



Centennial Celebration  
A Century of People and Progress

1911-2011

# Purdue School of Chemical Engineering

2011 – 2012 Year in Pictures

# Governor Mitch Daniels selected as Purdue's 12<sup>th</sup> President!



## **Mitch Daniels**

BA with honors, Princeton, 1971

JD, Georgetown, 1979

- **Principal Prior Positions:**

- Chief of Staff, Senator Lugar, 1977–82

- Political appointments, DC, 1983-87

- President and CEO, Hudson Institute, 1987-90

- Eli Lilly, corporate leadership positions, last as Senior VP for Corporate Strategy and Policy, 1990-2001

- Director - OMB, 2001-03

- 49<sup>th</sup> Governor of Indiana - elected 2004, re-elected 2008

- To join Purdue January 1, 2013

- Provost Tim Sands serving as Acting President, July 15 - December 31, 2012.



# CENTENNIAL CELEBRATION

School Established: June 14, 1911

## Planning Committee (13)

- ❖ Faculty
- ❖ Alumni/IAC members/Industry Representatives
- ❖ Staff
- ❖ Students (GSO and ChE-SAC Presidents)

## Events

- ❖ Centennial Seminars
- ❖ Publish Two Books on School History
- ❖ **Main Event: October 7 - 8, 2011**



# SCHEDULE OF EVENTS

## Friday, October 7, 2011

- 1:00 Welcome Address
- 1:15 Centennial Lectures
- 2:30 Panel Discussions
- 3:45 Sculpture Unveiling
- 4:00 Poster Session
- 5:00 Adjourn
- 6:30 Reception and Dinner
  - Speaker: Dr. Robert Forney

## Saturday, October 8, 2011

- Forney Hall and Discovery Park Tours
- Pregame reception in Henson Atrium
- Football Game – Purdue vs. Minnesota (**PU-45, MN-17**)



100 Years of  
Chemical Engineering  
at  
Purdue University  
1911-2011

Phillip C. Wankat  
Nicholas A. Peppas



School of Chemical Engineering • Purdue University

A Pictorial History of the  
SCHOOL OF CHEMICAL ENGINEERING AT  
PURDUE UNIVERSITY



*Phillip C. Wankat and Cristina D. Farmus*

PURDUE  
UNIVERSITY



# Nicholas Peppas, Former Purdue ChE Professor, Delivering the Academic Lecture

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Robert Weist (BSCHE 1962, OChE 2005)  
Delivering the Entrepreneurship Lecture

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Paul Oreffice (BSCHE 1949, HDR 1976, OChE 1993)  
Delivering the Industry Lecture via Skype,  
Introduced by Professor Reklaitis

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Marilyn Glenn Forney (BSChE 1947) and  
Robert Forney (BSChE 1947, PhD 1950, DEA 1974, HDR 1981)

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# Industry Panelists

Ronna Robertson (BSChE 1992),

Rick Roberts (BSChE 1976, OChE 2004, DEA 2007),

Michael Ramage (BSChE 1966, PhD 1971, DEA 1986,  
OChE 1993, HDR 1996)

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Sinclair Group - '09 - present  
Senior VP Global Engagement Lead





## Academia Panel

Abbie Griffin (BSChE 1974, OChE 2000),  
Duncan Mellichamp (PhD 1964, OChE 2007),  
Jamey Young (PhD 2005),  
Tony Mikos (MS 1985, PhD 1988, OChE 2008 )





# Entrepreneurship Panel

Professor Rakesh Agrawal,

Linda Huff (BSChE 1970, OChE 1991, DEA 2000),

Timothy McGinley (BSChE 1963, DEA 1972, OChE 1993, HDR 2010),

Donald Dunner (BSChE 1953, OChE 2001, DEA 2001),

Gerald Skidmore (BSChE 1954, OChE 2011)



**Right Face: Story of a Successful Career in Patent Law**

1. Decision to combine #1 & 2 and to pursue a career in patent law.
2. Employed as patent examiner in U.S. Patent Office (1955-1956) and then as a law clerk for the Chief Judge of the U.S. Court of Customs and Patent Appeals (1956-1958).
3. Simultaneously w/ #5, attended night law school at Georgetown University (1955-1958).
4. Commenced work as attorney in first of several patent law firms (1958), joining present firm (1978) as the 30<sup>th</sup> lawyer and participating in its growth to about 400 lawyers today.
5. In the interim, authored/coauthored two legal texts, wrote countless legal articles and gave numerous legal speeches, taught law as an adjunct professor at two law schools, served as chair/president of two local and two national patent law associations, and tried numerous patent cases and argued over 100 patent appeals (1958 - present).

**U.S. R. DUNNER (Cont'd)**

**Left Face: Story from Paribus: Career Freshman to a Successful Career in Patent Law**

1. Introduction to Patents in their first Freshman Client course (1949).
2. Exposure to multiple technologies as a Client student (1949-1951).
3. Developed keen interest in communicating & advising through participation in Student Government and as a member of the Student Government Executive Board (1951-1952).
4. Decision to combine #1's 2 and 3 by pursuing a career in patent law (ca. 1952).
5. Employed as patent examiner in U.S. Patent Office (1955-1956) and then as a law clerk for the Chief Judge of the U.S. Court of Customs and Patent Appeals (1956-1958).
6. Simultaneously w/ #5, attended night law school at Georgetown University (1955-1958).
7. Commenced work as attorney in first of several patent law firms (1958), joining present firm (1978) as the 30<sup>th</sup> lawyer and participating in its growth to about 400 lawyers today.
8. In the interim, authored/coauthored two legal texts, wrote countless legal articles and gave numerous legal speeches, taught law as an adjunct professor at two law schools, served as chair/president of two local and two national patent law associations, and tried numerous patent cases and argued over 100 patent appeals (1958 - present).



# Undergraduate Student Volunteers: Jenna Ellis, Karis Viars, Jackie Maday and Zoanne Zweber



Several recognitions were given, and plans for the 1957-58 ACME President Chemical Engineers of the State of Indiana were discussed.

Several recognitions were given, and plans for the 1957-58 ACME President Chemical Engineers of the State of Indiana were discussed.

ACADEMIC GRADUATES	
1 University of Michigan - Ann Arbor	113
2 Purdue University	106
3 University of Texas - Austin	91
4 Georgia Institute of Technology	98
5 Wayne State University	94
6 Pennsylvania State University	93
7 University of Puerto Rico - Mayaguez	91
8 University of California - Berkeley	85
9 Cornell University	84
10 North Carolina State University	79
1 Massachusetts Institute of Technology	43
2 Georgia Institute of Technology	37
3 University of Texas - Austin	29
4 Northwestern University	24
5 Purdue University	24
6 University of Wisconsin - Madison	19
7 University of Illinois - Urbana-Champaign	18
8 University of Minnesota	18
9 Northwestern University	17
10 Cornell University	16
11 Rensselaer Polytechnic Institute	16
12 Wayne State University	16

Journal, September 13, 2010

Recruiter's Survey

Rankings for the work

4<sup>th</sup> in the US

2<sup>nd</sup> in the



# President Córdova with ChE School Head Arvind Varma and Michael Graff (MS 1979)

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# Unveiling the "Evolution" Sculpture





Lloyd and Steven Brewer (BSChE 1970),  
Linda Huff (BSChE 1970, OChE 1991, DEA 2000), James Huff (BSChE  
1970), Ruth Ann and Thomas Gallant (BSChE 1970)





# Members of the Class of 2010 with Professors Liu and Thomson

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# Dinner in the North Ballroom, Purdue Memorial Union

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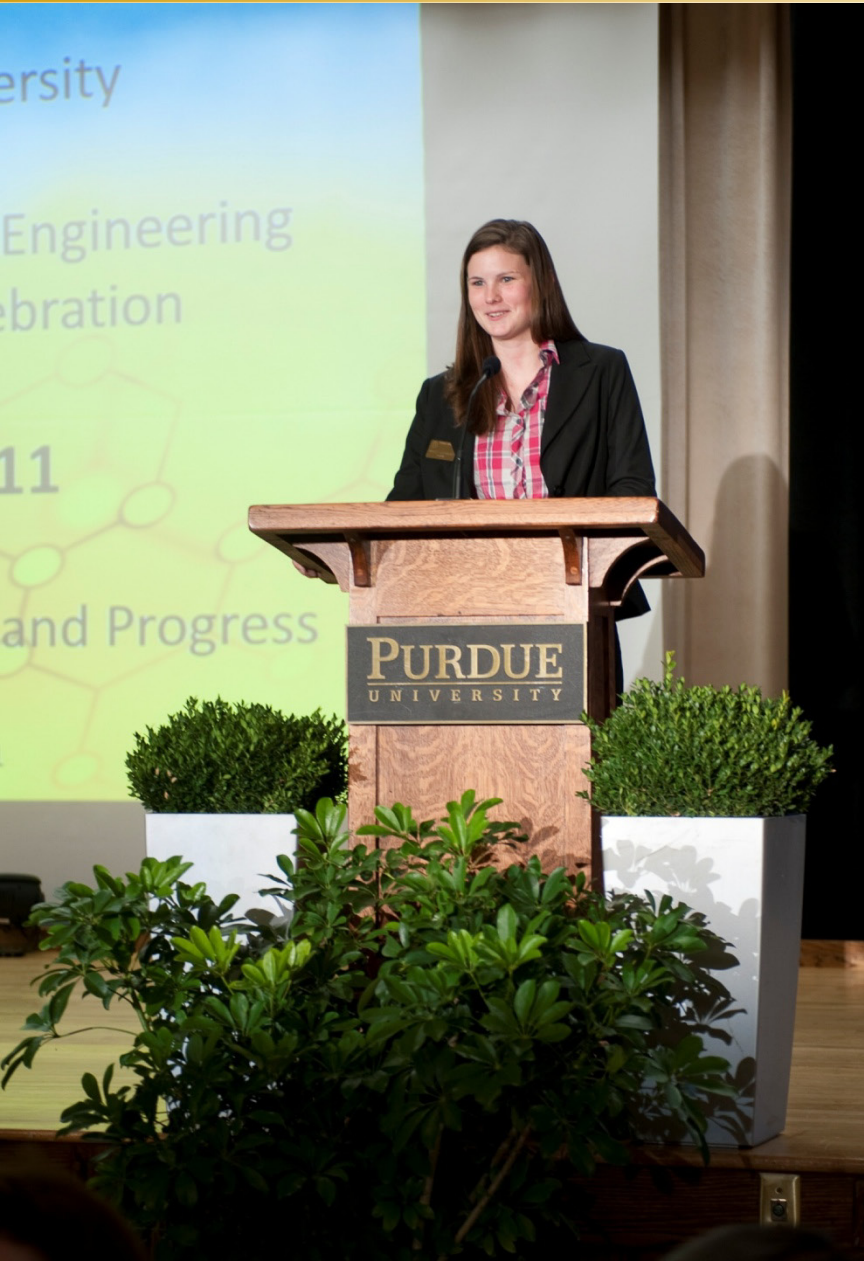




