

Minutes of PSNES Annual Meeting
PSU Reber Building & Telecon
April 16, 2011

Welcome & Member Roll Call

Pat Loftus called the meeting to order, and after a roll call, confirmed a quorum to conduct business.

PSNES Officers & Board Participants:

Pat Loftus – President
Rick Etling – VP/President Elect
Doug Wood – Interim Secretary/Treasurer
Arthur Motta – Ex-Officio NE Program Chair (with vote)
Kenan Ünlü – Board (RSEC Director/Faculty Representative)

PSNES Directors:

Ron Brown
Joe Sholtis
Jeff Jeffries
Jim Tusar – via telecon

Board Proxy Votes Available:

Ed Klevans – Director
Mark Lloyd – Director
Dick Gill – Director
Jim Stavely – Director
Len Pasquini – Past President

PSNES Members:

Hilary Neal
Rachel Heath (2011-2013 Director Elect) – via telecon
Jerry Gormley (2011 OEA Awardee) – via telecon

Other:

Karen Thole – Chair of Mechanical and Nuclear Engineering Dept. (part-time)
Don Lenze – College of Engineering
Tory Fryer – Department of Mechanical and Nuclear Engineering
Zach Van Horn – Ex-Officio ANS Student Chapter President (without vote) – via telecon
Susan Steward – PSMES President elect
David Sholtis – guest of Joe Sholtis

Old Business

- **Meeting Minutes Approval**

Meeting Minutes of January 31, 2011 were unanimously approved, noting that “NASA” should be “NNSA”. Approved minutes are posted on the PSNES website.

http://www.mne.psu.edu/Alumni/PSNES/Minutes/1_2011Minutes.pdf

- **Financial Report**

Tory Fryer gave the following financial report which reflected no changes from the January 31, 2011 meeting:

General Fund -- \$4447.26
Student Award Fund -- \$3200.00

- **PSNES Election Results**

The election results were nearly unanimous with the following officers elected:

Jim Stavely – Vice President/President Elect (2011-2013 – VP, 2013-2015 President)
Ron Brown – Secretary/Treasurer (2011-2013)
Rachel Heath – Board of Directors (2011-2015)
Joe Sholtis – Board of Directors (2011-2015)
Jim Tusar – Board of Directors (2011-2015)

There remains one open at-large Director position with a term 2011-2015. The Board can fill with an interested person by appointment some time in the future.

It was noted that several existing/new Board members were not able to participate due to work related obligations.

Following this meeting, Doug Wood, Interim Secretary/Treasurer, will be re-assuming his Director position (ending 2013)

The 2009-2011 Board was recognized for their contributions. Out-going Board Members not returning to the Board (Jeff Jeffries, Len Pasquini, and Mark Lloyd) were encouraged to continue participation. Pat read a note from Len Pasquini (Past PSNES President).

- **Mentoring Program**

The mentoring program has been active, with Pat Loftus, Rick Etling, Joe Sholtis, Doug Wood, Jim Tusar and others participating.

It was noted that we get a lot of activity in the mentoring program when the school recruiting season starts. It was further noted that the entering junior class is expected to be 110 students and that many may be requesting mentoring.

Jeff Jeffries commented on the importance of mentoring. Rick Etling said that the mechanical engineering program was looked at for “lessons learned”. Pat Loftus said that students want the mentoring program to be student driven at their pace and path of communication.

Tory Fryer was commended for her work putting the mentoring info onto ANGEL.

Hilary Neal shared her personal positive networking/mentoring experience which was noted as a good example that could be shared as she is a recent grad.

Doug Wood suggested recruiting graduating seniors as mentors. It was noted that grads are automatically members of PSNES and that they are encouraged to keep in touch.

Jim Tusar routinely comes to the career fair and would like to know if there was some way to note when mentors would be on campus. Arthur Motta suggested a Facebook function.

Rachel Heath suggested adding an on-campus mentor meeting to the PSNES meeting schedule.

