Purdue University
School of Chemical Engineering
2012 – 2013 Year in Pictures
Vision: Be widely recognized among the premier ranks of chemical engineering programs in the world.

Mission: Provide students with a rigorous and relevant education, conduct field-defining research, and enhance the School’s global impact.

Values: Leadership, excellence and innovation, relevance and impact, commitment and responsibility, teamwork and partnership, diversity and respect, safety and sustainability.
ChE Strategic Plan 2010 – 2014

- **Research:** To pursue breakthrough research that extends the boundaries of chemical engineering into areas which promote sustainability and which will have the greatest positive impact on our global society.

- **Education:**
  - **Graduate Programs:** Recruit and retain high caliber graduate students from top-tier chemical engineering programs, provide challenging and relevant research programs, and a quality graduate level education.
  - **Undergraduate Programs:** Recruit and retain the most capable, motivated and diverse class of undergraduates, and help them to obtain a solid and relevant education throughout their Purdue experience.

- **Global Impact:** Educate undergraduate and graduate students who will be successful in a global environment. Cultivate and expand research relationships with prominent international research organizations.
ChE Strategic Plan 2010 – 2014 continued

- **Development:** Secure and improve the School’s financial foundation as a means to continually improve its programs and physical facilities, while balancing short and long term goals.

- **Engagement:** Encourage faculty, students and staff to develop a sense of personal responsibility and accountability for service at both the local and national levels. Promote entrepreneurial activity, leading to intellectual property, including invention disclosures and patents. Become a leader in sustainability on the Purdue campus.

- **Professional Development and Recognition:** Encourage all faculty, staff, and students to participate in activities that will enhance their career, develop their skills, and help them become more creative and productive. Actively promote recognition by internal and external award nominations.

- **Culture and Environment:** Create an environment where faculty, staff, and students are treated with respect and where superior teamwork is achieved. Enhance and expand safety activities and safety education.
Mitch Daniels Joins as Purdue’s 12th President!

Governor of the State of Indiana, 2004-2012

BA, Princeton, 1971
JD, Georgetown, 1979
Purdue ChE School Parameters

Founded 1911

Forney Hall 90,750 sf

541 Undergraduate Students

142 Graduate Students

27 Staff

31 faculty
Although ChE students accounted only for 9% of the fall 2012 enrollment in the College of Engineering, they received 16% of the total Presidential and Trustees Scholarships in the College.

30% of all ChE undergraduate students receive Presidential and Trustees Scholarships (fall 2013).

64% of our undergraduate students have a GPA of 3.2 or
Purdue ChE Degrees Conferred
Chemical Engineering Faculty

Rakesh Agrawal
ScD, MIT, 1980

Osman A. Basaran
PhD, Minnesota, 1984

Stephen P. Beaudoin
PhD, NC State, 1995

Bryan W. Boudouris
PhD, Minnesota, 2009

James M. Caruthers
ScD, MIT, 1977

David S. Corti
PhD, Princeton, 1997

Elias I. Franses
PhD, Minnesota, 1979

Raj P. Gounder
PhD, UC Berkeley, 2011

Robert E. Hannemann
MD, Indiana, 1959
Chemical Engineering Faculty

Michael T. Harris
PhD, Tennessee-Knoxville, 1992

R. Neal Houze
PhD, Houston, 1968

Jeffrey P. Greeley
PhD, Wisconsin Madison, 2004

James D. Litster
PhD, Queensland, 1985

Julie C. Liu
PhD, Caltech, 2006

John A. Morgan
PhD, Rice, 1999

Zoltan K. Nagy
PhD, Babes-Bolyai, 2001

Joseph F. Pekny
PhD, Carnegie Mellon, 1989
Chemical Engineering Faculty

R. Byron Pipes
PhD, Texas-Arlington, 1972

Doraiswami Ramkrishna
PhD, Minnesota, 1965

Gintaras V. Reklaitis
PhD, Stanford, 1969

Fabio H. Ribeiro
PhD, Stanford, 1989

Kendall T. Thomson
PhD, Minnesota, 1999

Arvind Varma
PhD, Minnesota, 1972

Nien-Hwa Linda Wang
PhD, Minnesota, 1978

Phillip C. Wankat
PhD, Princeton, 1970
Chemical Engineering Faculty

You-Yeon Won
PhD, Minnesota, 2000

Yue Wu
PhD, Harvard, 2006

Chongli Yuan
PhD, Cornell, 2007

Ernesto Marinero
Professor of Engineering Practice
PhD Heriot-Watt, 1977

Enrico Martinez
Visiting Professor
PhD Notre Dame, 1972

Jeffrey J. Siironla
Professor of Engineering Practice
PhD Wisconsin Madison, 1970
Chemical Engineering Emeritus Faculty