# Miranda McCormack, Junior, Student Trustee

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# Laura Hirshfield, Graduate Student Organization President 2011-12

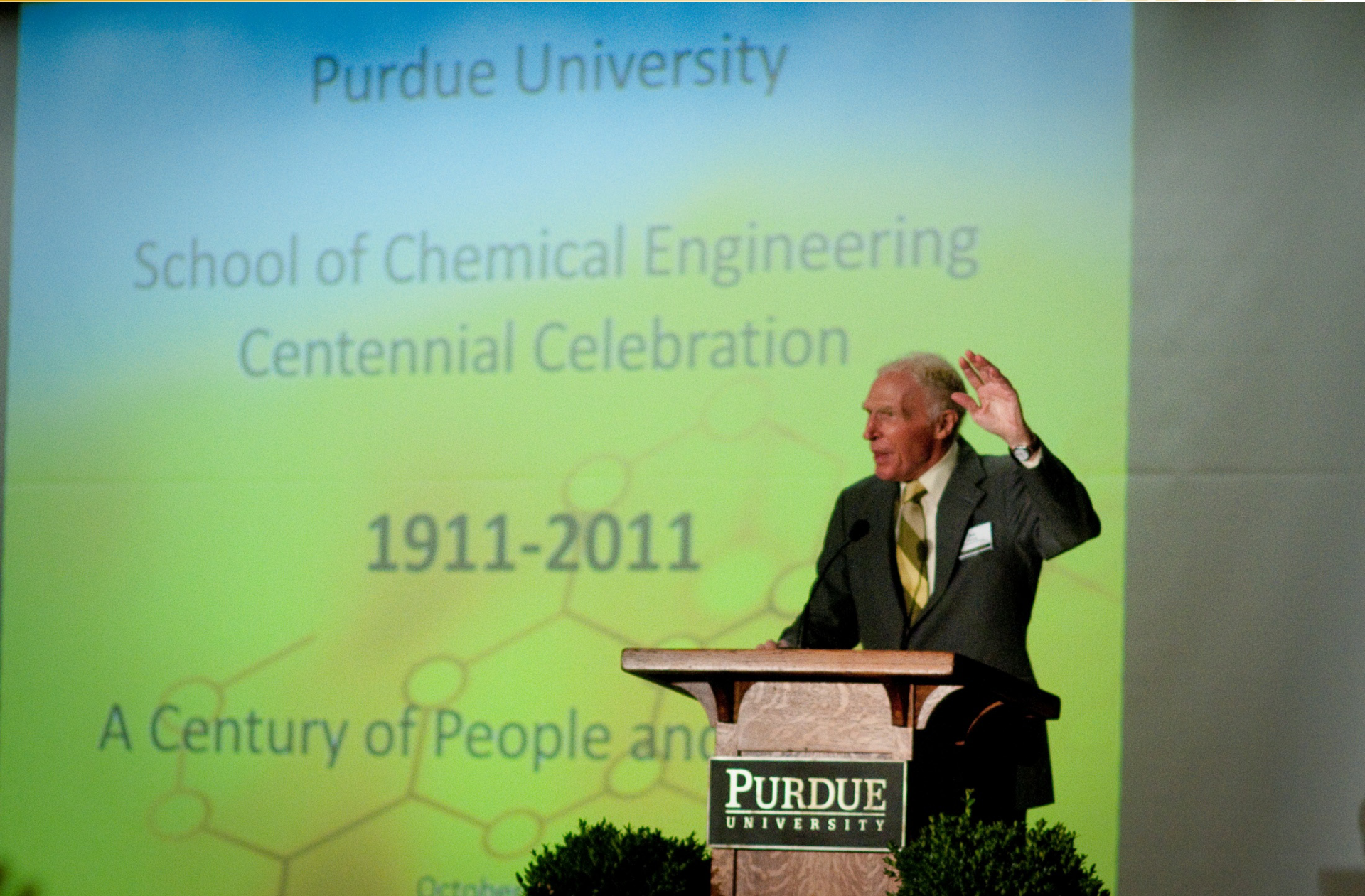




Robert Forney (BSChE 1947, PhD 1950, DEA 1974, HDR 1981) Delivering the Keynote Dinner Talk

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Gerald Skidmore (BSChE 1954, OChE 2011),  
Donald Goodman (BSChE 1938) – Oldest Living Alumnus  
in Attendance, and Gordon Mounts (BSChE 1957, MS 1959)

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**Front Row:**

Miranda McCormack, Junior;  
Professor Linda Wang;  
Susan Hardman (BSChE 1983);  
Julia Alexander (BSChE 1984);  
Roberta Gleiter (BSChE 1960);  
Dean Leah Jamieson

**Second Row:** Marilyn Glenn  
Forney (BSChE 1947),

Lise Sigward (BSChE 1978);  
Michelle Smith (BSChE 1984)

**Third Row:**

Lindsey Williams (BSChE 2010);  
Ronna Robertson (BSChE 1992);  
Lisa Johnson (BSChE 1989);  
Deb Grubbe (BSChE 1977);

**Back Row:**

Gwynne Johnson (BSChE 1977);  
Caitlin Schmitt (BSChE 2011);  
Sandra Marek (BSChE 1979);  
Associate Dean Melba Crawford



# CENTENNIAL STUDENT AWARDS

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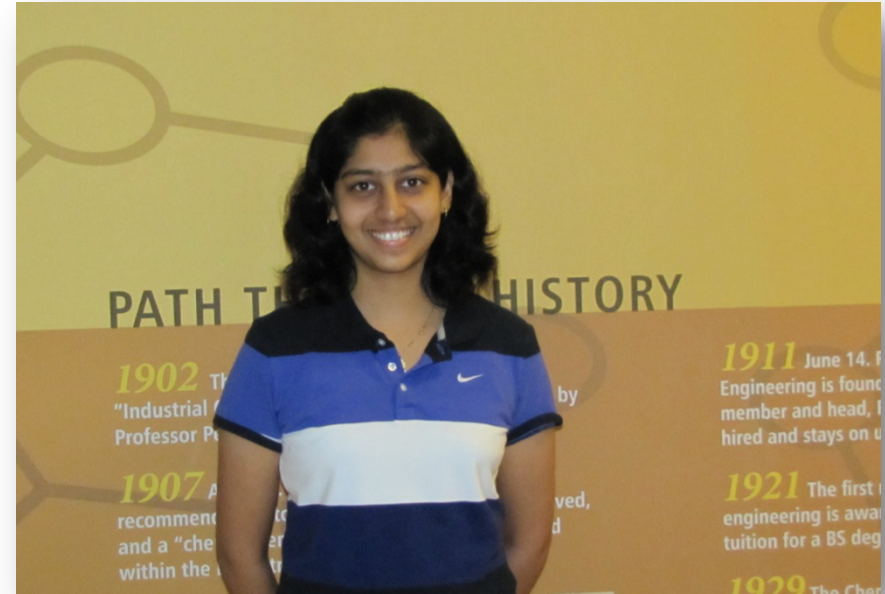
Undergraduate Scholarship  
\$100K Endowment

**Keith Kral**, 2011 recipient  
**Andrew Nguyen** (below left), 2012 recipient



Graduate Fellowship  
\$200K Endowment

**Caleb Miskin** 2011 recipient  
**Shankali Pradhan** (below), 2012 recipient





- **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

## FOCUS AREAS

- **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.



## FOCUS AREAS - 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.



## RESEARCH FRONTIERS

### CLEAN ENERGY

SOLAR  
BIOFUELS  
HYDROGEN  
FUEL CELLS  
COAL  
SUSTAINABILITY

### MEDICAL ENGINEERING

METABOLIC  
ENGINEERING  
  
BIOLOGICAL &  
TISSUE  
ENGINEERING  
  
DRUG DELIVERY  
  
BIOMIMETIC  
MATERIALS

### CHE FUNDAMENTALS

CATALYSIS & REACTION  
ENGINEERING  
  
FLUID MECHANICS &  
INTERFACIAL  
PHENOMENA  
  
MASS TRANSFER &  
SEPARATIONS  
  
MOLECULAR &  
NANOSCALE MODELING  
  
POLYMERS & MATERIALS  
  
PRODUCT &  
PROCESS SYSTEMS  
ENGINEERING

### CHEMICAL SYNTHESIS

ADVANCED MATERIALS  
CATALYST DESIGN  
HYDRODEOXYGENATION  
CHEMICAL SENSORS  
BIOCATALYSIS

### PHARMACEUTICAL ENGINEERING

PARTICLE DESIGN  
& PROCESSING  
  
INFORMATICS &  
COMPLEX SYSTEMS  
  
SENSING TECHNOLOGY  
  
MULTISCALE MODELING  
  
INTERFACIAL SCIENCE

# CHEMICAL ENGINEERING FACULTY

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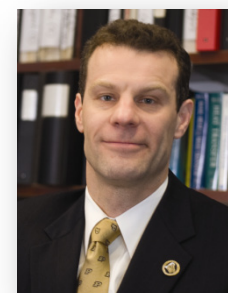
1911-2011