Tory Fryer commented that the Penn State Mechanical Engineering Society (PSMES) actively encourages mentorship at fall orientation and has structured the “matching” to be almost real-time.

Hilary Neal suggested that a picture and a bio for potential mentors would go a long way.

Action: Tory Fryer suggested including short bio summaries (in lieu of comprehensive bios) on ANGEL for mentor volunteers; plus consider adding a photo.

Action: Arthur should reissue a note to the students at the beginning of the fall term to encourage them to participate in the mentoring program.

- **Alumni Outreach Brainstorming Session and Next Steps**

Rick Etling said an outreach program should reach new grads.

Arthur Motta gave the following figures:

There are 1400-1500 PSU NucE grads.

About 240 are members of PSNES to the extent that they receive info.

There are between 10-25 active members.

The suggestion was made of putting an invitation to join PSNES in the Mechanical and Nuclear Engineering magazine.

It was noted that an invitation could be placed on the website, but that this would reach only those who are already active or engaged with the program to some extent.

Arthur Motta suggested that Alumni network other Alumni to spread the word.

Doug Wood suggested publishing a list of “missing” alumni as part of an alumni outreach initiative.

Ron Brown suggested going on the PSU alumni/ae website and doing a search for all nuclear grads in order to get updated addresses.

Hilary Neal suggested identifying clusters of NucE grads and doing “meet and greets”.

Rachel Heath suggested the persuasiveness of a personal e-mail from an acquaintance. Jim Tusar contacted Rachel which resulted in her being a 2011-2013 Director Elect.

Jeff Jeffries noted that there were a lot of PSU NucE graduates in the “Triangle” area.

Action: Rick Etling suggested starting a subcommittee to track down alumni/ae and members, with four to five action plans. Rick Etling, Joe Sholtis, Jeff Jeffries, Hilary Neal and Rachel Heath volunteered.

E-mail comments from Jim Stavely on this subject are attached hereto as Exhibit A.

- **Nuclear Engineering Time Capsule**

Joe Sholtis suggested that the questions regarding the time capsule contents and the time capsule location should be separate and addressed by two separate subcommittees. Each subcommittee would have its own budget and timeline. Joe further stated that this may involve temporary locations for the capsule.

A final proposal would be submitted to the Board in this regard.

It was noted that contributions of content for the time capsule may be a tool to reconnect with some alumni/ae.

Scheduling would be pushed back to this fall. Each subcommittee should include at least an ANS student group member, a current professor and a retired professor.

The subcommittee on capsule location would further require input from the University.

It was envisioned that the time capsule would be 1-2 cubic feet and would probably cost a couple of hundred dollars.

It was suggested that contents should be accessible in the interim to accommodate changes in digital format.

Rick Etling emphasized that the contents should be interesting.

Karen Thole commented that at Stanford, every graduating class had a time capsule.

Don Lenze stated that archivists discourage digital formatted contents, but rather paper contents. Don further suggested that class gifts may be considered for supporting a time capsule for each class.

Joe Sholtis suggested asking for relevant pictures as part of alumni/ae contact.

As in prior PSNES meetings, the Board re-affirmed their support to continue proposal development.

Action: Joe Sholtis asked for volunteers for the time capsule subcommittees. Rick Etling, Ed Klevans, and Don Lenze volunteered for the contents subcommittee. Karen Thole volunteered for the location subcommittee (as it is likely to be in her building) along with Hilary Neal and Pat Loftus.

Rick thanked Joe for his effort on the time capsule project.

New Business

- **Department Update - Dr. Karen Thole's Presentation**

Dr. Thole made a presentation regarding the Mechanical and Nuclear Engineering Department at Penn State. The PowerPoint slides from Dr. Thole's presentation are attached as Exhibit B.

The Wall Street Journal reports that Penn State is ranked number one by recruiters.

President Obama visited Penn State in February, including a visit to the Energy Hub.