Ronald P. Andres
PhD, Princeton, 1962

W. Nicholas Delgass
PhD, Stanford, 1969

Robert A. Greenkorn
PhD, Wisconsin, 1957

Nancy W. Y. Ho
PhD, Purdue, 1968

George T. Tsao
PhD, Michigan, 1960
Recent Faculty Additions

Jeff Greeley  
Associate Professor  
Joined Spring 2013

B. S., University of Texas-Austin, 1997  
Ph. D., University of Wisconsin-Madison, 2004  
Postdoctoral Fellow, Technical University of Denmark, 2004 - 2006

**Research Interests:** New engineered materials for metal and oxide catalysts, fuel cells, electrolyzers, and batteries

Raj Gounder  
Assistant Professor  
Joined Fall 2013

B. S., University of Wisconsin, 2006  
Ph. D., University of California, Berkeley, 2011  
Postdoctoral Fellow, California Institute of Technology, 2011 - 2013

**Research Interests:** synthesis of inorganic catalysts with tailored properties, the characterization of catalyst active site and support structures, and the evaluation of catalytic function using fundamental kinetic and mechanistic descriptors.
Recent Faculty Additions

Carl Laird
Associate Professor
To join Spring 2014

Research Interests: Large-scale nonlinear optimization, parameter estimation, and parallel computing.

B.Sc., University of Alberta, 2000
Ph.D., Carnegie Mellon University, 2006

Vilas Pol
Associate Professor
To join Spring 2014

Research Interests: Electrochemical engineering, nanoparticle technology, materials science, energy storage devices and environmental technology

B.Sc., Pune University, India, 1996
Ph.D., University of Bar-Ilan, Israel, 2005
Post-Doctoral Research Associate, 2008-10; Research Scientist, 2010-present, Argonne National Laboratory
Unit Operations Lab Before Renovation
Unit Operations Lab Before Renovation
2012 College of Engineering Staff Awards:
Cristina Farmus, Staff Leadership Award

Klod Kokini, Karen Heide, Arvind Varma, Cristina Farmus, Enrico Martinez,
Leah Jamieson, Jennifer Mamph, Miren Martinez, Jimmy Mamph

November 2012
December 2012 Graduation
College of Engineering - 2013
Distinguished Engineering Alumni Awards

February 2013
“It’s very special because I consider Purdue the starting point of my engineering profession. It was there I took an elective course in nuclear engineering that inspired me to pursue my graduate degrees in nuclear engineering”

-Henry T. Sampson, first African American to earn a PhD in nuclear engineering in the U.S.
College of Engineering
2013 Distinguished Engineering Alumni Awards

Dean Leah Jamieson and Robert Weist (BS 1962)

“I am honored to be a recipient of the Distinguished Engineering Alumnus Award. It is unexpected. I take pride in this award. I continue to be pleasantly surprised at the many different parts of the University that exist and that contribute in positive ways to the whole Purdue experience”

-Robert D. Weist

February 2013
Study Abroad

Purdue ChE
Undergraduate Students
in front of the
Temple of Heaven,
China

February 2013
Industrial Advisory Council, Spring 2013 Meeting

Houston, Texas

March 2013
Industrial Advisory Council, Spring 2013 Meeting

Houston, Texas
Industrial Advisory Council, Spring 2013 Meeting

Houston, Texas
AIChE Chem-E Car
Regional Competition
Graduate Colloquium

April 2013
Anheuser Busch Plan Tour, St. Louis

April 2013
Women in ChE Seminar

Lindsay Williams (BS 2010), Professor Linda Wang, Susan Hardman (BS 1983), Claire Chandler (BS 1982)
Senior Banquet

Arvind Varma
R. Games Slayter Distinguished Professor
Jay and Cynthia Ihlenfeld Head of Chemical Engineering
Senior Banquet
Arvind Varma and students
Michael F. Doherty

Professor of Chemical Engineering
and Department Chair
University of California
Santa Barbara