**Rakesh Agrawal**  
ScD, MIT, 1980



**Osman Basaran**  
PhD, Minnesota, 1984



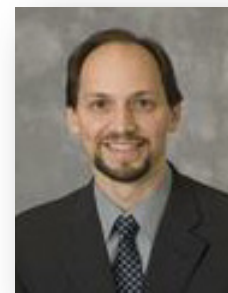
**Stephen P. Beaudoin**  
PhD, NC State, 1995



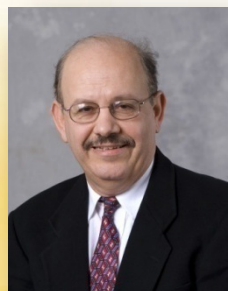
**Bryan W. Boudouris**  
PhD, Minnesota, 2009



**James M. Caruthers**  
ScD, MIT, 1977



**David S. Corti**  
PhD, Princeton, 1997



**Elias I. Franses**  
PhD, Minnesota, 1979



**Robert E. Hannemann**  
MD, Indiana, 1959



**Michael T. Harris**  
PhD, Tenn.- Knoxville, 1992





# CHEMICAL ENGINEERING FACULTY

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**R. Neal Houze**  
PhD, Houston, 1968



**Sangtae Kim**  
PhD, Princeton, 1983



**James D. Litster**  
PhD, Queensland, 1985



**Julie Liu**  
PhD, CalTech, 2006



**John A. Morgan**  
PhD, Rice, 1999



**Zoltan K. Nagy**  
PhD, Babes-Bolyai University, 2001



**Joseph F. Pekny**  
PhD, Carnegie Mellon, 1989



**R. Byron Pipes,**  
PhD, Texas-Arlington, 1972



**Doraiswami Ramkrishna**  
PhD, Minnesota, 1965

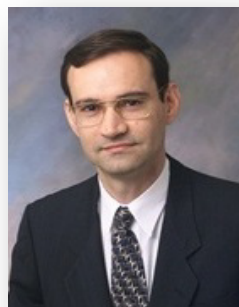
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**Gintaras V. Reklaitis,**  
PhD, Stanford, 1969



**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



**You-Yeon Won**  
PhD, Minnesota, 2000



**Yue Wu**  
PhD, Harvard, 2006



**Chongli Yuan**  
PhD, Cornell, 2007





# CHEMICAL ENGINEERING FACULTY

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**Jeffrey Siirola**

Professor of  
Engineering Practice  
Joined Fall 2011

**Enrico N. Martinez**

Visiting Professor  
Joined Fall 2009



In Memoriam

**Professor Robert Squires**

(1935 – 2011)

# CHE EMERITUS FACULTY

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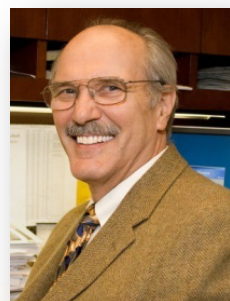
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**Ronald P. Andres**  
PhD, Princeton, 1962



**Kwang-Chu Chao**  
PhD, Wisconsin, 1956



**W. Nicholas Delgass**  
PhD, Stanford, 1969



**Robert A. Greenkorn**  
PhD, Wisconsin, 1957



**George T. Tsao**  
PhD, Michigan, 1960

# CHE RESEARCH FACULTY



**Nancy W. Y. Ho**  
PhD, Purdue, 1968





# NEW FACULTY

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## Jeff Greeley

• Associate  
Professor to Join  
Spring 2013

- B.S., University of Texas-Austin, 1997
- Ph.D., University of Wisconsin-Madison, 2004
- Post-Doctoral Fellow, Technical University of Denmark, 2004 - 2006
- *Research Interests:* Computational studies of nanomaterials for renewable energy applications; surface and interfacial properties of heterogeneous catalysts, electrocatalysts, and energy storage materials



## Rajamani Gounder

• Assistant Professor  
to Join Fall 2013

- B.S., University of Wisconsin, 2006
- Ph.D., University of California, Berkeley, 2011
- Post-Doctoral Fellow, California Institute of Technology, 2011 - 2013
- *Research Interests:* Synthesis of inorganic catalysts with tailored properties; characterization of catalyst active site and support structures; evaluation of catalytic function using fundamental kinetic and mechanistic descriptors.

# CONGRATULATIONS TO CHE FACULTY

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## Rakesh Agrawal

Winthrop E. Stone Distinguished Professor, received the **National Medal of Technology and Innovation** from President Barack Obama. October 21, 2011

- He was one of five recipients in 2011.
- Dr. Agrawal holds 118 U.S. patents, nearly 500 non-U.S. patents and has authored 102 technical papers. He joined Purdue ChE in Fall 2004.
- Also Elected Foreign Fellow of the Indian National Academy of Engineering, 2012



# CONGRATULATIONS TO CHE FACULTY

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## Bryan Boudouris

DARPA Young Faculty Award, 2012 &  
AFOSR Young Investigator  
Research Program Award, 2012



## James Caruthers

Named Reilly Professor of  
Chemical Engineering, 2011



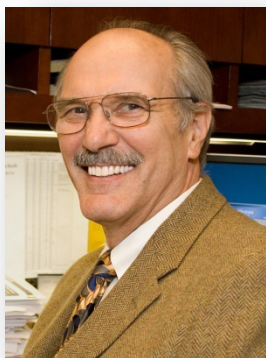
## David Corti

Named Purdue University Faculty Scholar,  
2011 – 2016

# CONGRATULATIONS TO CHE FACULTY

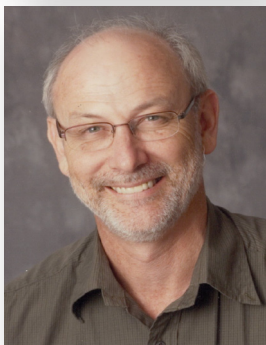
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## Nicholas Delgass

R.H. Wilhelm Award in  
Chemical Reaction Engineering, AIChE, 2012



## Jim Lister

Thomas Baron Award in  
Fluid Particle Systems, AIChE, 2012



## Julie Liu

Awarded the 3M Nontenured Faculty Grant  
Awarded an American Heart Association  
Scientist Development Grant, 2012

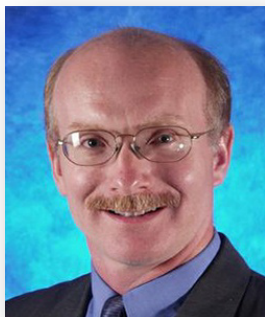




# CONGRATULATIONS TO CHE FACULTY

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## Joseph Pekny

Awarded the Engagement/Service Award by the College of Engineering, Purdue University, 2012



## Fabio Ribeiro

Henry J. Albert Award from the International Precious Metals Institute, 2012



## Doraiswami Ramkrishna

Elected Foreign Fellow of the Indian National Academy of Engineering, 2011



## Rex Reklaitis

- Van Antwerpen Award, AIChE, 2012
- Long Term Achievements Award of the Working Party on Computer Aided Process Engineering of the European Federation of Chemical Engineering, 2012



## Arvind Varma

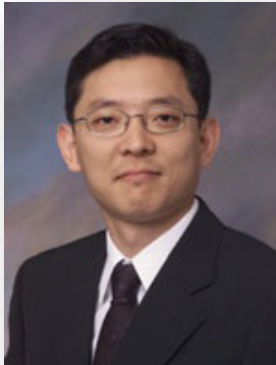
- Named the Jay (BSChE '74) and Cynthia Ihlenfeld Head of Chemical Engineering, 2012
- Elected Fellow of the American Association for the Advancement of Science, 2011



# CONGRATULATIONS TO CHE FACULTY

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**You-Yeon Won**

Inaugural Bindley Bioscience Fellow, Purdue, 2012



**Linda Wang**

Fellow of the American Institute of Chemical Engineers, 2012



**Yue Wu**

DuPont Young Professor Grant, 2010-13

# RECENT ALUMNI HONORS - PURDUE

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## Kristi Anseth, BSChE '92

Tisone Distinguished Professor  
Associate Professor of Surgery  
Howard Hughes Medical Institute Investigator  
University of Colorado at Boulder

**Distinguished Engineering Alumnus**  
(DEA), College of Engineering,  
Purdue, 2012



**Outstanding Chemical Engineer,**  
School of Chemical Engineering  
Purdue, 2012





## 2012 Outstanding Chemical Engineers

October 4, 2012



**William R. Clark, BSChE '82, MSChE '94**  
with Professors Varma and Wang



**Bruce E. Dale, PhD '79**  
with Professors Varma and Morgan

## 2012 Outstanding Chemical Engineers

October 4, 2012



**Marilyn Glenn Forney, BSChE '47**  
with Professors Varma and Reklaitis



**Gregory R. Lewis, BSChE '82**  
with Professors Varma and Houze



## 2012 Outstanding Chemical Engineers

October 4, 2012



**Richard A. Narta, BSChE '80**  
with Professors Varma and Ribeiro



**Steven J. Swanson**  
BSChE '71, MSChE '72, PhD '75  
with Professors Varma and Ramkrishna

## 2012 Outstanding Chemical Engineers

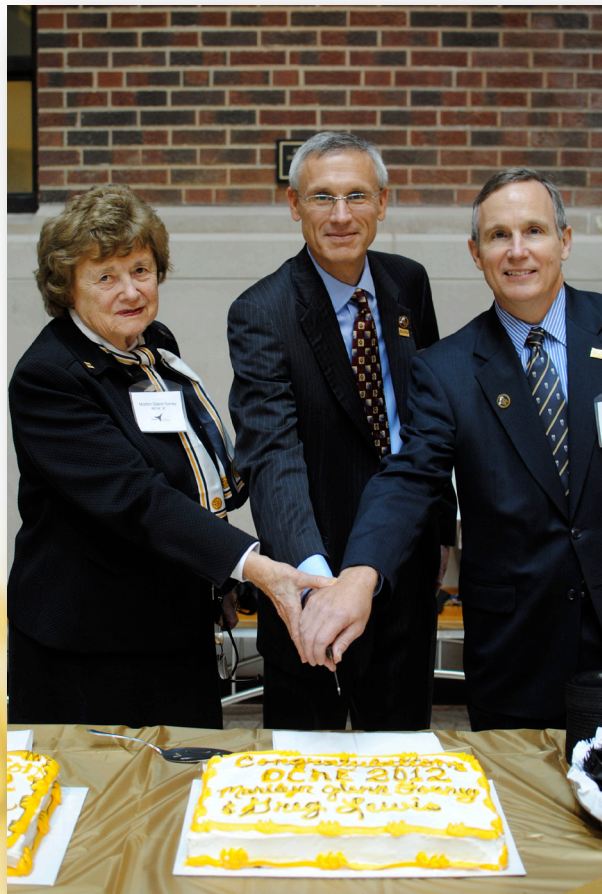
October 4, 2012





# 2012 Outstanding Chemical Engineers

October 4, 2012



# ALUMNI AWARDS



## **Kristi Anseth, BS'92**

Tisone Distinguished Professor  
Associate Professor of Surgery  
Howard Hughes Medical Institute Investigator  
Department of Chemical and Biological Engineering  
University of Colorado

