columbia University and the University of Minnesota, Coty comes to us from the University of California, Berkeley where she was a National Science Foundation AGS Postdoctoral Research Fellow.

Neil Donahue is the recipient of the 2018 Philip Dowd Fellowship awarded to a faculty member in engineering to recognize educational contributions and to encourage the undertaking of an education project.

Katie Whitehead has won the George Tallman Ladd Research Award in recognition of outstanding research and professional accomplishments and potential.
Faculty Promotions:

Kris Dahl has been promoted to Professor of Chemical Engineering.

Chrysanthos Gounaris has been promoted to Associate Professor of Chemical Engineering.

Susana Stepan has been promoted to Associate Teaching Professor of Chemical Engineering.
--Shelley Anna.  Shelley has been selected for the ELATE program at Drexel University. This unique and prestigious program, which runs from May 2018 until March 2019, fosters professional development in women in the academic STEM fields in order to advance them into leadership roles within their institutions.

--Neil Donahue. Neil spoke with Forbes magazine about the potentially detrimental effects of the repeal of the mandate to increase fuel efficiency in automobiles. Donahue asserts that "this will have catastrophic consequences for both climate and public health."

--Myung Jhon. Myung co-hosted the US-Korea Forum on Nanotechnology: Nanomedicine Focusing on Single Cell Level and Internet of Things (IoT) including Nanosensors, held in Kintex, Korea in July 2018.

--John Kitchen. John gave the keynote address at the Pacific Northwest National Laboratory in June of this year, speaking about combining experimental and computational research, "Applications of Machine Learned Potential in Surface Science, Catalysis and Materials."

--Nick Sahinidis. Nick was featured in the College of Engineering website for his pioneering work on the ALAMO system, which implements novel machine learning techniques that are based on optimization. The full story is available: https://engineering.cmu.edu/news-events/news/2018/07/23-alamo-sahinidis.html

--Jim Schneider. Jim received a 3-year NSF grant for rapid DNA analysis technology. He is currently working to commercialize this technology specifically for applications in forensic identification.

--Bob Tilton. Research conducted by Bob, along with Todd Przybycien (who recently left our department), on the use of sand modified by plant materials for sustainable water treatment in the developing world received worldwide attention from several media outlets, including NDTV (India), BBC India, The University Network and WESA, the Pittsburgh NPR affiliate. More information is available at: https://engineering.cmu.edu/news-events/news/2018/06/13-seed-clean-water.html. Bob also delivered an invited presentation of his group's fundamental research on colloidal forces in multicomponent complex fluids at the American Coating Conference Symposium "Science Today--Coatings Tomorrow" held in Indianapolis in April 2018.

--Lynn Walker. Lynn was a plenary speaker at the 7th Pacific Rim Congress on Rheology in Jeju, Korea in June, 2018.

--Katie Whitehead. Katie gave the keynote talk at the 2018 Canadian Biomaterials Society Annual Meeting in Victoria, BC. She has also been featured on the College of Engineering website for her pioneering RNA drug delivery techniques. In addition, Katie has been elected as the vice-chair of the Gordon Research Conference Drug Carriers in Medicine and Biology. Finally, Katie received the Defense Advanced Research Projects Agency (DARPA) Director's Fellowship in support of her work on mRNA delivery systems.
The annual faculty retreat was held at the Pittsburgh Golf Club in August and was followed by dinner there. At left are new faculty member Coty Jen and her guest Hamish Gordon.

**Outreach**

The Outreach Team, comprised of Annette Jacobson, Susana Steppan, and Ilhem-Faiza Hakem, conducted a variety of programs this summer including:

Making shrinky-dinks and judging at Jefferson Elementary (Mt. Lebanon) Science Fair, Gelfand Center Summer Sampler, Betty Shimada Engineering Workshop for high school girls, Summer Engineering Experience for 8/9th grade girls, and CIT/HCV Engineering Summer Camp for African-American students.

Ilhem and Susana instruct some of the girls in the Summer Engineering Experience.
Welcome Visiting Scholars

Cristian Pablos from the University of Valladolid, Spain is hosted by Larry Biegler.

Charalampos (Harry) Christidoulou of University College, London is working with Aditya Khair.

Diane Nelson of CMU is a Presidential Postdoctoral Fellow who will be working with Bob Tilton.

Seion Back of Stanford University is hosted by Zack Ulissi.

Neda Sanatkaran from New Mexico State University will be working with Lynn Walker.

Jilian Melamed of University of Delaware is working with Katie Whitehead.

