School of Science
Spring Town Meeting
Curt Breneman, Dean
January 28, 2015
Topics for Today

• In the News: Faculty and Staff
• Performance Plan FY16 Highlights
• Institute-Wide Highest Priorities (iWHPs) Update
• New Initiatives and Developments
• State of Science
• Fun Stuff
In the News: Faculty and Staff

- Jim Hendler, Heng Ji – 2014 IBM faculty award
- Jon Dordick, Robert Linhardt – Fellows of National Academy of Inventors
- Bulent Yener – Fellow of IEEE
- Fran Berman – Fellow of AAAS
- Heidi Newberg – share of 2015 Breakthrough Prize in Fundamental Physics
- Xiaogang Ma – Data Stewardship Award
- Sandra Nierzwicki-Bauer – James D. Corbett Award
- Fran Berman – Board of Trustees, Alfred P. Sloan Foundation
In the News: Faculty and Staff

Faculty receiving new grant awards (since July 2014):

- Chris Carothers
- Petros Drineas
- Peter Fox
- Kelly Grindstaff
- Richard Gross
- Bill Henshaw
- Heng Ji
- Shawn Lin
- Robert Linhardt
- Deborah McGuinness
- Joyce McLaughlin
- Heidi Newberg
- Karyn Rogers
- SCNARC Center (Bolek Syzmanski)
- Chuck Stewart
- Humberto Terrones
- Bruce Watson
2014 SoS SuperTeachers

Faculty who achieved a DMS teaching evaluation:
• Score ≥ 4.75 Spring, ≥4.7 Fall;
• Class size of at least eight students (grad) or 10 students (undergrad);
• A 50% response rate (adding best large-format, most improved)

Spring 2014
• Kristin Bennett
• Barbara Cutler
• George Edick
• Robert Flint
• Greg Hughes
• Mimi Katz
• Mike Kupferschmid
• Wayne Roberge

Fall 2014
• Wayne Roberge
• Vincent Meunier
• Joyce McLaughlin
• Ashwani Kapila
• George Edick
• Mike Kupferschmid
• Karyn Rogers
• Carl Pavarini
• Bolek Szymanski
• Malik Magdon-Ismail

Coming Soon: Best Large-format, Most-Improved Teachers!
Jeffrey Banks ‘06

Eliza Ricketts Foundation Career Development Chair
Associate Professor, Mathematical Sciences

Dr. Banks joins Rensselaer from the Center for Applied Scientific Computing at Lawrence Livermore National Laboratory in California. His research interests include numerical methods for partial differential equations, fluid-structure interaction, computational fluid dynamics and solid mechanics, scientific computing, wave phenomenon, and laser plasma interaction. Banks earned his B.S., M.S., and Ph.D. from Rensselaer.
The New Polytechnic

Rensselaer is transformative through collaborative teaching, learning, and research across disciplines, sectors, and global regions; using advanced technologies to unite these perspectives, in order to take on large, multi-faceted challenges. 

*The Rensselaer Plan 2024* will enable this vision through pedagogical innovation, globally impactful research and a transformative student experience.

The School of Science will advance the Interdisciplinary Frontiers of Science through Leadership in Research and Education.

**Global Challenge-Linked Research**

We will become the unparalleled thought leaders in the fundamentals of life and matter, networks and information, and application data-driven knowledge to address global challenges across disciplines.

- Build on strengths in Transformational Molecules and Materials in structural, biological and energy domains
- Build on strengths in Powering a Resilient and Healthy Planet by leveraging existing expertise in solar energy conversion to launch a “Photons to Fuel” initiative
- Build on strengths in Data Analytics and Computational Modeling across multiple STEM domains
- Launch Rensselaer’s Materials Genome Initiative “MGI@RPI” that spans IDEA, cMDIS and multiple Departments across the SoS and SoE to develop a “Materials by Design” infrastructure in soft and hard materials
- Empower the Jefferson Project-IDEA synergy in freshwater data sensing, collection and analytics through strategic hiring

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**Enriching the Student Experience (CLASS)**

We will launch a “hands-on” collaborative learning initiative that emphasizes active, immersive, and diverse student experiences focused on the application of interdisciplinary science to problems of global significance.

- Develop Prize-lab / RCOS / Technology-Enabled Hands-on “Learning By Doing” experiences
- Create a Research Experience Opportunity for all Science undergraduates
- Encourage and enable students to take a Semester and / or Summer or Intersession Abroad
- Host project-based case study workshops linked with the Rensselaer Educational Collaboratory (“The REC”) and the Global Challenge Studio
- Help students to excel by promoting CLASS, near-peer mentors, and virtual bridge programs

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**Core Message**

The New Polytechnic

Rensselaer is transformative through collaborative teaching, learning, and research across disciplines, sectors, and global regions; using advanced technologies to unite these perspectives, in order to take on large, multi-faceted challenges.