**Inaugural Mid-Career Researcher Award, MRS, 2012**



## **Chris Bowman, BS '88, PhD '91**

Patten Professor of Chemical and Biological Engineering  
Clinical Professor of Restorative Dentistry  
University of Colorado at Boulder

**Professional Progress Award (AIChE), 2011**

**Named Distinguished Professor, Univ. Colorado, 2012**



# ALUMNI AWARDS



## Richard Korsmeyer, MS'80, PhD '83

Global Head of Licensing  
Worldwide Pharmaceutical Sciences  
Senior Research Fellow  
Pfizer

**Elected to the National Academy of Engineering,  
2012**



## Donald R. Miller, PhD '84

Senior Director  
Pfizer

**Industrial R&D Award AIChE, 2012**

# ALUMNI AWARDS



## **Antonios Mikos, MS '85, PhD '88**

Louis Calder Professor of Bioengineering  
Professor of Chemical & Biomolecular Engineering  
Rice University

**Elected to the National Academy of Engineering, 2012**  
**Elected to the Institute of Medicine of the  
National Academies, 2012**



## **Elefterios "Terry" Papoutsakis,** **MS '77, PhD '80**

Eugene DuPont Chair  
Department of Chemical Engineering  
Delaware Biotechnology Institute

**James E. Bailey Award, AIChE, 2012**



# ALUMNI AWARDS

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## David Pershing, BS '70

Named President of the University of Utah, 2012



## David A. Rockstraw, BS '86

Distinguished Achievement Professor  
New Mexico State University

Named Head of the Department of  
Chemical Engineering, 2012

# ALUMNI AWARDS



## Ronna Robertson, BS'92

Director of Engineering and Reliability,  
Packaging Dynamics

**Elected Fellow of the Society of Women Engineers,  
2011**



## Alec Scranton, PhD '90

Foundation Distinguished Professor of  
Chemical and Biochemical Engineering

**Named Dean of the University of Iowa  
College of Engineering, 2012**





# Class of 2012



# UNDERGRADUATE STUDENT HONORS

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## **Candace Corso**

Senior

**Purdue Co-Op Ambassador Student Association President  
2012-13**



## **Miranda McCormack**

Senior

**Elected Purdue Student Trustee  
2011-2013**



## **Tyler Teykl**

BS ChE 2012

**Elected Purdue Student Trustee  
2009-2011**





# GRADUATE STUDENT HONORS

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**Sara Yohe**

Graduate Student  
**NSF Graduate Fellowship,  
2010**



**Janie Brennan**

Graduate Student  
**NSF Graduate Fellowship,  
2011**



**Nicole Devlin**

Graduate Student  
**NSF Graduate Fellowship,  
2011**



**Caleb Miskin**

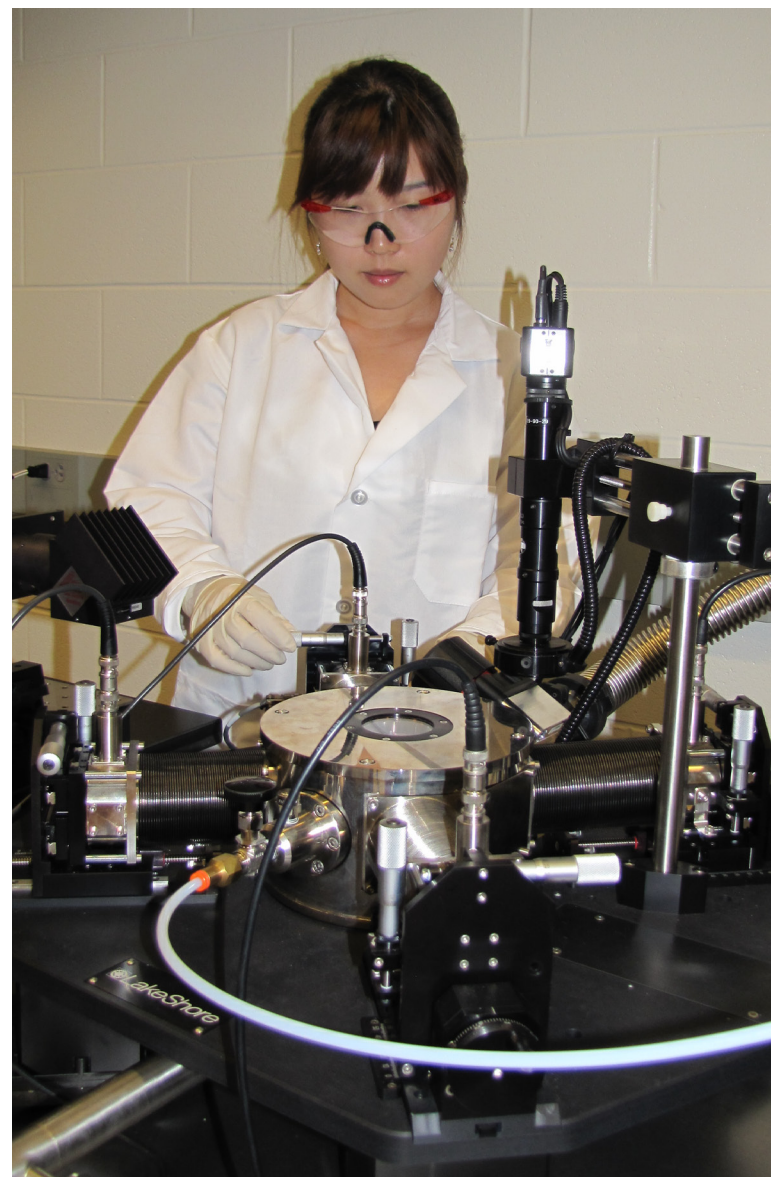
Graduate Student  
**NSF Graduate Fellowship,  
2012**



**Lizbeth Rostro**

Graduate Student  
**NSF Graduate Fellowship,  
2012**

# Graduate Student Activities





# CO-OP STUDENTS, FALL 2011

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# STAFF AWARDS

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**Cristina Farmus**

Administrative Director  
2012 Leadership Award,  
College of Engineering



**Sandy Hendryx**

Secretary  
2012 Excellence Award, School of  
Chemical Engineering  
2012 Mortar Board Rose Award,  
Purdue University





# JANUARY 2012

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# KELLY LECTURE - APRIL 10 - 11, 2012



## **JAMES A. DUMESIC**

Steenbock Chair, College of Engineering  
Michel Boudart Professor of Chemical and Biological Engineering  
University of Wisconsin-Madison

» **STRATEGIES FOR CATALYTIC CONVERSION OF BIOMASS TO HYDROGEN & LIQUID HYDROCARBON FUELS**

Tuesday, April 10, 9:00–10:15 a.m. • Room G140, Forney Hall

» **CATALYTIC CONVERSION OF HEMI-CELLULOSE & CELLULOSE TO FUELS & CHEMICALS**

Wednesday, April 11, 11:30 a.m.–12:30 p.m. • Room 3059, Forney Hall

2012  
**KELLY  
LECTURES**



## **JAMES A. DUMESIC**

Steenbock Chair, College of Engineering  
Michel Boudart Professor of Chemical and Biological Engineering  
University of Wisconsin-Madison

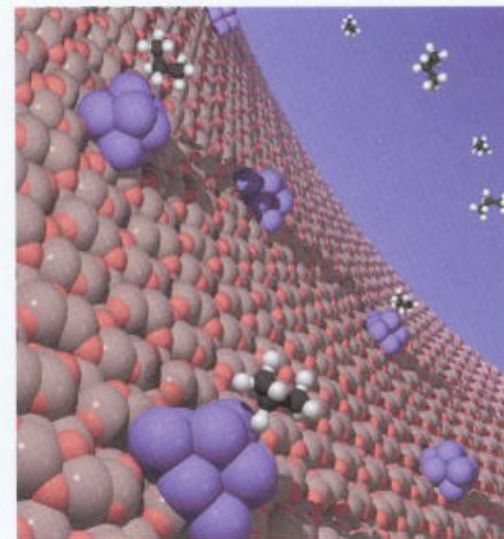
[http://www.engr.wisc.edu/che/faculty/dumesic\\_james.html](http://www.engr.wisc.edu/che/faculty/dumesic_james.html)



## STRATEGIES FOR CATALYTIC CONVERSION OF BIOMASS TO HYDROGEN & LIQUID HYDROCARBON FUELS

Tuesday, April 10, 9:00-10:15 a.m. • Room G140, Forney Hall

Our society is searching for renewable sources of energy and chemicals because of environmental and political issues created by dependence on fossil fuels, global warming, national security and diminishing petroleum resources. Dumesic will introduce strategies for catalytic conversion of biomass-derived carbohydrates to produce  $H_2$  and  $CO_2$  for fuel cell applications, to generate  $H_2$  and  $CO$  for synthesis gas applications, or to produce liquid alkanes for transportation fuels. He will also present a cascade catalytic process for conversion of cellulose to gasoline or jet fuel, passing through the intermediate formation of levulinic acid and  $\gamma$ -valerolactone.