Leyla Ozkan from Eindhoven University of Technology is hosted by Erik Ydstie.

Undergraduate News

Senior Christopher Lee received a Tau Beta Pi Stabile Scholarship, which honors high levels of scholarship, campus leadership and promise of future engagement with engineering exhibited by Tau Beta Pi members.

Junior Lavonca Davis has won a Perryman Family Foundation Scholarship which rewards hard-working students pursuing post-secondary education and who hope to apply their education to make a difference in the world.
The Gary Powers Memorial Scholarships, which honor Junior ChemE students who are naturally curious, possess deep passion for chemical engineering fundamentals, and who appreciate the engineer's role in society has been awarded to Jack Ronayne, Adrian Berger, and Christopher Lee (see below). Congratulations to all!

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All Chemical Engineering undergraduate students who conducted research on campus during the summer of 2018 or the 2017-18 academic year were invited to present a poster on their work at the 4th Annual John Berg Chemical Engineering Undergraduate Symposium Poster Session held recently in Doherty Hall. Three students were selected to participate in the AIChE Undergraduate Poster Competition at the AIChE annual meeting in Pittsburgh in October. This year's Berg Scholars, pictured below, are Ian Tilton, Sophia Wang, and Dhruva Byrapatna.
The senior banquet took place in December at the LeMont restaurant and was attended by more than 70 seniors. In addition to the wonderful meal, seniors played a chemical engineering trivia game. Enjoying the view and the conversation are Roxana Wolfson, Edward Healy, Benjamin Mersman, and Hannah Avery.
Congratulations and good luck to our students who graduated in Spring 2018:

Bachelor of Science in Chemical Engineering

Alaina Anand
Minor: Operations and Supply Chain Management

Nnamdi Anomnachi

Hannah Avery
Additional Major: Biomedical Engineering

Louis Ayisi

Palak Bajaj
Additional Major: Biomedical Engineering
Minor: Business Administration

Johnny Bates

Cameron Breze
Additional Major: Biomedical Engineering
Minor: Chemistry

Gabriela Cach
Additional Major: Engineering and Public Policy

Jonathan Calvello

Emily Carvalho

Anagha Chandra
Additional Major: Biomedical Engineering

Deborah Chu
Minor: Computer Science

Francisco Delgado
Additional Major: Biomedical Engineering

Ian Donovan

Tyler Eckler
Minor: Physics

Minrui Feng
Additional Major: Biomedical Engineering

Eloy Fernandez

Yuanyuan Fu
Additional Major: Biomedical Engineering

Swetha Gandu
Felicity Gong
Jean Haddad
Minor: Business Administration

Edward Healy
Additional Major: Biomedical Engineering
Minor: Hispanic Studies

Natalie Hong
Additional Major: Biomedical Engineering
Minor: Music

Sunah Hong
Minor: Design

Simone Hugh Sam
Additional Major: Biomedical Engineering

Brent Ifemembi
Additional Major: Biomedical Engineering

Taigyu Joo

Tanvi Joshi
Additional Major: Engineering and Public Policy

Ruby Julaj
Minor: Hispanic Studies

Neha Kapate
Additional Major: Biomedical Engineering

Tiffney Kathir
Minor: Business Administration

Shrishti Kedia
Minor: Computer Science

Jae Yeon Kim
Additional Major: Biomedical Engineering
Minor: Chemistry

Andrew Lee

Ji Yoon Lee
Minor: Environmental Engineering & Sustainability

Yun Jung Lee
Additional Major: Chinese Studies

Mark Lee-Shue
Amanda Li  
Minor:  Biomedical Engineering

Jiaying Li

Velisa Li  
Additional Major:  Engineering and Public Policy

Sooyeon Lim  
Minor:  Chinese Studies

Sicong Liu  
Additional Major:  Physics

Jennifer Lott  
Minors:  Chemistry & French and Francophone Studies

Nicholas Medich  
Minor:  Music

Benjamin Mersman  
Additional Major:  Biomedical Engineering

Victor Michel  
Minors:  Business Administration & Computer Science

Caroline Morin  
Additional Major:  Biomedical Engineering  
Minors:  Chemistry & Music

Julia Napolitano  
Additional Major:  Biomedical Engineering  
Minor:  Music

Alicia Ng

Jae Gang Oh

Matthew Palmer

Yueying Pan

Aakash Parekh  
Additional Major:  Biomedical Engineering  
Minor:  Business Administration

Megan Pudlo  
Additional Major:  Biomedical Engineering

Andres Ramirez  
Additional Major:  Biomedical Engineering

Himali Ranade  
Additional Major:  Biomedical Engineering
Minors: Business Administration & Operations and Supply Chain Management

