Discovery with Delivery

Richard O. Buckius
Vice President for Research

Academic Leadership Forum
February 8, 2012

- Faculty recognitions and research awards
- Facilities and infrastructure
- Research trends and partnerships
National Recognitions

Rakesh Agrawal
Winthrop E. Stone Distinguished Professor in Chemical Engineering

- Awarded the National Medal of Technology and Innovation from President Barack Obama
- Citation: “… an extraordinary record of innovations ... significant positive impacts on electronic device manufacturing, liquefied gas production and the supply of industrial gases for diverse industries.”
- 116 U.S. patents, nearly 500 non-U.S. patents and 93 technical papers

National Recognitions

Connie Weaver
Distinguished Professor, Head of Foods & Nutrition

- Awarded the Linus Pauling Institute Prize for Health Research
- The award is one of the most significant in the field of diet and nutrition, recognizing excellence in research and successful efforts to disseminate new knowledge to the public and the health profession.
National Recognitions

**Alexandra Boltasseva**
Assistant Professor of Electrical and Computer Engineering

- Named one of the world's top young innovators by *Technology Review* magazine, which recognizes 35 of the world's top innovators under the age of 35 in energy, medicine, computing, communications, nanotechnology and other emerging fields.

- Her research includes a new class of "plasmonic metamaterials" as potential building blocks for advanced optical technologies.

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National Recognitions

**Gebisa Ejeta**
Distinguished Professor of Agronomy
Executive Director, Purdue Center for Food Security
Member of the Board for International Food and Agricultural Development

**Willie Reed**
Dean, School of Veterinary Medicine
United States Department of Agriculture Secretary's Advisory Committee on Animal Health
Ulrike Dydake, Assistant Professor of Health Sciences, received over $2 million through an Outstanding New Environmental Scientist Award from the National Institute of Environmental Health Sciences.

Demetra C. Evangelou, Assistant Professor of Engineering Education, received the Presidential Early Career Award for Scientists and Engineers (PECASE), the highest honor given by the U.S. government to science and engineering professionals in the early stages of their independent research careers.

National Recognitions

- 3 new American Academy of Arts and Sciences members
- 13 new Fellows of the American Association for the Advancement of Science
- 8 new NSF Early Career Development Awards

L. Jamieson  
J. Melosh  
E. Negishi
Research Awards and Synergies

Launching Tomorrow’s Leaders

Research Goes to School

- $1.25 million over 2 years from National Science Foundation
- PI: Tim Sands, Provost
  Co-PIs: Maureen McCann, Biology; Gabriela Weaver, Chemistry; Sydney Moon, Education
- Goals:
  • Provide professional development to rural science teachers
    so they can develop lessons on topics such as alternative energy and climate change
  • Spark interest in STEM education

Research Awards and Synergies

Launching Tomorrow’s Leaders

National Genomics Research Initiative

- Howard Hughes Medical Institute’s Science Education Alliance
- PI: Kari Clase, Industrial Technology
  Co-PI: Jenna Rickus, Biomedical Engineering
- 3 years of funding for biotechnology lab courses
- Undergraduate students isolate and characterize bacteriophages from local soil; one is chosen to have its DNA sequenced and annotated.
Research Awards and Synergies

Meeting Global Challenges

Strengthening Afghan Agriculture Faculties Agreement

- $32 million over 5 years from U.S. Agency for International Development
- PI: Kevin McNamara, Agricultural Economics; Co-PI: Jesse Lowenberger-DeBoer, Agriculture International Programs
- Goal: Improve capabilities of Afghanistan’s agricultural universities
Research Awards and Synergies
Meeting Global Challenges

The Global Policy Research Institute

Seed grants
- Daniel P. Aldrich, political science
- Sophie A. Lelièvre, basic medical sciences
- Sonak Pastakia, pharmacy practice
- Paul V. Preckel, agricultural economics
- Leigh S. Raymond, political science
- Matthew Huber, earth and atmospheric sciences
- James M. Lowenberg-Deboer, agricultural economics
- S. Laurel Weldon, political science

Partnership grants with the Center for Global Food Security
- Thomas W. Hertel, agriculture
- Klein Ileleji, agricultural and biological engineering
- Betty Bugusu, International Food Technology Center
- Abdelfattah M. Nour, basic medical sciences

Discovery with Delivery

Center for Science of Information
- Indiana’s first National Science Foundation Science and Technology Center
- $25 million over 5 years
- Led by Wojciech Szpankowski, Saul Rosen Professor of Computer Science
- Partners: Bryn Mawr College; Howard University; MIT; Princeton; Stanford; UC Berkeley; UC San Diego; and Illinois
Discovery with Delivery

- **S. Laurel Weldon**
  Professor, Political Science
  Author, *When Protest Makes Policy: How Social Movements Represent Disadvantaged Groups*
  Media interest from: The Globe and Mail; Fox National TV; CBC TV (Canada); WIBC; Northwest Indiana Business Quarterly Magazine; South Bend Radio

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Discovery with Delivery

- **Eric Nauman**
  Associate Professor
  Mechanical Engineering
  Biomedical Engineering
  Basic Medical Sciences
  Concussion research
  Research supported by
  - Indiana State Dept. of Health's Spinal Cord and Brain Injury Research Fund
  - Indiana Clinical and Translational Sciences Institute
  - General Electric Healthcare
  - National Science Foundation Fellowship
  - National Defense Science and Engineering Fellowship Program
Facilities and Infrastructure