2013 KELLY LECTURES

» RAPID PROCESS DESIGN: SORTING THE WHEAT FROM THE CHAFF
Tuesday, April 16, 9:00–10:15 a.m. • Room G140, Forney Hall

» CRYSTALS ARE LIKE PEOPLE: GROWTH AND DEFECTS ARE WHAT MAKE THEM INTERESTING
Wednesday, April 17, 11:30 a.m.–12:30 p.m. • Room 3059, Forney Hall
Karen Heide (Secretary) recognized for 25 years of Service in Chemical Engineering, pictured with Arvind Varma
Spring 2013
End of Semester Appreciation Reception

Teresa Cadwallader (Administrative Assistant) received the 2013 ChE Staff Excellence Award, pictured with James Litster.
Recent Faculty Honors – International

Sangtae Kim
Distinguished Professor
received the
2013 Ho-Am Prize
Engineering
Korea

Arvind Varma, Head, Chemical Engineering
Leah H. Jamieson, Dean, College of Engineering
Sangtae Kim, Distinguished Professor
Mitchell E. Daniels, President, Purdue University

June 2013
2013 New ChE Graduate Students Picnic
Professor Michael Harris, Jennifer Sinclair Curtis (BS '83), Arvind Varma, and Ron Unnerstall (BS '83), and Professor Osman Basaran
2013 OChE Awards

Professor Michael Harris, Jennifer Sinclair Curtis (BS ’83), Arvind Varma,
2013 OChE Awards

Professor Osman Basaran, Ron Unnerstall (BS ’83), Arvind Varma
Unit Operations Laboratory Upgrade

- Upgrade the Unit Operations Laboratory (Sr. Lab) in Forney Hall – completed summer 2013. This overhaul was needed so that our students can be educated using laboratory equipment and experiments designed for today’s industrial reality.

- $550K was raised to complete the needed upgrade from alumni, corporate support, faculty, and Purdue Repair and Rehabilitation funds.

- $1 million endowment created by Alan Fox (BSChE ’55) for lab maintenance and upgrades in the future; naming Sep 13, 2013.
Unit Operations Lab Inauguration

Alan H. Fox (BS ’55) and Arvind Varma

September 2013
Industrial Advisory Council, Fall 2013 Meeting

September 2013
2013-14 Graduate Student Organization Officers

**President**  
Frank DeVilbiss

**Vice President/Treasurer**  
Caitlin Schram
2013-14 Graduate Student Organization Officers

First-Year Representative
Mark Koeper

Student Advocacy Officer
Bethlehem Negash

Inter-GSO Events Committee Representative
Holly Chan
2013-14 Graduate Student Organization Officers

**Purdue Graduate Student Government Representative**
Shankali Pradhan

**Social Events Committee Co-Chairperson**
Pritish Kamat

**Sports Events Committee Co-Chairperson**
Jamie Harris
2013-14 Graduate Student Organization Officers

Outreach Committee Chairperson
Nicole Devlin

Co-Curricular Committee Chairperson
Agnes Mendonca

Sustainability Committee Chairperson
Rohit Jaini
2013-14 Graduate Student Organization Officers

Safety Committee Chairperson
Kaiwalya Sabnis

2013 GSO Event List
Graduate Research Symposium
Volleyball Tournament
Indoor Soccer Tournament
Halloween Extravaganza
Truth and Beauty Seminar
Block Party
Salsa Dancing
Quiz Bowl
2013 GSO Symposium
2013 GSO Symposium Awards

Oral Presentations

First Place: **Anuj Verma**
“Development of a new method to detect Cu ion clustering in Cu-SSZ13 for DeNOx applications”

Second Place: **Vinod Kumar Venkatakrishnan**
“Lab-scale process development for high-pressure fast-hydropyrolysis and catalytic hydrodeoxygenation for production of liquid fuel from biomass”

Third Place: **Aniruddha V. Kelkar**
“On a collision course... Prediction and Control of Particulate Aggregation and Deposition in Dispersion Flows”

Honorary Mention: **Dhairya Mehta**
“Millisecond timescale hydropyrolysis of cellulose and Vapor-phase hydrodeoxygenation kinetics of furfural”

Aniruddha Kelkar and Arvind Varma
2013 GSO Symposium Awards

Poster Presentations

First Place: Mary Jane Brennan
“Adhesive elastomeric proteins as soft tissue surgical glues”

Second Place: Agnes Mendonca
“5-hydroxymethylation of cytosine has a sequence dependent effect on nucleosomal stability”