Rohan Reddy
Minors: Business Administration & Operations and Supply Chain Management

Jazmin Rocha
Additional Major: Engineering and Public Policy

Scott Rohrer
Minors: Chemistry & Linguistics

Daylin Russo
Additional Major: Biomedical Engineering

Cheyenne Shankle
Additional Major: Engineering and Public Policy
Minor: Business Administration

Shridhar Singh
Additional Major: Biomedical Engineering

Hua Zhi Situ
Minor: Business Administration

Cameron Smith
Additional Major: Biomedical Engineering

Michelle Smyk
Additional Major: Biomedical Engineering

Tianyi Song
Minor: Global Engineering

Chauyie Soong
Additional Major: Biomedical Engineering

Oluwatomisin Soyebo

Kevin Steinhouse
Minor: Computer Science

Emily Tencza
Minor: Software Engineering

Brendon Tsai
Minor: Business Administration

Alexandra Vendetti
Minor: Biomedical Engineering

Praveer Vyas
Minor: Biomedical Engineering

Jamei Wang
Chase Webb  
Additional Major: Biomedical Engineering

Alisandra Welch  
Minor: Business Administration

Sarah Winget

Roxana Wolfson  
Minor: Business Administration

Annabella Wong

Michelle Wu  
Additional Major: Biomedical Engineering

Nathan Wu  
Additional Major: Engineering and Public Policy

Mengxi Yang  
Additional Major: Biomedical Engineering

Yilin Yang  
Additional Major: Biomedical Engineering
Awards Presented at Graduation:

AIChE Professional Promise Award
Matthew Palmer

Ken Westerberg Award
Alisandra Welch

Geoffrey Parfitt Award
Alaina Anand

Ken Meyer Doctoral Research Award
Justin Weinberg
American Institute of Chemists Award

Yilin Yang

McCabe Society Award

Cameron Breze, Gabriela Cach, Tiffney Kathir, Caroline Morin, Megan Pudlo, Rohan Reddy, Chase Webb

Mark Dennis Karl Outstanding Teaching Assistant Award

Natalie Isenberg

Kun Li Award for Excellence in Education

Professor Chrysanthos Gounaris, holding the Kun Li Award presented by Larry Biegler and students Chase Webb, Brent Ifemembi and Himali Ranade.
Placement statistics for the 2018 Senior Class are as follows:

The average starting salary was $72,173. The high was $102,000 and the low was $38,400.

Seniors were hired by the following companies:

Accenture*
Anheuser-Busch
Axalta
Battelle*
Black Rock
Braskem
Bristol-Myers Squibb
Covestro
Deloitte
Eli Lilly & Co
Epic*
ExxonMobil*
Formosa
Hylion
Merck*
National Institute of Health*
OSISoft
Parsons
PNC Financial Services
Procter & Gamble
Schlumberger*
The Clorox Co.
Translate Bio
Venture for America
Vitro Architectural Glass*
West Monroe Partners

*Companies with more than 1 hire

The Class of 2018 went to the following graduate schools:

CMU*
Columbia University
Cornell
Northwestern
Temple University
UC Berkeley*
USC
Congratulations to the following students who were on the CIT Dean’s List for Spring 2018:

**SENIORS**
Michelle Bai
Sanjna Bhartiya
Kevin Cai
Teddy Cai
Qilin Cao
Sujay Desai
Michael Hall
Yue Han
Sunjeev Kale
Nin Rebecca Kang
Paul Kim
Christopher Lee
G Ping Lee
Jacqueline Lewis
Siyiing Li
Christopher Littrell
Beichen Liu
Alexander Noring
Richard Ruales
Chaitanya Singh

**JUNIORS**
Joseph Brauch
Dhruva Byrapatna
Lavonca Davis
Mia Keyser
Renee Morton
Emily Parks
Chandler Sabourin
John Solomon
Talia Solomon
Ian Tilton
Isabella Vendetti
Yu Zhou

**SOPHOMORES**
Kristen Atcheson
Charles Backman
Rui Qi Chen
Augustine Duffy
Jason Folker
Lily Gido
Madison Greer
Shraiy Gupta
Juyeon Ha
James Kirkby
Zachary Kowalewski
Joseph Krempa

Jenna Lee
Madeline Leppla
Jessica Li
Julia Lui
Jay Milch
Jill Nelson
Vivienne Pham
Adam Schwab
Sanjana Shah
Liana Song
Jeremy Tinucci
Abigail Vesco
Katrina Wong
Evan Zeng
Exchange Students

