

Research, Education and Other Collaborative Resources Available at Purdue University

Cristina Farmus

Managing Director, Chemical Engineering, Purdue University



Purdue – Mexico Center for Sustainability 2nd Workshop
Cuernavaca, May 21, 2014

Overview

- Purdue history and administration
- Student enrollment and degrees
- International profile, Mexico spotlight
- College of Engineering
- Chemical Engineering
- Discovery Park
- Purdue Research Park
- Online education
- Purdue - Mexico Center for Sustainability
- Conclusions

Mitch Daniels Joined as Purdue's 12th President!



2013
Purdue
University
President

2004-2012
Governor of the
State of Indiana

BA, Princeton, 1971

JD, Georgetown, 1979

Purdue University Facts

**Founded in
1869**

**Co-educational,
state assisted**

**Strengths in
Engineering and Agriculture**

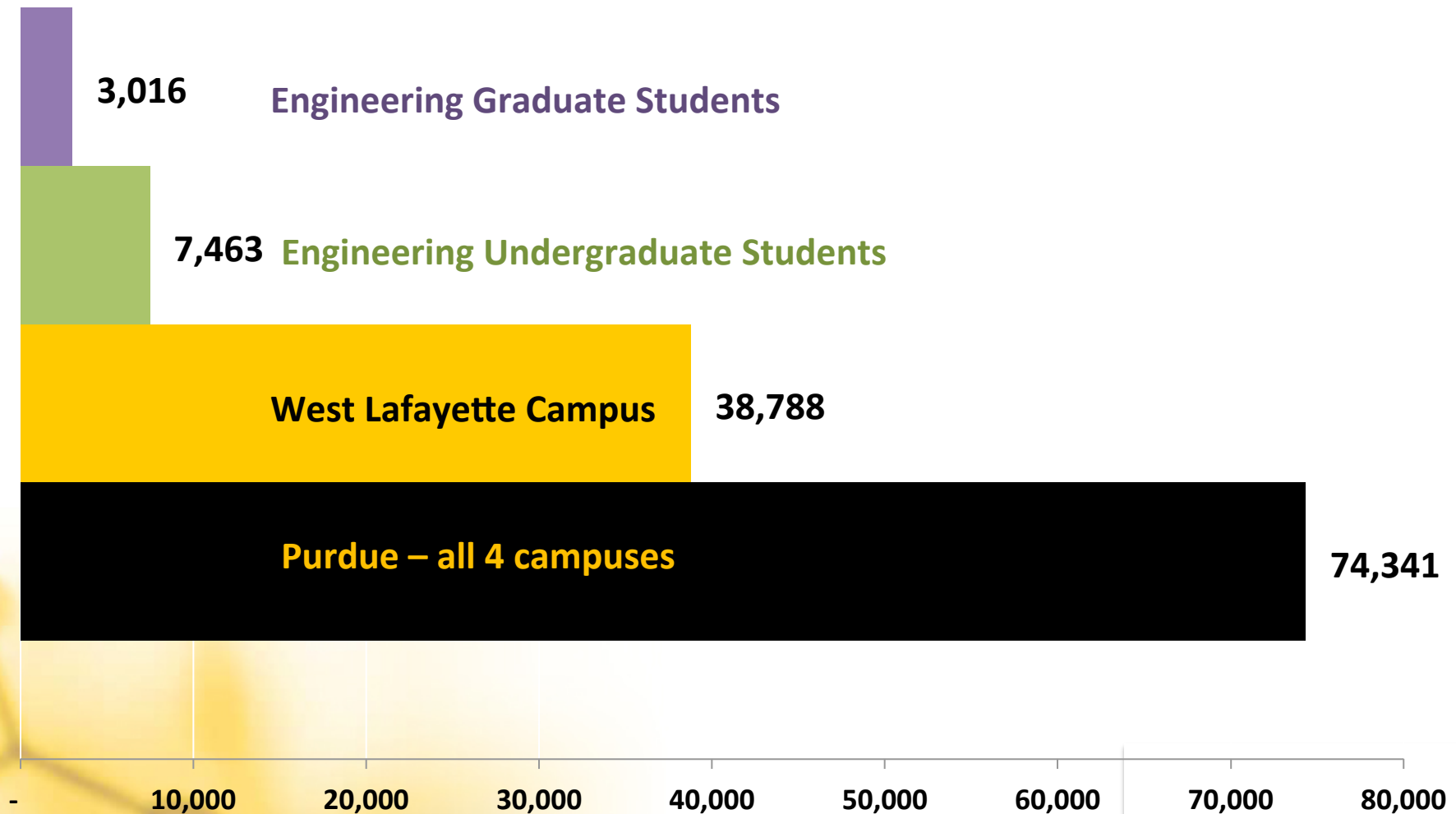
4 Campuses

**West Lafayette
campus offers
5,800 courses
in 400
undergraduate
majors**

**MS and PhD
Degrees offered
under Grad School**



Student Enrollment - Fall 2013

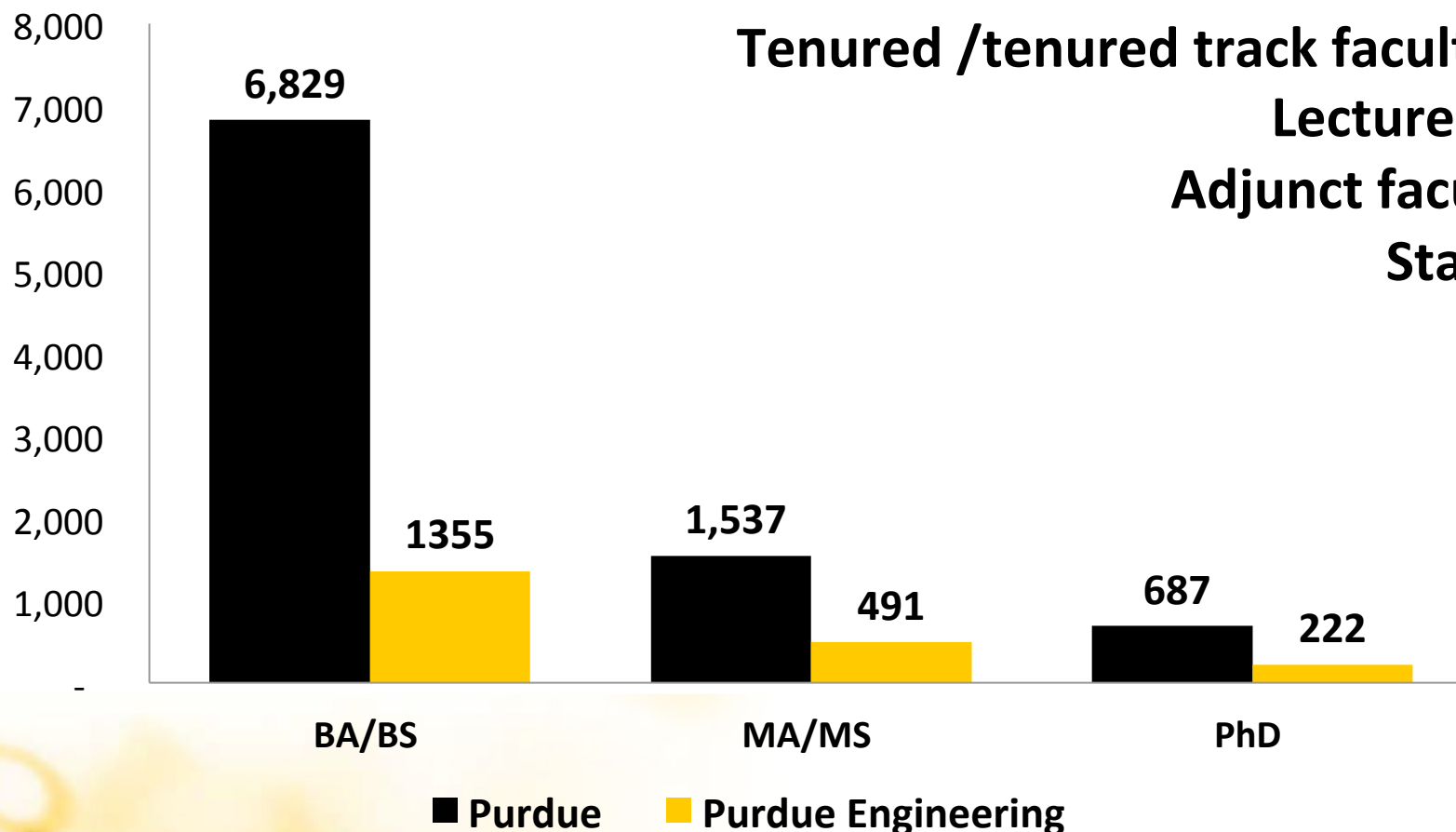


Degrees Awarded

2012-2013

Faculty and Staff

Fall 2013