## CATALYTIC CONVERSION OF HEMI-CELLULOSE AND CELLULOSE TO FUELS & CHEMICALS

Wednesday, April 11, 11:30 a.m.-12:30 p.m. • Room 3059, Forney Hall

The conversion of lignocellulosic biomass to fuels and chemicals requires the effective utilization of the  $C_5$  and  $C_6$  sugars present in hemi-cellulose and cellulose, respectively. Dumesic will address how the hemi-cellulose fraction of lignocellulosic biomass can be converted to furfural and levulinic acid using biphasic reactors with alkylphenol solvents, and explain the conversion of levulinic acid to gamma-valerolactone (GVL) in these solvents. In addition, he will show how various biomass-derived solvents can be used to extract levulinic acid produced by deconstruction of the cellulose in aqueous solutions of mineral acids. Finally, Dumesic will examine the decarboxylation of GVL to produce butene over solid acid catalysts, combined with the oligomerization of butene to produce liquid transportation fuels.



# 4<sup>TH</sup> WOMEN IN CHEMICAL ENGINEERING SEMINAR

SATURDAY, APRIL 14, 2012

Undergraduate and graduate women Chemical Engineering students and Chemical Engineering alumnae met for a day of networking on career choices, opportunities and challenges for women chemical engineers.

Our remarkable Chemical Engineering alumnae shared their career and personal experiences and perspectives during this energizing and fun event.



## 2012 Women in Chemical Engineering Seminar

April 14, 2012

*"Career Perspectives"*

*Purdue Alumnae Panels:*

- *Oil and Gas and Chemicals*
- *Pharmaceuticals, Consumer Products and Food*
- *Entrepreneurs and Alternative Careers*



*This event is  
sponsored by Shell.*





# Women in ChE Seminar

## Entrepreneurs and Non-Traditional Careers



**Linda Huff**, President, Huff & Huff Inc.

**Dr. Kim Henthorn**, Associate Professor, Department of Chemical Engineering, Rose-Hulman Institute of Technology

**Jamie Drewry**, Patent Attorney/Associate, Faegre Baker Daniels LLP

**Dr. Linda Wang**, Professor of Chemical Engineering, School of Chemical Engineering, Purdue University

**Roberta Gleiter**, Chief Executive Office, Global Institute for Technology & Engineering (GIFTE)

# Women in ChE Seminar

## Oil and Gas and Chemicals Panel



**Celeste McLeod**, Senior Technologist – Renewables, CRI

**Dr. Dana Gary**, ExxonMobil Research and Engineering

**Kim Grimes**, SABIC Innovative Plastics

**Michelle Smith**, Consultant

**Linda Davis**, Industrial Education Director, School of Chemical Engineering, Purdue University



# Women in ChE Seminar

## Pharmaceuticals, Consumer Products and Food



**Amanda Gantz**, Kimberly-Clark Corporation (not pictured)

**Diane Tennenhouse**, Eli Lilly and Company

**Ronna Robertson**, Director of Engineering Reliability, Packaging Dynamics

**Wendy Meyer**, Project Engineering Services Group Leader, Vertellus Specialties Inc.

**Dr. Chongli Yuan**, Assistant Professor, School of Chemical Engineering, Purdue University

# EV GRAND PRIX

## APRIL 14, 2012





# CHEMICAL ENGINEERING

## SUSTAINABILITY INITIATIVE (CSI)

April 26, 2012



At the invitation of CSI, staff and students visited the Landfill in Clinton County, IN.





# CHE FACULTY, STAFF AND STUDENT APPRECIATION RECEPTION

May 3, 2012



Business Office Staff with  
Professors Harris and Litster

Sandy Hendryx  
receiving the  
ChE Staff Excellence Award  
from Dr. Varma





# CHE FACULTY, STAFF AND STUDENT APPRECIATION RECEPTION

Centennial Celebration  
A Century of People and Progress

1911-2011

May 3, 2012

Professor Martinez  
with Professor Delgass



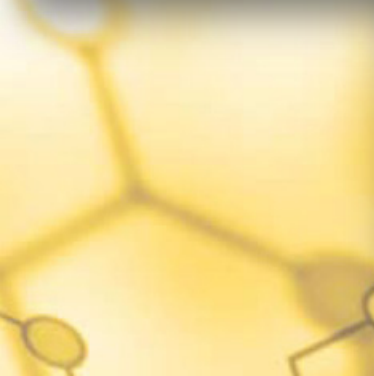
ChE School Staff





# PROFESSOR DELGASS

## RETIREMENT RECEPTION

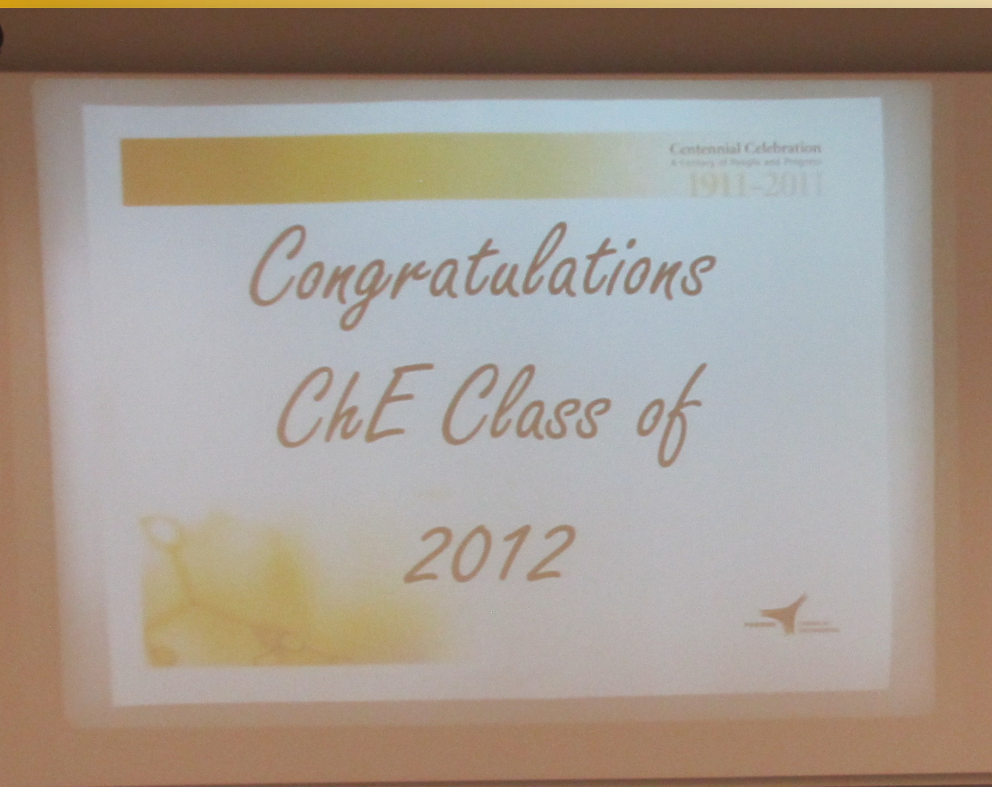




# 2012 GRADUATION RECEPTION

Centennial Celebration  
A Century of People and Progress

1911-2011



May 11, 2012



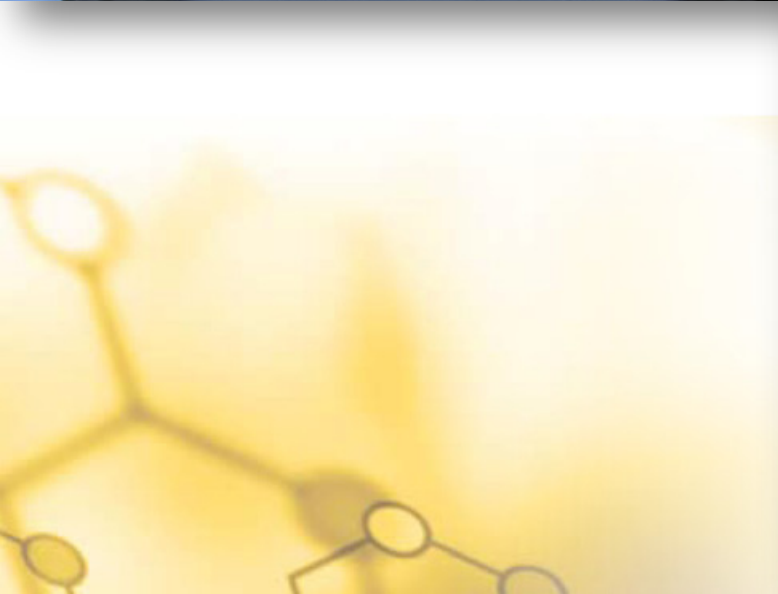
# 2012 GRADUATION RECEPTION

Centennial Celebration  
A Century of People and Progress

1911-2011



163 BS Degrees Granted  
during  
Academic Year 2011-12





# 2012 CHE STAFF RETREAT

JULY 12, 2012





# GRADUATE STUDENT ORGANIZATION (GSO)



**Nathan Carter**  
President



**Si Chen**  
Vice President/Treasurer



**Laura Hirshfield**  
Co-Curricular  
Activities Chair



**Renay Su**  
Social Committee  
Chair



**Frank DeVilbiss**  
Outreach Committee  
Chairperson



# GRADUATE STUDENT ORGANIZATION

## (GSO)

Centennial Celebration  
A Century of People and Progress

1911-2011



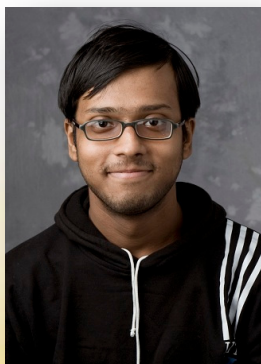
**Janie Brennan**  
Voting Representative