WELCOME BACK!
Welcome back to our returning 2017-2018 Exchange Program participants:

Imperial College, London
Regine Choi
Jeannie Michaels

Welcome to our new 2018-2019 Exchange Students:

Imperial College, London
Daniel Freake
Natsuko Robert

RWTH Aachen
Laurens Lueg
Martin Pillich
Romeo Valentin

Yonsei University
Jiwon Chung
Hyokyung Kim

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

Imperial College, London
Mia Keyser
Avishi Malaviya
Charles Meacham
Isabella Vendetti

Universidad Nacional del Litoral
Katherine Marcan

If you are interested in participating in any of the Departmental Exchange Programs, the application deadline is January 18, 2019. See Cindy Vicker in DH1106 for application information.
Graduate News

New PhD alums Travis Armiger, Brittany Nordmark, Toni Bechtel, Lisa Kasiewicz, Blake Bleier, and Irem Sen pose after signing the wall in the grad student lounge.

Mariah Arral (pictured below), coming from the University of New Hampshire, has won a National Science Foundation Graduate Research Fellowship in order to pursue her PhD here.

ChemE PhD candidate Brian Dinkelacker was awarded a Steinbrenner Institute Fellowship for 2018/19. This fellowship provides support to a second-year PhD student who is engaged in cutting edge environmental research.

Namit Chaudhary, ChemE PhD student advised by Katie Whitehead, has been awarded the Weiland grad fellowship.

Connor Valentine, ChemE PhD student advised by Lynn Walker, has been awarded the 2017/18 Exxonmobil grad fellowship. Connor also won an honorable mention at the National Graduate Research Polymer Conference poster session.

Khalid Hajj, ChemE PhD student advised by Katie Whitehead, won one of 4 poster awards out of ~300 posters at the Controlled Release Society. He also won the Best Poster Award at the Gordon Research Symposium on Drug Carriers in Medicine and Biology for his work on mRNA delivery.
Congratulations to the newly elected ChEGSA officers!

**President** - Marty Burton  
**Vice President** - Jason Kabarowski  
**Symposium Chairs** - Bowen Huo, Natalie Eisenberg, Nick Golio  
**Social Chairs** - Farrah Haeri, Jack Johnson, Mariah Arral, Robby Parker, Siddarth Achar  
**Webmaster** - Marissa Engle  
**GSA Representatives** - Gautham Swaminathan, Luke Habib, Yanxin Li  
**Fundraising Officer** - Brian Dinkelacker  
**Outreach Coordinators** - Bhavya Balu, Rose Doerfler

The new board will begin their term in January 2019.

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**Congratulations and good luck to our students who graduated in Spring 2018:**

**Doctor of Philosophy in Chemical Engineering**

**Travis Armiger**  
Advisor: Kris Dahl  
**Force Propagation in Mammalian Cell Systems and the Relevance of the Mechanically Integrated Cell**

**Rebecca Ball**  
Advisor: Kathryn Whitehead  
**Title:** Oral Delivery of Lipid Nanoparticles with siRNA for the Treatment of Intestinal Diseases

**Toni Bechtel**  
Advisor: Aditya Khair  
**Micro-mechanical Modeling of Brownian Spheroids in Oscillatory Shear Flow**

**Blake Bleier**  
Advisors: Lynn Walker and Shelley Anna  
**Droplet-based Approaches to Probe Complex Behavior in Colloidal Fluids with High Composition Resolution**

**Soham Dutta (Summer 2018)**  
Advisor: Andrew Gellman  
**Enantiomer Chemistry on Chiral Surfaces: Amino Acids on Copper**

**John Eason**  
Advisor: Lorenz Biegler  
**A Trust Region Filter Algorithm for Surrogate-based Optimization**
Devin Griffith (Summer 2018)
Advisor: Lorenz Biegler
*Advances in Nonlinear Model Predictive Control for Large-Scale Chemical Process Systems*

Lisa Kasiewicz
Advisor: Kathryn Whitehead
*siRNA Loaded Lipidoid Nanoparticles and the Immune System*

Jiaying Ke
Advisors: B. Erik Ydstie, Aditya Khair
*Process Design and Modeling of the Horizontal Ribbon Growth Method for Continuous Production of Silicon Wafers*

Brittany Nordmark
Advisors: Robert Tilton, Todd Przybycien
*Efficacy of Moringa oleifera Proteins as Coagulants in a Sustainable Sand Filter for Drinking Water Treatment*