Tenured /tenured track faculty **2,478**

Lecturers **1,244**

Adjunct faculty **577**

Staff **9,278**

Research Expenditures, 2012-13

Purdue – \$614 million; Engineering – \$160 million

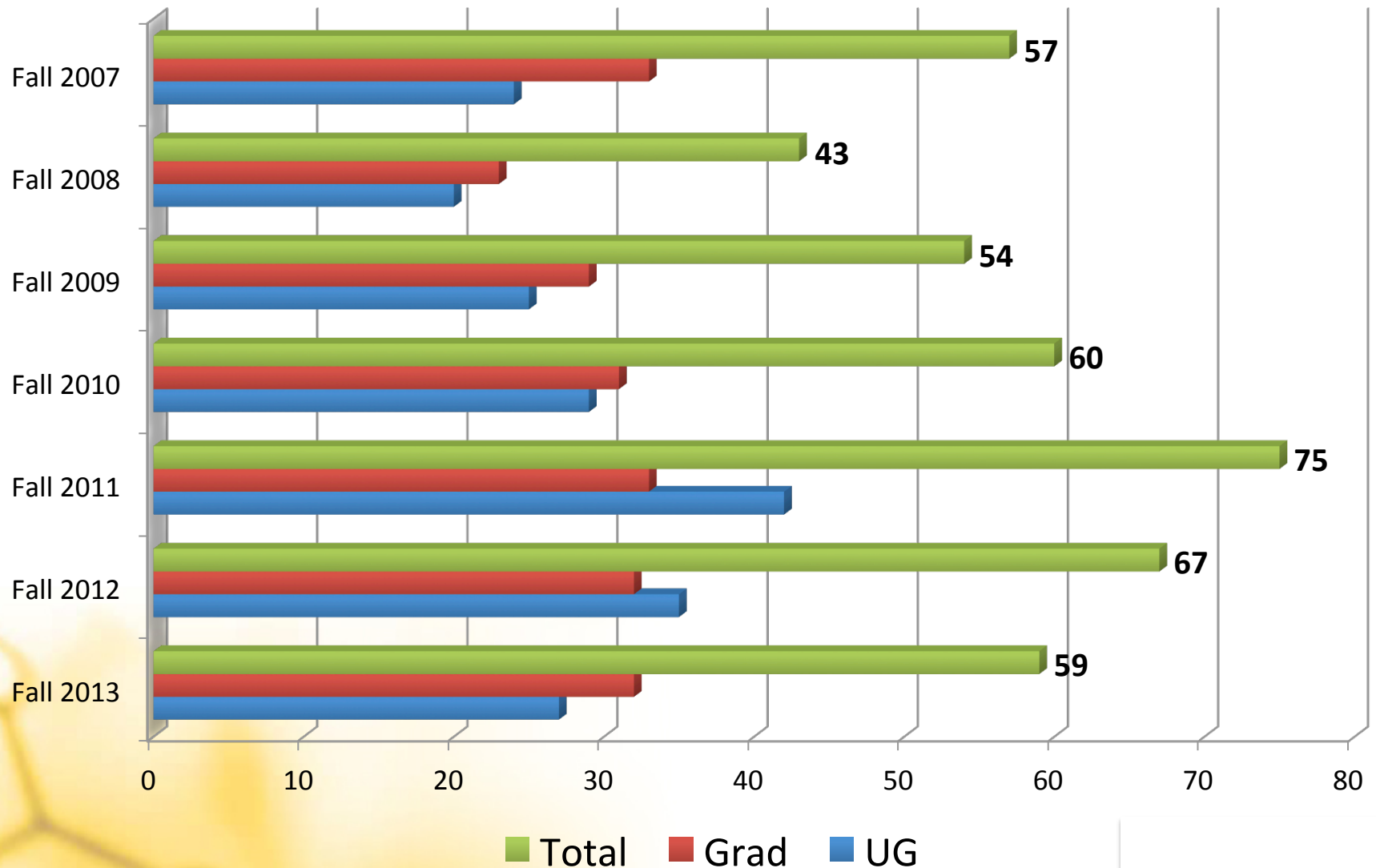
Purdue International Programs

Fall 2013 Statistics

- **Purdue ranks 2nd** in United States in international student enrollment
- **8,702 international students** from **125 countries**
- **17% of undergraduate** and **40% of graduate** students are international
- Top disciplines: **Engineering, Science, Management**



Mexico Student Enrollment



Purdue Colleges (9)