Third Place (tie): Rohit Jaini & Longyun Guo
“Improving biofuel production by kinetic modeling of lignin metabolism”

Third Place (tie): Gregory Honda
“Hydrodynamics of Trickle-Bed reactors with Particle Size Distribution”

Greg Honda and Arvind Varma
2013 ChE Scholarship Recipients

• Mark Apicella
• Adam Barth
• Kurtis Bergman
• Brandon Biega
• Kevin Bock
• Adam Broski
• Jefrey Bush
• Joshua Clark
• Candace Corso
• Jacob Eisses
• Isaura Frost
• Andrew Furthmiller
• Philip Gase
• Markus Graf
• Jacob Haines
• Karina Halim
• Nathan Handley
• Matthew Jahns
• Thomas Kilyk
• Andrew Kuhn

• Eric Lehmann
• Timothy Lehnert
• Paul Littlejohn
• Pedro Lodise
• Haefa Mansour
• Daniel Midkiff
• Michael Monte
• Justin Nauman
• Alicia Newcomer
• Andrew Nguyen
• Viet Nguyen
• Uhunnoma Ogbeifun
• Jonathan Pfluger
• Frank Pirok
• Richard Roberson
• Heather Robinson
• Brent Rogers
• Ankur Sarkar
• Adam Slagle
• Ashley Stroup

• Krista Stump
• Emily Thomas
• Alejandro Villanueva
• Kory Wait
• Yunjie Wang
• Nathan Wright
2013 Scholarship Reception

October 2013
Graduate Student Organization Halloween Extravaganza

October 2013
Congratulations to ChE Alumni

**Kristi Anseth (BS ‘92)**
Elected Member of the National Academy of Sciences
James E. Bailey Award, AIChE, 2013

**Chris Bowman (BS ChE ‘88, PhD ’91)**
Named Distinguished Professor
University of Colorado
Congratulations to ChE Alumni

Bruce E. Dale (PhD ‘79)
Named Distinguished Professor
University of Michigan

Anthony Lowman (PhD ‘97)
Named Dean of Engineering
Rowan University
Congratulations to ChE Alumni

Steven R. Lustig (MS ‘85, PhD ‘89)
Industrial Research & Development Award
AIChE, 2013

E. Terry Papoutsakis (MS ‘77, PhD ‘90)
D.I.C. Wang Award for Excellence in Biomedical Engineering
AIChE, 2013
Congratulations to ChE Faculty

Rakesh Agrawal
IIT-Kanpur Distinguished Alumnus Award, 2013
Elected Member of the American Academy of Arts and Sciences, 2013

Nicholas Delgass
Elected Fellow of AIChE
Received the 2013 Herman Pines Award in Catalysis
Congratulations to ChE Faculty

**Fabio Ribeiro**
Named R. Norris and Eleanor Shreve Professor of Chemical Engineering

**Arvind Varma**
Warren K. Lewis Award
AIChE, 2013
Congratulations to ChE Graduate Students

Kaoutar Abbou Oucherif
Graduate Student Symposium in Manufacturing Science & Engineering Award, AAPS, 2013

David Acevedo
National Science Foundation Graduate Research Fellowship, 2013
Congratulations to ChE Graduate Students

Mary Jane Brennan
Travel Award, Women’s Initiatives Committee
AIChE, 2013

Nathan B. Davis
2013 Magoon Award, College of Engineering, Purdue
Congratulations to ChE Graduate Students

**Danni Gao**
Second Place, American Chemical Society Great Lakes Chapter Poster Competition, 2013
Travel Award, Women’s Initiatives Committee, AIChE, 2013
Young Researcher Award, NASCRE-3 Conference, 2013

**Emre Gencer**
Committee Education of Teaching Assistants Award, 2013
Purdue Global Policy Research Institute Fellowship, 2013
Congratulations to ChE Graduate Students

**Anshu Gupta**
First Place, Indiana Soybean Alliance Competition, 2013

**Charles Hages**
Travel Award, Energy Materials Forum, MRS, 2013
Congratulations to ChE Graduate Students

Laura J. Hirschfield (PhD 2013)
2013 Magoon Award, College of Engineering, Purdue

Gregory Honda
Best Presentation Award, Annual Meeting, AIChE, 2012
Young Researcher Award, NASCRE-3 Conference, 2013
Travel Award, Catalysis and Reaction Engineering (CRE) Division, AIChE, 2013
Congratulations to ChE Graduate Students