Sreekanth Rajagopalan
Advisor: Nikolaos Sahinidis
*Design and Maintenance Planning Problems in Commodity Distribution and Chemical Site Networks*

Ningxin Wang
Advisors: Spyros Pandis, Neil Donahue
*Multi-generation Chemical Aging of Secondary Organic Aerosol Components Under Initial High/Low NOx Conditions*

Xiaoxiao Yu
Advisor: Andrew Gellman
*High Throughput Assessment of Multicomponent Alloy Materials*

Zixi Zhao (Summer 2018)
Advisor: B. Erik Ydstie
*Passivity-based Adaptive Control of Chemical Reactions in the Absence of Reaction Kinetics Information*

**MASTERS**

MS in Chemical Engineering

Mukta Hardikar
Congratulations to the following student who recently presented her research proposals:

**Bhagyashree Lele**
Advisor: Robert Tilton

*Impact of Polymer/Surfactant Complexation on Colloidal Depletion Forces*
Congratulations to our second-year Ph.D. Students who passed their qualifier exams:

Zicheng Cai
Namit Chaudhary
Brian Dinkelacker
Rose Doerfler
Can Ekici
Carlos Fernandez Caban
Sandra Fomete
Zhitao Guo
Peter Hayes
Tsung-Lin Hsieh
Christian Hubbs
Kimberly Hui
Mackenzie Humes
Jason Kabarowski

Virginia Lane
Brandon Lopez
Kaiwen Ma
Eyan Noronha
Robert Parker
Shivam Sahu
Owais Sarwar
Connor Valentine
Hua Wang
Deyu Yang
Junwoong Yoon
Noriyuki Yoshio

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

**PhD Students**

<table>
<thead>
<tr>
<th>Name</th>
<th>School</th>
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<tbody>
<tr>
<td>Mariah Arral</td>
<td>University of New Hampshire</td>
</tr>
<tr>
<td>Farrah Haeri</td>
<td>North Carolina State University, Raleigh</td>
</tr>
<tr>
<td>Aliakbar Izadkhah</td>
<td>University of California, Davis</td>
</tr>
<tr>
<td>Jack Johnson</td>
<td>Colorado State University, Ft. Collins</td>
</tr>
<tr>
<td>Dylan Lewis</td>
<td>Rochester Institute of Technology</td>
</tr>
<tr>
<td>Kuan-Han Lin</td>
<td>National Taiwan University</td>
</tr>
<tr>
<td>Hector Perez Parra</td>
<td>Brigham Young University</td>
</tr>
<tr>
<td>Muhammed Shuaibi</td>
<td>Illinois Institute of Technology</td>
</tr>
<tr>
<td>Dontavious Sippial</td>
<td>Auburn University</td>
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<tr>
<td>Xiangyu Yin</td>
<td>Tianjin University</td>
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**MS Students**

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<tr>
<th>Name</th>
<th>School</th>
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<tbody>
<tr>
<td>Siddartha Achar</td>
<td>R.V. College of Engineering</td>
</tr>
<tr>
<td>Swapnil Agrawal</td>
<td>IIT, Delhi</td>
</tr>
<tr>
<td>Khalid Alfahadi</td>
<td>King Fahd University of Petrol and Minerals</td>
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<tr>
<td>Chinmay Aras</td>
<td>University of Mumbai</td>
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<tr>
<td>Mingchuan Bai</td>
<td>Michigan State University</td>
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<tr>
<td>Deepro Banerjee</td>
<td>Jadavpur University</td>
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<tr>
<td>Amish Chovatiya</td>
<td>Ahmedabad University</td>
</tr>
<tr>
<td>Gillian Colman</td>
<td>Worcester Polytechnic Institute</td>
</tr>
<tr>
<td>Madhulika Dashputre</td>
<td>Savitribai Phule Pune University</td>
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</table>
Xinyi He  Tianjin University  
Danlei Huang  Beijing Inst of Petrochem Technology  
Zhenjie Jia  Tianjin University  
Siddhant Lambor  Birla Inst of Tech and Science, Pilani  
Akkarakaran Leonard  National Institute of Technology, Karnataka  
Lihan Liu  Sichuan University  
Senhong Liu  Sun Yat-sun University  
Shena Marshall  Rochester Institute of Technology  
Minchen Mu  Dalian University of Technology  
Dingqi Nai  University of California, Davis  
Nilesh Orupattur  Institute of Chemical Technology  
Joshwa Tanmay Raj  Birla Inst of Technology and Science  
Shiv Rekhi  Anna University  
Muyi Song  Tianjin University  
Sukmin Sung  Kyung Hee University  
Gautham Swaminathan  R.V. College of Engineering  
Katsuyuki Tomita  University of Tokyo  
Kunal Kalpesh Velinkar  Datta Meghe College of Engineering  
Keye Wang  Tianjin University  
Qiong Wang  Wuhan University  
Kai Wu  East China University of Science & Technology  
Yu Xing  East China University of Science & Technology  
Chengtian Zhang  Taiyuan University of Technology  
Qingyang Zhang  Haverford College  
Yuyue Zhang  Wuhan University  
Zhiqin Zhang  Sichuan University  
Xinliang Zhao  Zhejiang University of Technology  
Yao Zhao  Hefei University of Technology