Dr. Thole reports that state support for Penn State (and other state schools in Pennsylvania) is expected to be cut by fifty percent. Excluding the medical program and the sports programs, this translates to an 8.5 percent cut in academic programs. The Departments are being asked to prepare for a five percent cut.

Dr. Thole reports that the Mechanical and Nuclear Engineering Department is in a strong position to weather these circumstances. There is no faculty hiring pullback. Four faculty members were hired last year. This week, another candidate, Max Fertoni, accepted an offer for a NucE faculty position, to start in January 2012.

Dr. Thole reports that the Mechanical Engineering program has a GPA cut-off of 3.0 and is expecting 322 students in Fall 2011. This is 42 percent over the limit of 230.

In Fall 2011, there are 83 NucE students (not including dual degree ME/NE majors) signed up for NucE 301, with 118 total students (including dual degree students). It was noted that NucE has a 2.0 GPA cut-off.

Dr. Thole stated that several engineering majors have enrollment limits and a GPA cut-off. Because NucE has a low GPA cut-off, a lot of students wind up in nuclear. Dr. Motta is working on a GPA cut-off of 2.8 which is supported by the Nuclear Power Advisory Board.

Dr. Thole said that there are 39 Engineering Ambassadors – students who do high school outreach, typically at central Pennsylvania schools – and that 12 of these are Mechanical or Nuclear Engineering students.

- **Program Update - Status of the NucE Program and Japan Outreach – Arthur Motta**

Dr. Arthur Motta gave a presentation regarding the status of the NucE Program and Fukushima Event Outreach. The PowerPoint slides from Dr. Motta's presentation are attached as Exhibit C.

Dr. Motta reported that a new faculty member, Dr. Massimiliano Fratoni, has been hired. Dr. Fratoni's specialties are reactor physics and the nuclear fuel cycle.

Dr. Motta reported that undergrad enrollment in the NucE program will climb to 120 for Fall 2011.

Dr. Motta reported that a summary of the accident at Fukushima is available on the department website.

- The PSU student ANS chapter is doing an outreach program regarding the facts of the events at Fukushima.
- The outreach program includes talking to local media.
- The outreach program includes interviews with radio stations.

- The outreach program includes contact with the national press, including ABC news, MSNBC and other networks.
- The outreach program includes participation in a WPSU panel.
- Dr. Motta has spoken with Brazilian network television.

Dr. Motta reported that the primary earthquake in Japan, triggering the tsunami, had an energy release of thirty times the design basis for the Fukushima reactors. The three-minute energy release from this earthquake was equal to two percent of the annual energy consumed in the United States. Honshu, the main island of Japan, moved 24 feet closer to the United States as a result of this earthquake. In contrast, a seventy foot tsunami was triggered in 1896 by an earthquake with a 7.0 reading on the Richter scale.

- **RSEC Update - Report from Dr. Ünlü**

Dr. Kenan Ünlü gave a report regarding the Radiation Science and Engineering Center and related topics. The PowerPoint slides from Dr. Ünlü's presentation are attached as Exhibit D.

Dr. Ünlü, Director of the Radiation Science and Engineering Center reported that NucE 401,450, 451, 497F and 0025 (freshman orientation) involve the RSEC. Furthermore, various outreach activities (e.g., high school and Boy Scouts) involve the RSEC.

Further, a DOE-NNSA GTRI (Global Threat Reduction Initiative, a Nuclear Security Education Program) and a Consortium for MO-99 Production with Low-Enriched Uranium (LEU) Target are involved with the RSEC.

There is radioisotope production, especially for nuclear medicine, operating at the RSEC.

There is a nine million dollar project (4.5 million dollar match from PSU) for an RSEC Neutron Beam Laboratory Addition project.

There are security enhancements at the RSEC.