**Elcin Icten**
IN-MaC Graduate Fellowship, Indiana Next Generation Manufacturing Competitiveness Center, 2013-15

**Aniruddha Kelkar**
Outstanding Service and Scholarship Award, Purdue 2013
Congratulations to ChE Students

Dharik Mallapragada
Best Presentation Award, AIChE Annual Meeting, 2012

Haefa Mansour (junior)
First Place, SURF Poster Competition, Purdue, 2013
Congratulations to ChE Students

**Daniel Pohlman**
2013 Magoon Award, College of Engineering, Purdue 2013

**Ankur Sarkar (Junior)**
NIST SURF Fellowship, University of Colorado
Congratulations to ChE Graduate Students

**Erik Sheets**
Excellence for Undergraduate Teaching Assistant, Purdue 2013

**Meenesh Singh (PhD 2013)**
Outstanding Research Award, College of Engineering, Purdue, 2013
Process Development Division Student Paper Award, AIChE, 2013
Congratulations to ChE Graduate Students

**Renay Su**
Third Place, American Chemical Society Great Lakes Chapter Poster Competition, 2013
Bilsland Dissertation Fellowship, College of Engineering, Purdue, 2013

**Sara Yohe**
Kokes Award, 23rd North American Catalysis Society, 2013
2013 ChE Undergraduate Student Awards

Brent Bishop
• George T. Tsao Award

Adam Broski
• Stephen Craig Award

Candace Corso
• Lindsay Anne Williams Award

Brooke Elliott
• George T. Tsao Award

Philip Gase
• Undergraduate Research Award

Lee-Wei Kao
• George T. Tsao Award

Christina Karl
• Omega Chi Epsilon Award

Eric Lehmann
• George T. Tsao Award

Haefa Mansour
• First Place, SURF Poster Competition, Purdue, 2013

Rafid Mustafa
• John Clarence Lottes Memorial Award

Jonathan Pfluger
• Undergraduate Research Award

Ankur Sarkar
• George T. Tsao Award
• NIST SURF Fellowship, University of Colorado, 2013

Amanda Taylor
• AIChE Award
Congratulations to ChE Undergraduate Students!

Senior Design Project Award Teams

• Perry Helmer
• Aidan Light
• Benjamin Orkiszewski
• Karis Viars Waibel
• Joshua Andrejko
• Jacob Haines
• Evan Hanley
• Samuel Stuckey
• Anna Sullivan
• Markus Graf
• Stephanie Kennedy
• Paul Sabol
• Rebekah Steele
# Purdue ChE Research by Fundamental Topic Area

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<th>Topic Area</th>
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<tr>
<td>Biochemical and Biomolecular Engineering</td>
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<td>Catalysis and Reaction Engineering</td>
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<td>Fluid Mechanics and Interfacial Phenomena</td>
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<td>Mass Transfer and Separations</td>
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<tr>
<td>Nanoscale Science and Engineering</td>
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<tr>
<td>Polymers and Materials</td>
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<tr>
<td>Product and Process Systems Engineering</td>
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<tr>
<td>Thermodynamics, Molecular and Nanoscale Modeling</td>
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<td>Application Area</td>
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<tr>
<td>Biotechnology</td>
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<td>Electronics</td>
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<td>Energy</td>
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<td>Pharmaceuticals</td>
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<td>Polymers and Advanced Materials</td>
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<td>Security</td>
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Graduate Students Edward Tomlinson, Holly Chan and Lizbeth Rostro in Professor Boudouris’ Research Lab
Research Focus

Ryan Mulvenna (Graduate Student) in Professor Boudouris’ Research Laboratory
Purdue ChE Industrial Affiliates

3M  abbvie  Abbott  AIR LIQUIDE
bp  Air Products  ANHEUSER BUSH
Chevron Phillips Chemical Company LP  CountryMark
DuPont  EASTMAN  ExxonMobil
Honeywell  Lilly  Lubrizol  Pfizer
PHILLIPS 66  P&G  Shell  UOP
Recent Development Success

- Jay (BSChE ’74) and Cynthia Ihlenfeld Headship
- Strategic Initiatives Endowment Fund
- 2 Named Professorships in Chemical Engineering
- Graduate Education Match Funds

Jay Ihlenfeld
Thank you!