**Master of Chemical Engineering (MChE)**

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<tr>
<th>Name</th>
<th>School</th>
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<tbody>
<tr>
<td>Alexander Abrams</td>
<td>Pennsylvania State University</td>
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<tr>
<td>Dechuan Du</td>
<td>East China University of Science &amp; Technology</td>
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**Master of Chemical Engineering/ETIM Dual Degree**

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<thead>
<tr>
<th>Name</th>
<th>School</th>
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<tbody>
<tr>
<td>Labdhi Kiran Haria</td>
<td>Institute of Chemical Technology</td>
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**Master of Chemical Engineering/MS-TV Dual Degree**

<table>
<thead>
<tr>
<th>Name</th>
<th>School</th>
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<tbody>
<tr>
<td>Geethanjali Anand</td>
<td>University Wisconsin Colleges</td>
</tr>
<tr>
<td>Sasidharan Sathiyamoorthy</td>
<td>BITS Pilani</td>
</tr>
<tr>
<td>Lili Tong</td>
<td>UC-Davis</td>
</tr>
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**Integrated Masters-Bachelors Students (MChE)**

<table>
<thead>
<tr>
<th>Name</th>
<th>School</th>
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</table>
Johnny Bates  
Eloy Fernandez  
Yun Jung Lee  
Crystear Liu  
Rohan Reddy  
Michelle Smyk  
Alexandra Vendetti  
Mengxi Yang  
Carnegie Mellon University

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

<table>
<thead>
<tr>
<th>Name</th>
<th>School</th>
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<tbody>
<tr>
<td>Jeff Brindle</td>
<td>CCAC</td>
</tr>
<tr>
<td>Alicia Ng</td>
<td>Carnegie Mellon University</td>
</tr>
<tr>
<td>Yueying Pan</td>
<td>Carnegie Mellon University</td>
</tr>
<tr>
<td>Bharath Raghavan</td>
<td>R.V. College of Engineering</td>
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Master of Chemical Engineering/Colloids, Polymers and Surfaces (MChE/CPS)

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<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Rohan Reddy</td>
<td>Carnegie Mellon University</td>
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CONFERENCES AND LECTURES

The 2018 Herbert Toor Chemical Industry Lectureship took place on May 1 of this year in Doherty Hall. The speaker was Christine Bryant, senior Vice-President, Polyurethanes, NAFTA, of Covestro, LLC. Bryant earned her master's in chemical engineering, with an emphasis in colloids, polymers and surfaces, from CMU in 1997. Her lecture was entitled "The Formula for Building a Rewarding Career and Rich Innovation Culture."

The Art Westerberg Seminar was given in September by Jennifer Sinclair Curtis, Distinguished Professor of Chemical Engineering and Dean of the College of Engineering at the University of California at Davis. The recipient of numerous academic awards, Prof. Curtis is a graduate of Purdue and Princeton Universities. Her particulate flow models have been extensively adopted by both commercial and open source computational fluid dynamics (CFD) software packages. Pictured below with Emeritus Professor Art Westerberg, for whom the lectureship is named, Curtis spoke about "Granular Flows of Flexible Fibers Using the Discrete Element Method."