Engineering

Agriculture

Science

Management

Technology

Pharmacy

Liberal Arts

Veterinary Medicine

Health & Human Sciences

Purdue College of Engineering

Aeronautics
and
Astronautics

Agricultural
and Biological

Biomedical

Civil

Chemical
10,700 alumni

Electrical and
Computer

Engineering
Education

Industrial

Materials

Neil Armstrong

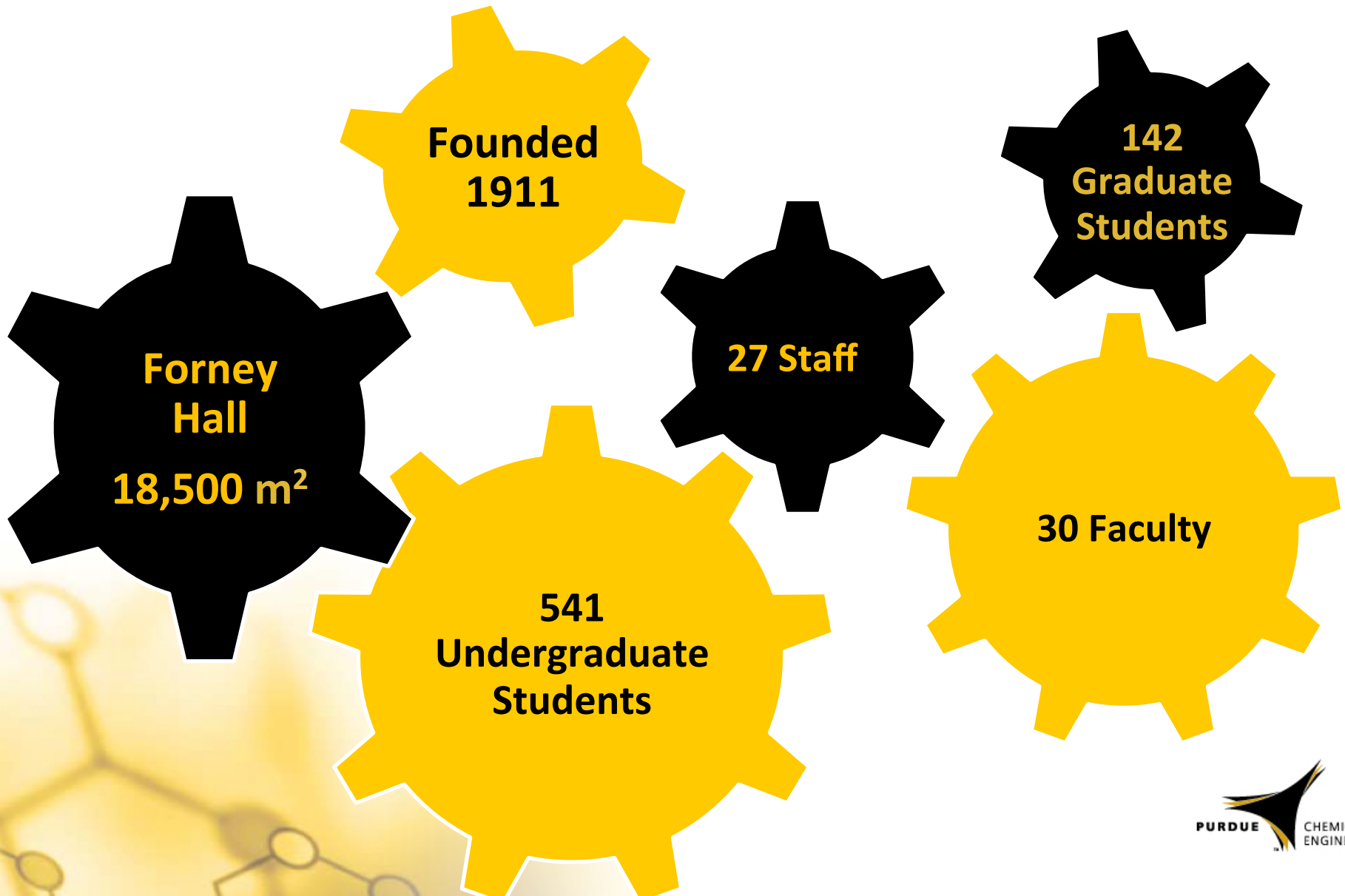
BS '55

23 total
Astronauts

Mechanical

Nuclear

Chemical Engineering Parameters



Discovery Park

Discovery Park is a hub for **interdisciplinary** and translational **research**, a place where **scholars from all disciplines work together** to define new areas of research and **solve grand challenges**.

- **Bindley Bioscience Center**
- **Birck Nanotechnology Center**
- **Burton D. Morgan Center for Entrepreneurship**
- **Global Sustainability Institute**
- Center for Predictive Materials & Devices
- Cyber Center
- Discovery Learning Research Center
- Oncological Sciences Center
- Purdue Center for Drug Discovery
- Regenstrief Center for Healthcare Engineering

Birck Nanotechnology Center

Provides a modern infrastructure to enable world-class science and engineering in for BioMEMS, BioNEMS, physiological sensing, microfluidics, and nanomedicine.

- **17,400 m²** , office space for 45 faculty and 180 grads
- 2,300 m² **nonfabrication clean room** and other specialized labs (precise temperature control, low vibration rooms, bioclean room)
- Provides staff and equipment to address **concept through characterization** services

Select Capabilities:

- Nanoscale Metrology
- Materials Growth and Deposition
- Nanoelectronics and Microelectronics
 - Nanofabrication
 - Electronic Characterization
 - Nanophotonics
- Bio-Nanotechnology & Nano-Chemistry



Bindley Bioscience Center

Interdisciplinary life sciences and engineering researchers collaborate to explore new technologies and scientific knowledge that impact the broad boundaries of plant, animal, and human diseases.

Facilities

- BioAnalytical Lab
- Proteomics Facility
- Physiological Sensing Facility
- Imaging Facility
- Metabolite Profiling Facility
- Flow Cytometry and Cell Separation

Areas of Research:

- Diet and Disease Prevention
 - Drug Discovery/Delivery
- Health and Disease Biomarkers
 - Nanomedicine
- Computational Life Sciences & Informatics
 - Cytomics and Imaging
- Innovative Instrument Development
- Infectious Disease and Interventions



Burton D. Morgan Center for Entrepreneurship

Aims to stimulate entrepreneurship in the Purdue community and serve as a resource for the citizens of Indiana and beyond.