**Nicole Devlin**  
First Year  
Representative



**Anshu Gupta**  
Inter-GSO Chair



**Atish Parekh**  
Social Committee Chair



**Caitlin Schram**  
Non Voting  
Representative



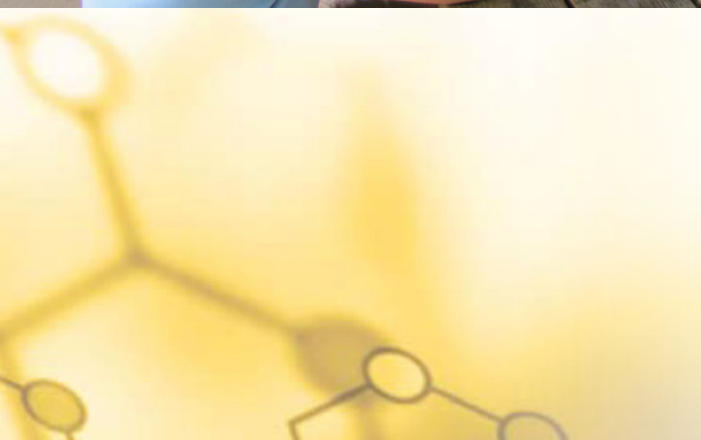
**Aniruddha Kelkar**  
PGSG Senator



# GSO – NEW GRADUATE STUDENTS

## WELCOME PICNIC

August 13, 2012



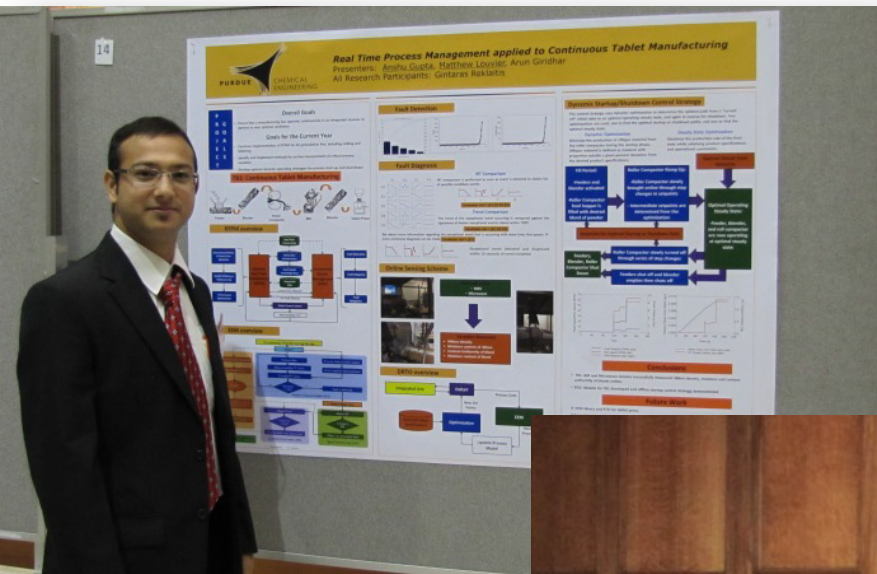


# 21<sup>ST</sup> ANNUAL GRADUATE RESEARCH SYMPOSIUM

Centennial Celebration  
A Century of People and Progress

1911-2011

August 15-16, 2012



Graduate Student  
Anshu Gupta  
presenting a poster

2012 Graduate Student Organization Officers



# GSO SYMPOSIUM – POSTER SESSION

Centennial Celebration  
A Century of People and Progress  
1911-2011

April 15 – 16, 2012



Graduate Students John O'Grady and Eric Sheets

Professor Martinez with Graduate Student Mark Suchomel



## Advanced Monitoring & Control of Lithium Ion Batteries

**PURDUE CHEMICAL ENGINEERING**  
Advisors: Professor James Caruthers<sup>1</sup>, Professor Steven Dunlop<sup>1</sup>  
Student Authors: Mark Suchomel<sup>1</sup>, Paul John Martin<sup>1</sup>  
Collaborators: Professor Farshid Sadeghi<sup>2</sup>, Naveed Anand David<sup>1</sup>

Vehicle electrification is strongly dependent on consumer behavior and advancing battery technologies. Batteries and under-utilized storage capacities inhibit competitive electric vehicle (EV) prices. Lithium ion batteries have provided the most significant improvement in state-of-charge measurement capabilities and state-of-health.

**Problem Statement**  
Today's EVs require thousands of lines of control code, the vast majority of which monitors the battery. Complex algorithms and look-up tables estimate the state-of-charge (SOC) from low fidelity current, voltage and temperature data. True SOC and SOH must be measured directly, at the microscopic level.

**Motivation**  
• Current SOC determination techniques rely on coulomb counting, but online integration of current is difficult.  
• Non-Stop Monitoring  
• Small Signal - 100mA  
• Relay AC Meters/Controllers  
• Error Accumulation  
• Large Current Range (x1-400A)

$$SOC = SOC_0 - \int_{t_0}^t \frac{I(t)}{C} dt$$

**Battery Management System Algorithm**  
• Excessive  
• Provide  
• Excess  
• For  
• Per  
• of c

**Current Method**  
• Excessive  
• Provide  
• Excess  
• For  
• Per  
• of c

**Proposed Method (Patent Pending)**  
• Excessive  
• Provide  
• Excess  
• For  
• Per  
• of c

**Funding**



# GSO Symposium – Banquet

Centennial Celebration  
A Century of People and Progress

1911-2011

August 18, 2012



Hari Nair (PhD 2009),  
Professor Fabio Ribeiro,  
Ajay Joshi (PhD 2007),  
Professor Nicholas Delgass, and  
Saurabh Chaugule (PHD 2010)

Graduate students Renay Su,  
Richard Galas, and Janie Brennan  
with Professor Julie Liu



# STUDENT AWARDS

## 2012-13 Graduate Student Organization Symposium

### Oral Presentations

- First Place: **Anand Venkatesan**  
Advisor Phillip Wankat  
*“Low Cost Synergistic Desalination Processes”*
- Second place: **Sara Yohe**  
Advisors Nicholas Delgass and  
Fabio Ribeiro  
*“High Pressure Catalytic Hydrodeoxygenation  
Reaction Pathways and Kinetics for  
Dihydroeugenol over Pt/ZrO<sub>2</sub> and Ru/ZrO<sub>2</sub>  
catalysts”*
- Third Place: **Krishnaraj Sambath**  
Advisor Osman Basaran,  
*“Fission and Fusion of Liquid Drops”*
- Honorable Mention: **Jayachandran Devaraj**  
Advisor Doraiswami Ramkrishna,  
*“Model-based Individualized Treatment for  
Childhood Leukemia”*



Professor Varma with  
Anand Venkatesan



# STUDENT AWARDS

## 2012-13 Graduate Student Organization Symposium

### Poster Presentations

- First Place: **Gautam Yadav**  
Advisor Yue Wu  
*“Design and Assembly of Nanostructured Materials for the Construction of Batteries and Thermoelectric Devices”*
- Second place: **Aniruddha Kelkar**  
Advisors David Corti and Elias Franses,  
*“Multi-Scale Approach to Dispersion Dynamics: Plug Formation in Sub-Sea Oil Pipelines”*
- Third Place: **Kaiwalya Sabnis**  
Advisors Nicholas Delgass and Fabio Ribeiro  
*“Water-Gas Shift Catalysis over Transition Metals Supported on Molybdenum Carbide”*



Professor Varma with Gautam Yadav

# GSO – NEW GRADUATE STUDENTS

## MIXER

August 18, 2012



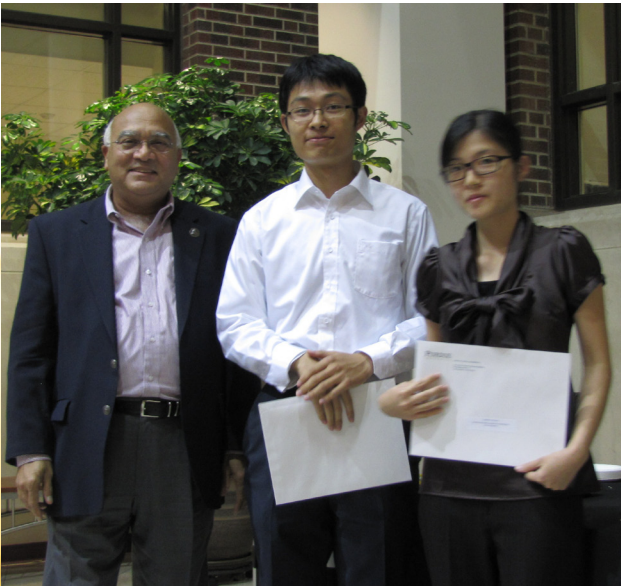
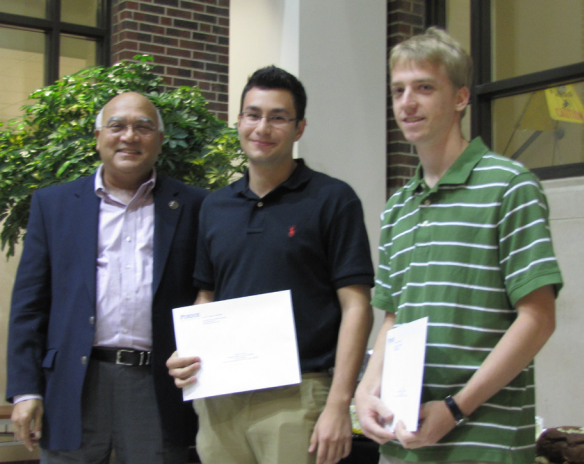