- **Student ANS Report**

Zach Van Horn reports that a fall outreach program has started at the Radiation Science and Engineering Center, including an Honors Institute Tour of the Radiation Science Laboratory by approximately 300 high school students. There is a suggestion to have content in the HUB (Hetzl Union Building) to point out the reactor on the campus map. There have been three Saturday meetings at the reactor with Boy Scouts, with 200 Boy Scouts getting Nuclear Science merit badges.

There was an outreach activity regarding the Fukushima nuclear accident, with a public forum on the Tuesday following the earthquakes.

Thirty-five (35) PSU students went to the ANS student conference in Atlanta. A subsequent e-mail from Zach confirmed that two PSU NucE students, Matthew Pitman and David Spengler, won best paper awards in their category and that Sean Brennan won \$500 and a trip to Oak Ridge National Labs to give his presentation there. There will be one more student ANS meeting and pizza party this school year.

Michael Pantano is the President elect and will replace Zach as a non-voting Board member.

- **PSEAS Update**

Jim Stavely was not present to provide a PSEAS update. Minutes from the April 6, 2011 PSEAS meeting are attached hereto as Exhibit E.

- **PSNES Service and Leadership Award Committee**

Jim Tusar has again volunteered to lead this committee.

Arthur Motta asked about the timeline. The Nomination period typically begins in August/early September and runs through early October. The Awardee is selected in October and announced with fund disbursement at this time to enable consideration in resumes/graduate school applications. Formal recognition takes place at the Annual MNE Banquet.

Ed Klevans, Ron Brown and Jeff Jeffries volunteered to stay on this committee.

It was noted that the nomination form should clearly indicate class standing as a visible means of confirming eligibility. (Lessons Learned from prior year Award process.)

- **Penn State Mechanical Engineering Society**

Susan Stewart is the incoming President of the Penn State Mechanical Engineering Society. She shared some lessons learned/continuous improvement activities related to the PSMES Mentoring Program and some preliminary ideas on alumni outreach.

Action: Rick Etling will follow up with Susan to capture best practices for consideration in PSNES.

- **Round-Table – Summary of Actions & Future Events**

Attendees were given a chance to provide any news or updates.

Action: Members were asked to send any revisions to the PSNES pamphlet to Rick, Tory or Pat by April 21st in order to enable a revision to be available for Senior Send-Off at the end of April.

Action: Current/New Board Members, please send contact info to Tory for incorporation into a 2011-2013 Board Roster.

A Program/PSNES Reception is planned during the national ANS meeting the evening of October 31 at the Omni Shoreham Hotel in Washington DC.

Rick Etling suggested that the 3rd Quarter PSNES meeting via telecon be held in August or September.

Action: Rick has the action to propose dates for the 3rd quarter telecon.

Pat Loftus was honored for her time, efforts and enthusiasm as President.

- **Turn-over to New Officers and Board Members**

Pat Loftus officially turned the gavel over to Rick Etling and the new board.

Adjournment

The meeting was adjourned at 11:55am.

Exhibit A

Brown, Ronald Erik

From: Patricia Loftus [patriciaaloftus@hotmail.com]
Sent: Saturday, April 16, 2011 10:40 PM
To: james.stavelyjr@pseg.com; Brown, Ronald Erik; dcw@adventengineering.com; etlingrr@westinghouse.com; patriciaaloftus@hotmail.com
Subject: FW: PSNES 04/16/11 Meeting
Attachments: PSEAS_Conf_Call_Minutes_04_06_11.docx

Jim,
 Thank you.

Ron and Doug,

Could you please incorporate the PSEAS info and Jim's thoughts into the PSNES draft minutes.

Thank you.