The Center for Complex Fluids Engineering Mini-Symposium took place on June 1 in Doherty Hall and was hosted by Prof. Bob Tilton. Six PhD candidates and post-docs presented material in preparation for the ACS Colloid & Surface Science Symposium. In addition, the symposium was an opportunity for the various groups to learn more about ongoing research efforts on campus.
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Date of Seminar</th>
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</thead>
<tbody>
<tr>
<td>WESTERBERG LECTURE</td>
<td>Jennifer Sinclair Curtis Granular Flows of Flexible Fibers using the Discrete Element Method</td>
<td>September 18, 2018</td>
</tr>
<tr>
<td>CASASSA LECTURE</td>
<td>Lilo Pozzo Nano-Emulsion design, synthesis and applications in medicine</td>
<td>September 27, 2018</td>
</tr>
<tr>
<td>*Lilo Pozzo</td>
<td>University of Washington Kitchen Engineering: from fine dining to modern technology</td>
<td>September 28, 2018</td>
</tr>
<tr>
<td>Joanathan Dordick</td>
<td>Rensselaer Polytechnic Institute Remote Control of Cells: From Biomanufacturing Human Therapeutics</td>
<td>October 2, 2018</td>
</tr>
<tr>
<td>Ann Marie Carlton</td>
<td>University of California, Irvine Controlling biogenic secondary organic aerosol: a valentine to the Clean Air Act</td>
<td>October 9, 2018</td>
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<tr>
<td>ChEGSA SYMPOSIUM</td>
<td>Linda Broadbelt Northwestern University The Confluence of Kinetic Modeling and Data Science</td>
<td>October 25, 2018</td>
</tr>
<tr>
<td>ChEGSA SYMPOSIUM</td>
<td>David Miller National Energy Technology Lab TBA</td>
<td>October 26, 2018</td>
</tr>
<tr>
<td>COVESTRO LECTURE</td>
<td>Prodromos Daoutidis University of Minnesota Controlling and Optimizing Complex Plants: New Perspectives from Network Theory</td>
<td>November 15, 2018</td>
</tr>
<tr>
<td>Ali Mesbah</td>
<td>University of Michigan Model-Based Feedback Control of Atmospheric Pressure Plasma Jets for Plasma Medicine</td>
<td>December 6, 2018</td>
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</table>
Save the Date—Upcoming Events

The Technical Opportunities Conference (TOC) is to be held on September 24 - 26, 10 am– 5 pm in the CUC. For more than 40 years, the TOC has been the largest job fair on Carnegie Mellon's campus, focusing specifically on technical employment. It is run by the Society of Women Engineers (SWE), a student organization on campus, and is supported by the College of Engineering.

The AIChe Annual Meeting will be held this year in Pittsburgh at the David L. Lawrence Convention Center on October 28 - November 2, 2018. On Sunday, October 28 we will have a reception for alumni and friends of the department in the Singleton Room, Roberts Hall. The Cocktail Reception is from 6-7:30 pm, followed by a buffet dinner from 7:30-9:30 pm. On Tuesday, October 30 we are hosting a dessert & cocktail reception from 9:00-11:00 pm at the Westin Convention Center, Allegheny Grand Ballroom 1.

The next Enterprise Wide Optimization meeting will be held in conjunction with the AIChe Annual Meeting on November 1-2, 2018 at the Westin Hotel, adjacent to the Convention Center. Approximately 45 people are expected to attend.

The 40th Annual ChEGSA Symposium will be held on Thursday and Friday, October 25 and 26, 2018. This year’s Dow Chemical keynote speaker is Linda Broadbelt of Northwestern University, who will be speaking on Thursday, October 25. On Friday, October 26, David Miller of NETL will give the ExxonMobil keynote address. Information regarding the schedule, abstract deadline and judging requests are available on the ChEGSA Symposium website (chegsa.cheme.cmu.edu/symposium/)
Alumni News

The following alumni have won NSF Career Awards: multi-year grants to advance their research:

Victor Zavala (PhD, ChemE '08) Associate Professor at the University of Wisconsin.

Maureen Tang (BS, ChemE '07) Assistant Professor of Chemical & Biological Engineering at Drexel University.

Chris Wirth (PhD, ChemE '12) Assistant Professor of Chemical & Biomedical Engineering at Cleveland State University.

Kristina Wagstrom (PhD, ChemE '09) Assistant Professor of Chemical & Biomolecular Engineering at the University of Connecticut.
Other Alumni News:

Donna Blackmond, (PhD, ChemE '84) Professor of Chemistry at Scripps Research Institute, was recently awarded the Catalysis Society's Irving Wender Award for Excellence in Catalysis.


Qi Zhang (PhD, ChemE '16) is now an Assistant Professor of Chemical Engineering & Materials Science at the University of Minnesota.

Stratos Pistikopoulos  (PhD, ChemE '88) Professor of Chemical Engineering at Texas A&M University has been named Director of the Texas A&M Energy Institute.
Prateek Mehta (MS, ChemE '13) a current graduate student at the University of Notre Dame has just received the 2018 UND Research Center Award for Computation and Visualization.