# SCHOLARSHIP BANQUET

September 20, 2012

Centennial Celebration  
A Century of People and Progress

1911-2011



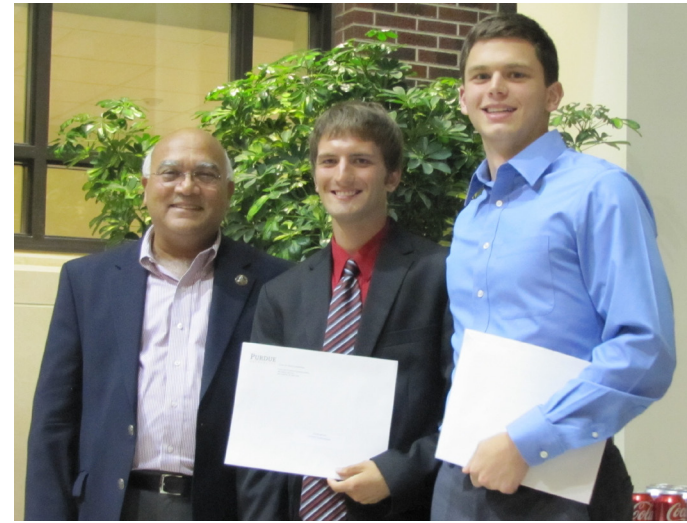


# SCHOLARSHIP BANQUET

September 20, 2012

Centennial Celebration  
A Century of People and Progress

1911-2011

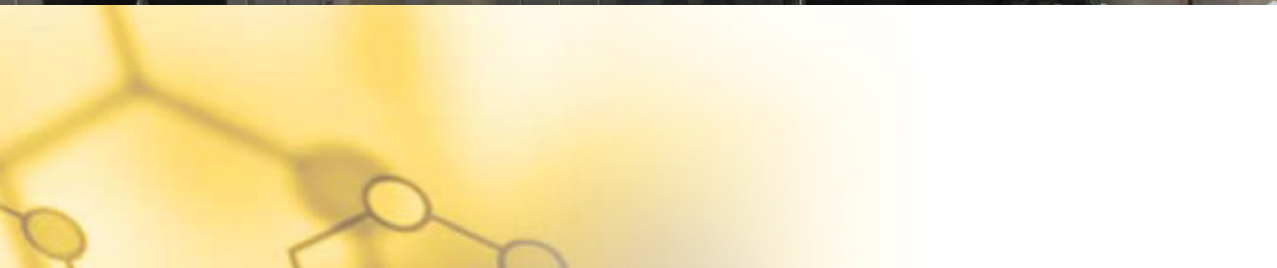




# CLASS OF 1952 – 50 YEAR REUNION

# CLASS OF 1962 – 40 YEAR REUNION

September 28, 2012



# CLASS OF 1952 – 50 YEAR REUNION

# CLASS OF 1962 – 40 YEAR REUNION

September 28, 2012



Class of 1952: Jon Brooks, Joe Corns,  
and Bob Bailey



Class of 1962:  
Dave Rea and Ben Lipps



**FALL 2012**

Centennial Celebration  
A Century of People and Progress

1911-2011





# Purdue ChE

## Undergraduate Students



ChE- Student Advisory Council  
Annual Fundraiser



ChE- Ambassadors, Seniors  
Andrew Nguyen and Jeff Bush



# PROFESSOR AGRAWAL AND HIS RESEARCH GROUP

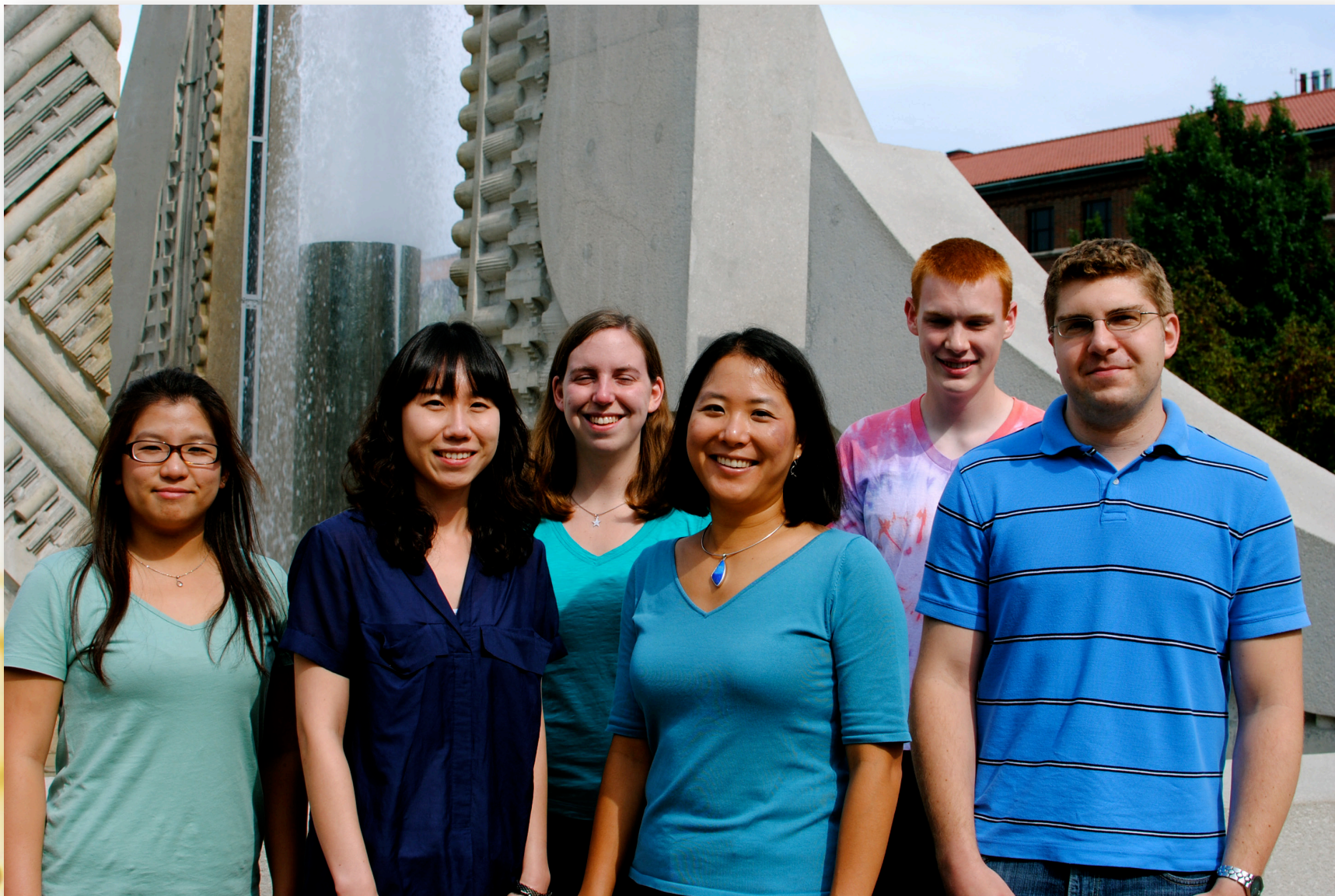
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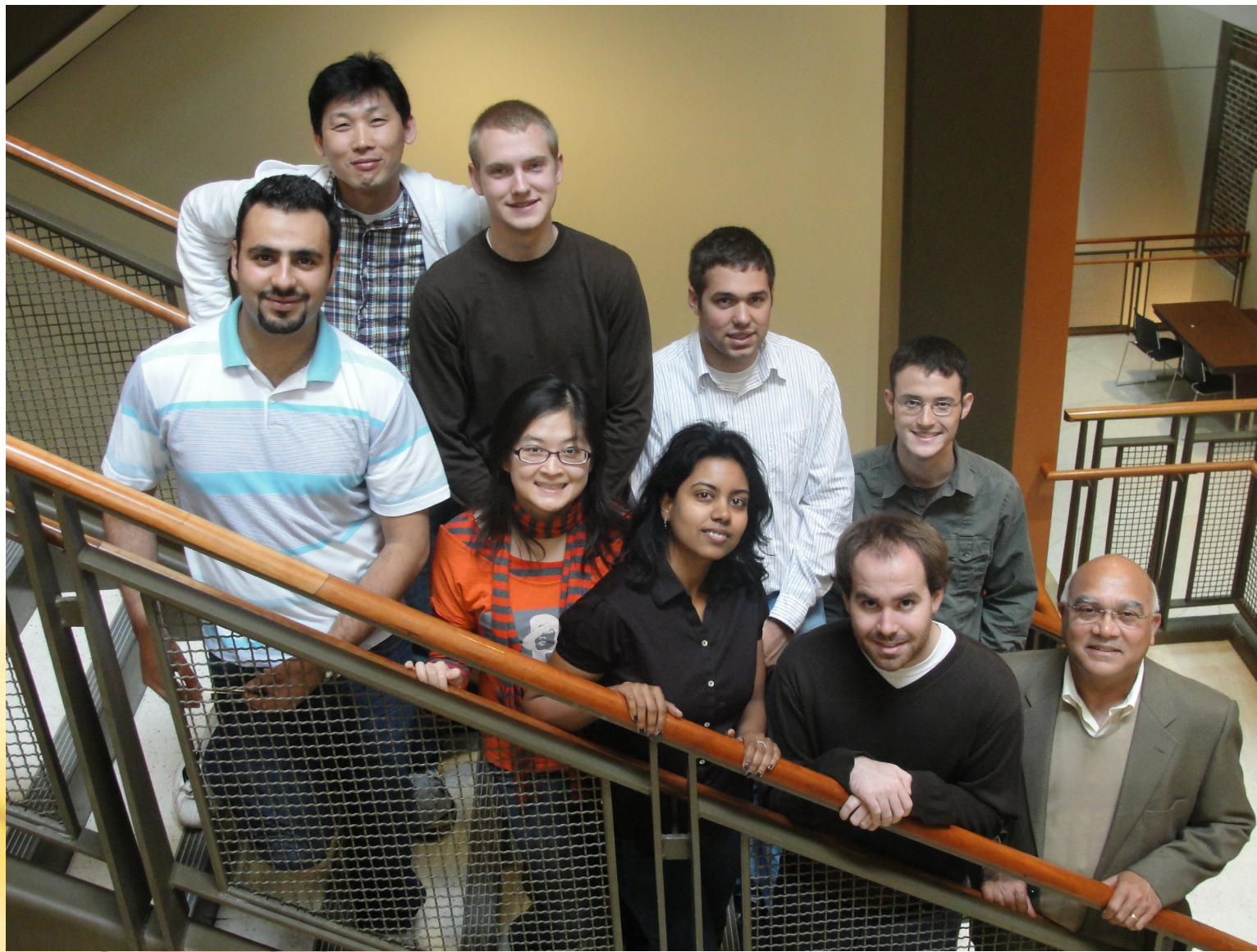