Initiatives

- Certificate in Entrepreneurship and Innovation
- Technology Realization Program
- Entrepreneurial Leadership Academy
- Business Plan Competitions
- Elevator Pitch Competition

Facilities:

- First Discovery Park building, 2004, **2,880 m²**
 - Lecture & presentations room
 - Conference rooms, offices



Global Sustainability Institute

Aims to connect Purdue expertise with pressing global sustainability issues.



Center for the Environment facilitates research on hazardous electronic waste elimination; reducing nutrient runoff in farm systems; transport of new chemicals in soil and water.



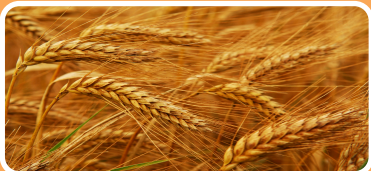
Climate Change Research Center built expertise in: coupled, biogeochemical cycles; climate change and extreme weather; hydroclimatology; impact and adaptation to climate change.



Energy Center grows the Purdue energy research and education enterprise; runs the Energy Academy for Purdue students and science teachers.



Water Community facilitates water-related research, teaching, and engagement to improve and sustain human and ecosystem health.



Center for Global Food Security ensures that we have enough food, feed and fuel for the 21st century and beyond.

August 2013



Founded	1961	2001
Purpose	Entrepreneurship, startups and university collaborations	Interdisciplinary research
Location	4 locations; West Lafayette off-campus, US 52 Highway	Main Campus State Street
# People	>4,000 employees	~1,000 faculty members
# Buildings	52	5
# Companies/ Centers	225 Companies	10 Core Centers
Area	725 acres in West Lafayette	40 acres

Purdue Research Park

The idea economy is here!®

Advancing Purdue's mission through:

- Faculty entrepreneurship, recruiting, retention, consulting
- Partnerships with industry
- Student learning, employment, engagement
- Job growth and economic impact
- Bringing ideas to the market



Purdue Research Park - continued

Locations	Companies	Employees
West Lafayette	164	3,557
Indianapolis	11	115
Merrillville	39	715
New Albany	11	166
Total	225	4,553

Purdue West Lafayette:

- Average salary **\$63K**
- **157,000 m²** total space
- 11 companies publicly traded

Resources provided:

- Equipment and facilities
- Technical assistance, business equipment
- Human resources/employment
- Media relations/marketing
- Flexible space and leases
- Security, administrative support
- Conference and meeting space



Online Education at Purdue

Engineering Professional Education (EPE) offers
courses, concentrations and MS degrees.

MSE

- Engineering Management, **57%**
(engineering, math, science and management coursework)

MSME

- Mechanical Engineering

MSAAE

- Aeronautical and Astronautics Engineering

MSECE

- Electrical and Computer Engineering

MSMSE

- Materials Engineering

MS

- Computer Science

Online Education – continued

- In 2013-14, **733** students were enrolled in Engineering Professional Education courses.
- 9% located in **23 countries** outside US
- 30 credits needed for a Master's degree
- **\$3,060** cost for a 3 credit course
- **430** companies sponsor their employees for the EPE online programs
- Purdue ChE will soon add some courses with the long term goal of offering a MS ChE

Purdue – Mexico

Center for Sustainability

- Established in 2012
- 25 faculty members and administrators involved
- **Goal: Expand Purdue's collaboration with Mexican institutions to include education and research in:**
 - Energy
 - Nanotechnology
 - Natural Disaster Mitigation
 - Water Management
- **Immediate objective:** Establish graduate student **funding agreement with CONACYT** to enable Mexican students to complete degrees at Purdue



Arvind Varma
Center Director



Enrico Martinez
Center Associate Director

Conclusions

- Purdue has exceptional facilities, programs and infrastructure to offer.
- There is room for growth in the Purdue –Mexico relationship.
- Long term collaboration in education and research is a win-win proposition.
- Participants are encouraged to engage and plan for collaborations while attending this workshop.
- CONACYT Agreement will enable students to attend Purdue in fall 2015 – recruiting and orientation can begin.



Thank you!