Padma Raghavan
Distinguished Professor of Computer Science & Eng
Associate Vice-President for Research

Institute for Networking and Security Research
Industry Day 2014, April 1-2, 2014
Research@PennState

- Research by the numbers
- Research portfolio highlights
- IP@PSU: a fresh approach to catalyze industry partnerships
Research@PennState
...by the numbers
Research Expenditures & Source of Funds

FY2013 Total: $848,215,000

Federal $537,298,000
- Defense: $187M
- Health & Human Services: $129M
- NSF: $63M
- DOE: $50M
- USDA: $24M
- NASA: $13M

University $140,811,000

Commonwealth of Pennsylvania $69,071,000

Industry & Foundations $101,035,000
Research Expenditures by College

FY2013 Total: $848,215,000

- Information Science & Technology: $7,828,000
- Other Campuses: $15,464,000
- Eberly College of Science: $102,499,000
- Defense Related Research Units: $204,868,000
- Agricultural Sciences, Medicine, Earth & Mineral Sciences: $111,733,000 + $100,429,000 + $64,970,000 = $277,132,000
- Other Colleges: $11,265,000
- Engineering: $145,063,000
- Health & Human Dev: $42,967,000
- Liberal Arts: $29,334,000
- Education: $11,795,000
# NSF Science & Engineering Research Expenditures Rankings for FY 2012

(Released Nov 2013)

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| Ohio State           | 12               | 63                      | 98              | 26                   | 23                | 18               | 7               | 5                | 35                      | 42         | 29      | 32        | 67                     | -             | 31             | -             | 21          | 11               | 24                    | 18          | 45         | 26         | 26          | 24                    | 21         | 31          | 2         | 7        |
| UC Berkeley          | 11               | -                       | 114             | 39                   | 6                 | 3                | 123             | 192              | 9                       | 13         | 24      | 3          | 63                     | 110            | 23             | -             | 60          | -                | -                    | 62          | 22         | 50         | 73          | 49                    | 6           | 2           | 22        | 24         |

Number Top Ten Fields/Subfields: 12
Research@PennState

... some highlights
2009: “Ultimately we will be able control the behavior of communication networks in a way that allows people to exchange the most important information.” Tom L Porta (PI)

2013: "We're going to develop a new science of understanding how to make security-relevant decisions in cyberspace." Patrick McDaniel (PI)
Manipulating Single Cells & Organisms with Acoustic Tweezers

Penn State MRSEC DMR-0820404: X. Ding, S.-C. S. Lin, B. Kiraly, H. Yue, S. Li, J. Shi, S. J. Benkovic, and T. J. Huang

MRSEC researchers have developed a novel acoustic manipulation platform – acoustic tweezers – which can trap and manipulate single microparticles, cells and entire organisms along programmed routes in two dimensions within a microfluidic chip. “PSU” is spelled by moving a bovine red blood cell. The organism C. elegans can be manipulated and immobilized. With its non-invasiveness, miniaturization and versatility, these acoustic tweezers will become a powerful tool for many disciplines of science and engineering.
Towards a machine vision system that will approach the cognitive abilities of the human cortex.

“With this expedition, we are aiming to leapfrog the intelligence of these vision systems to approach human cognitive capabilities, while being extremely energy efficient and user friendly.”

Vijay Narayanan (PI)
What are sustainable, scientifically sound, technologically feasible, economically efficient, and ethically defensible climate risk management strategies?

“Our goal is to advance the foundations of sustainability research through an integrated and quantitative approach that links the social, economic and environmental components of climate risk management.”

Klaus Keller (PI)
Direct digital deposition uses complex computerized descriptions of objects to directly create objects by gradually depositing a variety of materials in specific locations.

- CIMP-3D allows industry participants to evaluate the technology.
- Industrial users will be able to develop, demonstrate, test and assess direct digital deposition quickly and inexpensively.

Rich Martukanitz, Tim Simpson, Gary Messing (Co-Directors)
A fresh approach to IP @PSU to catalyze industry partnerships
A company sponsoring research has the option to request ownership of Intellectual Property (IP) resulting from a sponsored project.

If all Penn State researchers involved in the project agree to release the IP, then the IP terms of the agreement will be such that any new IP generated will be the property of the sponsoring company.

A quick turnaround 5-step process for assigning ownership of the IP to a company sponsor.

Contact OSP at 814-865-1372 or osp@psu.edu or OTM at 814-865-6277 or otminfo@psu.edu

One-page flyer on IP policy changes.