**Key Differentiators**

The Rensselaer Plan 2024 will enable this vision through pedagogical innovation, globally impactful research and a transformative student experience.

**Proof Points**

The School of Science will advance the Interdisciplinary Frontiers of Science through Leadership in Research and Education.

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**Message Map Legend**

- Core Message
- Key Differentiators
- Proof Points
Global Challenge-Linked Research
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Leadership in Next Generation Technology-Enabled Pedagogy

We will provide an unrivaled cyber-powered educational experience that will enable our students to reach their highest levels of intellectual achievement as members of the transformed, technology-infused world of the future.

- Innovate in mixed-mode course delivery in Physics and Computer Science, develop Art in Science themes, and create Immersive Environments for Science Education
- Engage students in real world and Global Challenge problems across Schools
- Match Archimedeans and other top students with a Senior Thesis research advisors
Performance Plan FY’16 Highlights

- Develop Prize-lab / RCOS / Technology-Enabled Hands-on “Learning By Doing” experiences
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Enriching the Student Experience (CLASS)

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**iWHP:**
The Jefferson Project @ Lake George

**Personnel**
- Rick Relyea appointed Executive Director of The Jefferson Project

**Facilities and Sensors**
- Network of vertical profilers were deployed in October
- The Helen-Jo and John E. Kelly III ’78 Data Visualization Laboratory was dedicated in October 2014
- Additional deployments began in December 2014 and are ongoing:
  - 4 tributary stations
  - 3 weather stations
  - 3 acoustic Doppler current profilers
iWHP: Rensselaer IDEA

- New personnel being added, including 7 Ph.D. students funded from IDEA projects (HASS, SoE, SoS)
- IDEA Space “in the works”
- Senior faculty leadership team in place

New Developments in Research

- Healthcare analytics (Re Health) – publishable results coming soon!
- Agent-based dialog (Walt Disney)
- Natural language (Army Research Laboratory)
- Biome Informatics
- Materials Ontology
- Neuromorphic Computing
More iWHPs

Center for Materials, Devices, and Integrated Systems
- Establish Rensselaer Materials Genome Initiative (MGI@RPI)
- New faculty hire in Condensed Matter Physics

Partnership with GE Renewables
- Problem-based economic/science/engineering case studies
- Designing wind energy analysis lab on campus

CLASS
- NEW: Undergraduate poster sessions
- Student mentoring
- Mixed-mode classes
## New Developments and Projects

### Rensselaer Educational Collaboratory – “The REC”
- Beta classroom – space in the basement of the library
- New pedagogy to be tested
- Linda Schadler, Mary Simoni, Shekhar Garde and others working to establish The REC

### Global Challenge Studio / PrizeLab
- RCOS model
- Multi-disciplinary teams of students and faculty advisors
- Address problems of global significance
- Compete for national and international prizes
Art-“X” Nexus
(Art Across the Curriculum)

Goals of the Program:
• Allow students to develop tolerance for risk and ambiguity
• Launch pervasive integration of Art-“X” Nexus concepts across Schools
• Emphasize “process” rather than “product”

Program Activities:
• Develop or designate “creativity-intensive” courses
• Launch first week “Immersion Initiative”
• Art-“X” Nexus Symposium and Festival
Faculty Searches

- Neuroscience
- Cybersecurity/Risk/Privacy
- Expt. Cond. Matter Physics
- Chatter CD Chair/Ecology
Proposal Optimization Project (POP)

- Designed to accelerate time to “first funding” of new SoS faculty
- PIs may submit full proposal (at least one month prior to deadline) or specific aims page (at least 2 weeks prior to deadline)
- A mock review panel will provide feedback to PI
- Contact Freddy Colón for more information
#HackRPI

Rensselaer Hackathon

- Rensselaer student-led hackathon hosted 500 students from over 60 universities in Nov. 2014
- Student hackers spent 24 hours focusing on projects in hardware, web, data, mobile, video games & virtual reality, and humanitarian fields

Rensselaer hackers were recently ranked 9th in the Fall 2014 North America hacking rankings!
Fun Stuff!

New **School of Science** and **Biological Sciences** websites!

Journeys into Science

Research Photo Contest

*Check out the School of Science News and Events page for more details!*
Thanks for coming, and have a great Spring Semester!

For more School of Science updates, follow us on social media:

@RPIScience