Nicolette Louissaint (BS, ChemE '06) is now the Executive Director of Healthcare Ready, a not-for-profit organization that strengthens healthcare supply chains through collaboration with public health and private sectors before, during and after disasters.

Recent grad Emily Carvalho has been awarded a National Science Foundation Graduate Research Fellowship. This prestigious award was based on her demonstrated potential to contribute to strengthening the vitality of the U.S. science and engineering enterprise, and will support her Ph.D studies in Chemical Engineering at UC-Berkeley beginning this Fall.

John L. Anderson, who was Department Head here from 1983-94, and President Emeritus and distinguished Professor of Chemical Engineering at Illinois Institute of Technology, has been nominated (as the sole candidate) to be the next National Academy of Engineering President.
Alum Kathryn Kukla (ChemE’12) brought her dog as a guest and Shelley Anna chatted with Joann Truchan (ChemE’96) and James Petka (ChemE’15) at our department-sponsored ice cream social during Spring Carnival in April 2018.
Faculty Profile

Anne Robinson

I will officially join the department in November 2018 – I’m looking forward to getting to know more current CMU students and alumni! I grew up in Ft. Lauderdale, then moved “up north” for college to attend Johns Hopkins. After several changes of majors, I was convinced by a friend to try chemical engineering; it turned out to be a perfect match for my interests and abilities, and I’ve enjoyed being a part of this exciting field ever since. I got my PhD at University of Illinois, Champaign-Urbana as a student of Doug Lauffenburger and Dane Wittrup, and did a postdoc at MIT with Jon King in Biology. I joined the faculty at the University of Delaware in 1997, then moved to Tulane to become Department Chair in 2012.

I have always been fascinated by the speed at which biological systems seem to function, and the robustness (generally) of those systems compared to human-engineered ones. This interest has driven my research at the interface of biology and engineering. As an undergrad at Hopkins I was inspired to study biochemical engineering by Bob Kelly (now at NC State), who was studying the proteins and microbiology of cells that grow in extreme conditions, such as the 60-80°C water in the hot springs at Yellowstone. Understanding how proteins could stay folded and compact under conditions most life considers too harsh opened ideas about what biology was capable of that I never considered previously. Doing research as an undergraduate changed my career plans – I found research, and the idea of solving problems no one knew the answer to, captivating and so decided to pursue a Ph.D. I encourage all students to try out both research and industrial internships, as these options offer exposure to new fields and different scientific/engineering environments and can provide transformative experiences that inform life-long decision-making.

Since that early work, my interests have followed two major paths – trying to understand how protein folding (formation of the intricate, biologically active 3D structures), happens in a cell (versus a test tube) and understanding how misfolding can lead to human disease. Folding in the cell is typically very robust – a phenomenon that is especially impressive since it takes place in an environment where there may be thousands of potential disruptive interactions with other macromolecules and the total protein concentration leads to a gelatin-like viscosity. However, when biochemical engineers try to overproduce a protein of interest, like an antibody (as a therapeutic agent or research tool), improper interactions may lead to misfolding or poor protein quality. Therefore, we often need to identify and/or develop approaches to improve yields or activity of our product, through cellular or protein engineering. Similarly, many drug targets - like membrane receptors – are difficult to produce and harder to characterize structurally;
understanding membrane protein-lipid and membrane protein-protein interactions and developing cellular screening tools for binding to small molecule targets can improve drug discovery efforts. Our laboratory is interested in cellular engineering approaches to improve expression, developing novel cellular screens, and biophysical characterization of membrane protein interactions.

One of the largest biomedical challenges we face in the next decade is the epidemic growth of Alzheimer’s disease and other dementias. Currently, 5.7 million people in America are suffering from Alzheimer’s disease, and that number is expected to increase to 14 million over the next 20 years. To date, there are no therapeutic interventions. The only approved drugs to treat Alzheimer’s disease (cholinesterase inhibitors and the N-methyl-D-aspartate (NMDA) receptor antagonists) at best only modestly improve cognitive function and quality of life; they do not treat the underlying cause(s) of the disease. We are interested in understanding how misfolding and dysfunction of the tau protein contributes to disease, identifying the specific mechanisms for misfolded tau propagation across cells in the brain, and developing novel therapeutic targets.

Social Media

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Like us on FACEBOOK: http://www.facebook.com/cmucheme

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

Watch the following:

Zachary Ulissi: Designing New Molecules with Machine Learning:
https://youtu.be/R5AaK4kqeDg

Others of interest from CIT:

Carnegie Mellon University Deluxe Tour!!! by Squeege O'Bannon
https://www.youtube.com/watch?v=HyaubhlcwJM