# PROFESSOR LIU AND HER RESEARCH GROUP



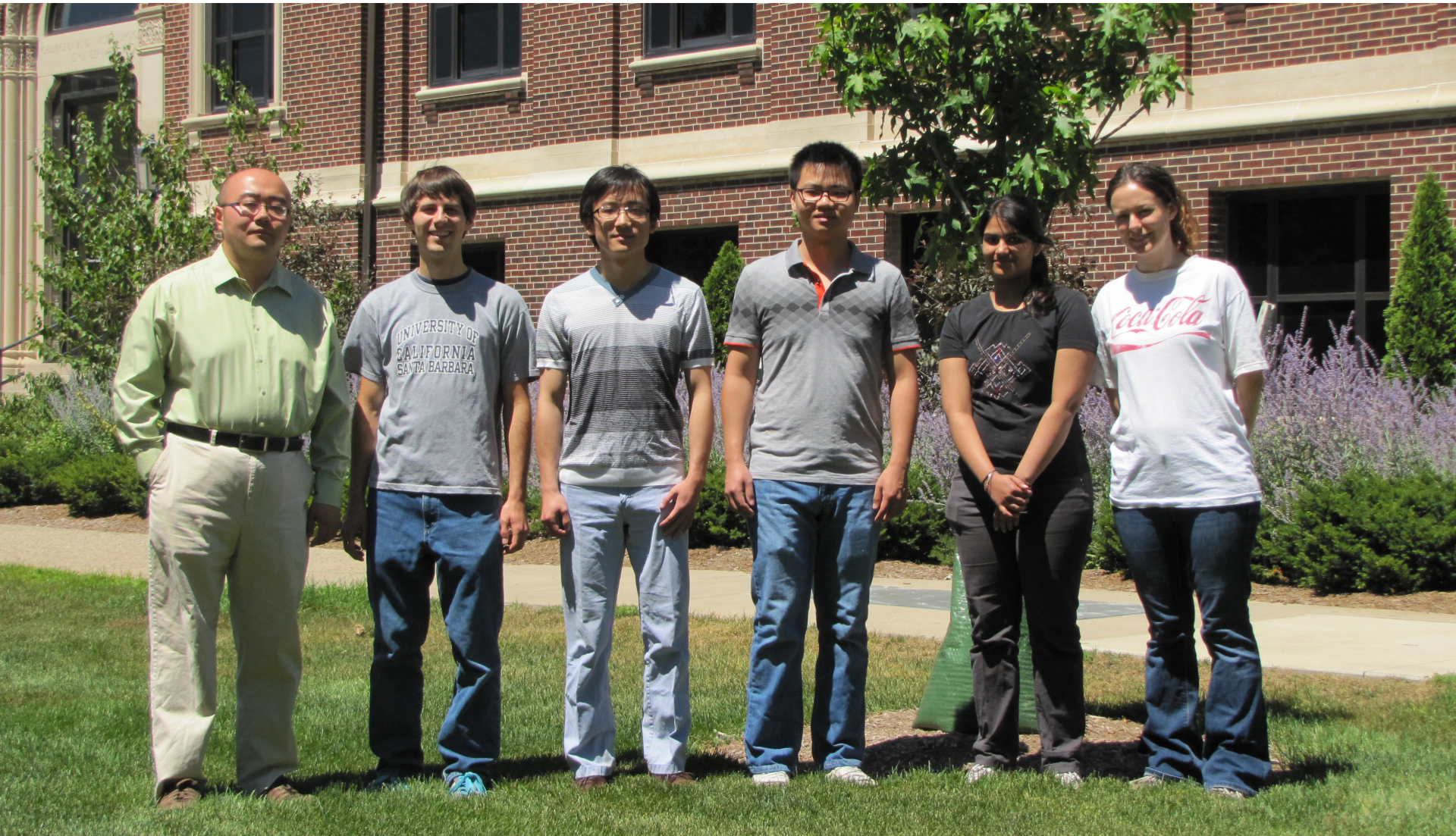


# PROFESSOR VARMA AND HIS RESEARCH GROUP





# PROFESSOR WU AND HIS RESEARCH GROUP





**PROFESSOR  
YUAN  
AND HER  
RESEARCH  
GROUP**



# ChE Academic Advisory Board

Centennial Celebration  
A Century of People and Progress

1911-2011

## **Kristi Anseth**

Tissone Professor and HHMI Investigator,  
Chemical and Biological Engineering  
University of Colorado

## **Ignacio Grossman**

Rudolph R. and Florence Dean  
University Professor  
Chemical Engineering,  
Carnegie-Mellon

## **Alexis Bell**

The Dow Professor of Sustainable Chemistry  
UC Berkeley

## **Michael Ramage**

Executive Vice President,  
ExxonMobil, Retired

## **Frank Bates**

Regents Professor and Department Head  
Chemical Engineering and Materials Science  
University of Minnesota

## **Gregory Stephanopoulos**

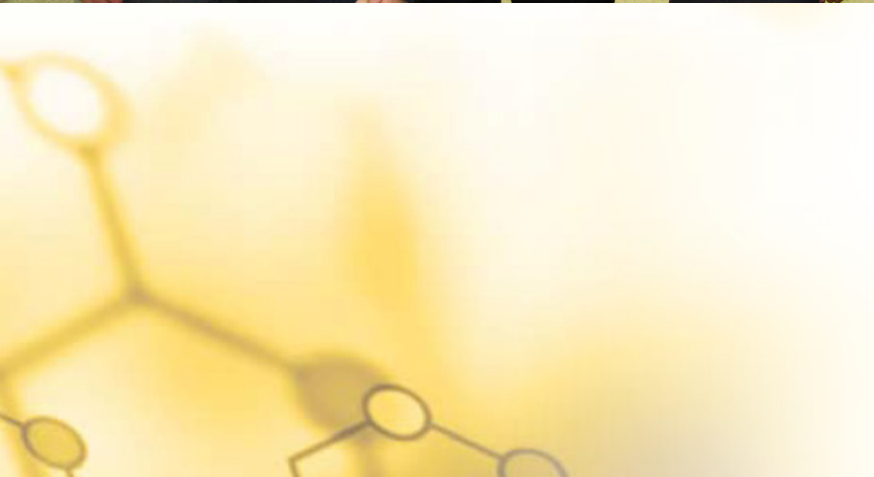
W. H. Dow Professor of Chemical Engineering  
MIT





# Industrial Advisory Council Meeting

October 5, 2012





# Industrial Advisory Council

Centennial Celebration  
A Century of People and Progress

1911-2011

## Visit to the Unit Operations Laboratory, Forney Hall





# Unit Ops Lab Renovation

## Objectives

- Remove older experiments and introduce new more relevant ones
- Implement safety upgrades
- Equip most experiments with Labview for automation and data management
- Paint walls and floor
- Upgrade furniture
- Set up small “museum” with “antique” experiments



**The full renovation process is expected to be carried out during 2 summer periods.**

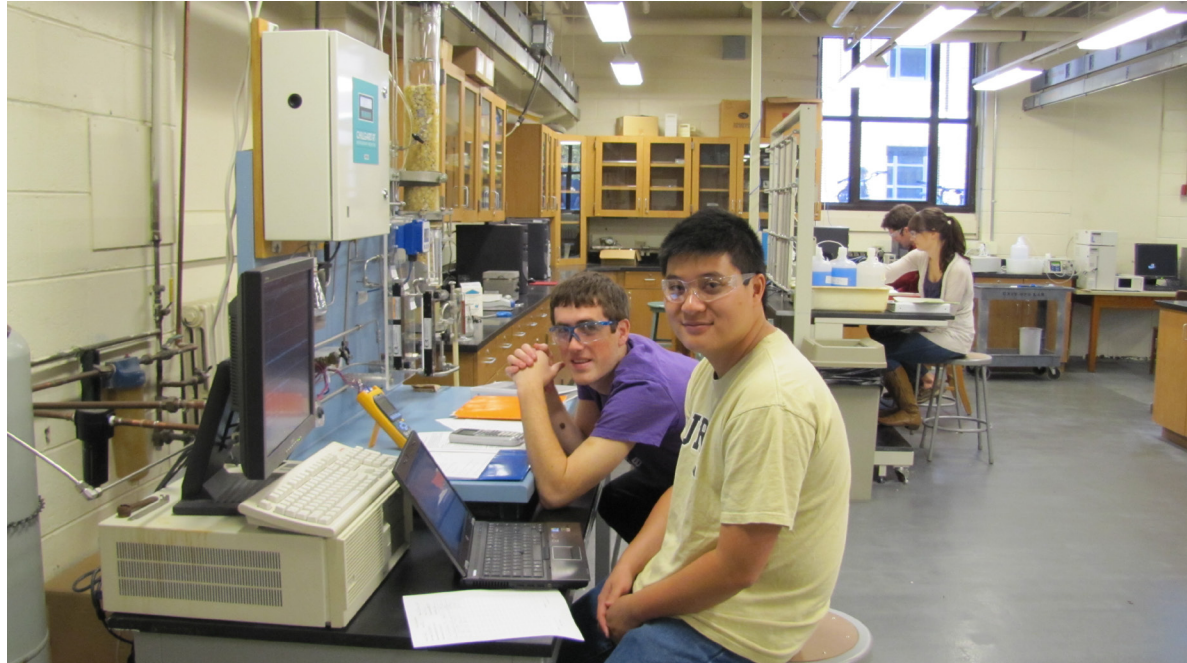
# Unit Operations Lab Upgrade

Need: \$500K

Raised to Date: \$275K

## Sponsors to date:

- Alumni
- Faculty members
- Purdue University Repair and Renovation Funds
- Corporations





# CHEMICAL ENGINEERING NEWSLETTER

Spring 2012  
A Century of People  
and Progress



SPRING 2012  
**CHEMICAL ENGINEERING**  
NEWSLETTER



CENTENNIAL CELEBRATION 1911-2011 A CENTURY OF PEOPLE AND PROGRESS

# Thank you!

Centennial Celebration  
A Century of People and Progress

1911-2011



Cristina Farmus, Administrative Director  
[cfarmus@purdue.edu](mailto:cfarmus@purdue.edu)  
765-494-0027