Herrick Labs
Center for High Performance Buildings

- $30.75 million ($11.75 million from National Institute of Standards and Technology; remainder from private donors)
- 63,991 gross square feet
- Living Laboratory, Performance Based Engineering Laboratory, Engine Test Cells, Vibration Electromechanical and Thermal Systems Laboratory

Facilities and Infrastructure

Multidisciplinary Cancer Research Facility

- $14.9 million from National Institutes of Health
- 28,603 gross square feet
- Support Disease Focused Research, Biofuels and Bionanotechnology Instrumentation
Facilities and Infrastructure

Drug Discovery Facility
- $25 million (bonds and gifts)
- 65,397 gross square feet
- Includes renovation of animal space and creation of an animal imaging center

Facilities and Infrastructure

Health and Human Sciences Research Facility
- $38 million (bonds and gifts)
- 129,545 gross square feet
- New home for Speech, Language, and Hearing Sciences; Medical Education; Clinical Facilities
- Adjacent Parking Garage – $16 million
FY10 Total R&D Expenditures
In millions; includes Medical Sciences

Source: Office of Institutional Research

FY10 Total R&D Expenditures
In millions; excludes Medical Sciences

Source: Office of Institutional Research
## Peer Comparison

### Research & Development Total Expenditures

<table>
<thead>
<tr>
<th></th>
<th>FY07</th>
<th>FY08</th>
<th>FY09</th>
<th>FY10</th>
<th>% chg 07-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan</td>
<td>$848,454</td>
<td>$915,818</td>
<td>$1,070,519</td>
<td>$1,184,441</td>
<td>39.60%</td>
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<tr>
<td>Georgia Tech</td>
<td>$476,138</td>
<td>$524,888</td>
<td>$565,487</td>
<td>$612,652</td>
<td>28.67%</td>
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<tr>
<td>Minnesota</td>
<td>$639,446</td>
<td>$700,841</td>
<td>$762,447</td>
<td>$785,926</td>
<td>22.91%</td>
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<tr>
<td>UC Berkeley</td>
<td>$570,252</td>
<td>$620,374</td>
<td>$682,568</td>
<td>$694,049</td>
<td>21.71%</td>
</tr>
<tr>
<td>Texas A&amp;M</td>
<td>$665,631</td>
<td>$604,526</td>
<td>$651,923</td>
<td>$688,014</td>
<td>21.64%</td>
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<tr>
<td>Purdue</td>
<td>$472,665</td>
<td>$495,099</td>
<td>$524,117</td>
<td>$572,865</td>
<td>21.20%</td>
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<tr>
<td>Iowa</td>
<td>$374,905</td>
<td>$300,422</td>
<td>$334,937</td>
<td>$443,841</td>
<td>18.39%</td>
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<tr>
<td>Texas</td>
<td>$502,786</td>
<td>$553,051</td>
<td>$566,166</td>
<td>$567,981</td>
<td>16.94%</td>
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<tr>
<td>Penn State</td>
<td>$665,131</td>
<td>$717,244</td>
<td>$765,037</td>
<td>$770,445</td>
<td>15.83%</td>
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<tr>
<td>Indiana</td>
<td>$413,028</td>
<td>$437,480</td>
<td>$465,669</td>
<td>$473,182</td>
<td>14.56%</td>
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<tr>
<td>Wisconsin</td>
<td>$912,219</td>
<td>$944,626</td>
<td>$1,013,649</td>
<td>$1,029,296</td>
<td>12.83%</td>
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<tr>
<td>Michigan State</td>
<td>$385,611</td>
<td>$392,242</td>
<td>$405,961</td>
<td>$430,890</td>
<td>8.92%</td>
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<tr>
<td>Illinois</td>
<td>$492,347</td>
<td>$518,333</td>
<td>$581,805</td>
<td>$513,945</td>
<td>4.39%</td>
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<tr>
<td>Ohio State</td>
<td>$737,324</td>
<td>$726,302</td>
<td>$743,591</td>
<td>$742,471</td>
<td>0.70%</td>
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<tr>
<td>Peer average, excluding Purdue</td>
<td>$584,098</td>
<td>$612,011</td>
<td>$662,289</td>
<td>$689,010</td>
<td>17.96%</td>
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</tbody>
</table>

## Awards by Agency

### FY10

- **National Science Foundation**: 23%
- **Dept of Health & Human Services(NIH)**: 18%
- **Industrials and Foundations**: 13%
- **PRF/PU**: 12%
- **Dept of Defense**: 9%
- **State/Local Govt**: 12%
- **Other Federal <$10M & Foreign Govt**: 11%
- **Dept of Energy**: 8%
- **State/Local Govt**: 6%

### FY11

- **National Science Foundation**: 22%
- **Dept of Health & Human Services(NIH)**: 18%
- **Industrials and Foundations**: 16%
- **PRF/PU**: 12%
- **Dept of Defense**: 9%
- **State/Local Govt**: 11%
- **Other Federal <$10M & Foreign Govt**: 10%
- **Dept of Energy**: 8%
- **State/Local Govt**: 6%
FY 10 Total and Research Expenses

Per Student

Research Expenses Per Student
Other Expenses per Student
Research Expenses per Student as Percent of Total Expenses

Data Source: IPEDS; Office of Institutional Research

Research Connections

FY11 Awards
$401M
West Lafayette Campus

Collab. Awards

100
50
10

Note: Areas of pie charts are proportional to award amounts
QUESTIONS?