Pat

> From: James.StavelyJr@pseg.com
 > To: patriciaaloftus@hotmail.com; etlingrr@westinghouse.com
 > Date: Fri, 15 Apr 2011 20:00:17 -0400
 > Subject: PSNES 04/16/11 Meeting
 >
 > I plan on calling in tomorrow. Below are some thoughts in case there is a problem with the conference call. Again, I'm sorry that I am unable to make it up for the meeting.
 >
 > 1) Not surprisingly, PSEAS is looking for new ways to reach out to alumni, rope them in, and encourage them to support PSU (sounds familiar?). With respect to generic outreach to Engineering alumni, we should be able to take advantage of these efforts.
 >
 > 2) From my perspective, we need to focus our alumni outreach on what makes us "distinct" from other engineers and build on existing networks that are focused on nuclear engineers. For example, I've opened discussions with the President of the local chapter of NAYGN. I would like to attend their meetings and promote PSNES. Even though this group covers many schools, it will have a higher percentage of PSU nuclear engineers than a lot of other groups. So, what other groups or associations focus on nuclear engineers (e.g. BWROG, PWROG, ...)?
 >
 > 3) Similarly, what activities like the time capsule can appeal more to nuclear engineers than other engineers?
 >
 > 4) A least one APG is accepting "general purpose" funds to support their department. These funds are not tied to an award but are used in direct department support. Perhaps we can look at this type of initiative since our awards have been or are shortly becoming fully endowed.
 >
 > Attached are the latest PSEAS minutes.
 >
 > Jim
 >
 >
 >
 >
 >
 >

> -----
> The information contained in this e-mail, including any
> attachment(s), is intended solely for use by the named
> addressee(s). If you are not the intended recipient, or a person
> designated as responsible for delivering such messages to the
> intended recipient, you are not authorized to disclose, copy,
> distribute or retain this message, in whole or in part, without
> written authorization from PSEG. This e-mail may contain
> proprietary, confidential or privileged information. If you have
> received this message in error, please notify the sender
> immediately. This notice is included in all e-mail messages leaving
> PSEG. Thank you for your cooperation.

Exhibit B

**The
Mechanical and Nuclear
Engineering Department**
at
The Pennsylvania State University

Karen A. Thole, Professor and Department Head

April 2011



The good news: in September 2010, the WSJ ranked Penn State #1 Among recruiters....and Obama visited in February

PATHS TO PROFESSIONS | SEPTEMBER 13, 2010
Penn State Tops Recruiter Rankings
 Companies Favor Big State Schools With One-Stop Shopping for Graduates With Skills

By TERRY EVANS
 (Please see Corrections & Amplifications item below.)

State universities have become the favorite of companies recruiting new hires because their big student populations and focus on teaching practical skills gives the companies more bang for their recruiting buck.

Under pressure to cut costs and streamline their hiring efforts, recruiting managers find it's more efficient to focus on fewer large schools and forge deeper relationships with them, according to a Wall Street Journal survey of top corporate recruiters whose companies last year hired 43,000 new graduates. Big state schools Pennsylvania State University, Texas A&M University and University of Illinois at Urbana-Champaign were the top three picks among recruiters surveyed.

Recruiters say graduates of top public universities are often among the most prepared and well-rounded academically, and companies have found they fit well into their corporate cultures and over time have the best track record at their firms.

Employers also like schools where they can form partnerships that allow them to work with professors and their students, giving them an inside track when it comes time to make offers for internships and jobs.

THE WALL STREET JOURNAL
 Digital Network
 Tuesday, September 20, 2010 11:18 AM EDT New York 77°(68°)

THE WALL STREET JOURNAL COLLEGE RANKINGS

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Reinvest Career Strategies Business Schools College Rankings

PATHS TO PROFESSIONS

Penn State Tops Recruiter Rankings

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- ◊ The project editor answers your questions
- ◊ Explore a Path to a Profession
- ◊ See a slideshow of 12 Career Paths
- ◊ Most Satisfying Jobs Happiness Index
- ◊ Employers Favor State Schools for Hires
- ◊ Top 25 Recruiter Picks | Rankings by Majors
- ◊ Recruiters' Comments on Top Picks
- ◊ Why State Schools Top the List
- ◊ A Focus on Critical Thinking
- ◊ Some Chefs Stay Close to Alma Mater
- ◊ Interns Are the New Full-Time Hires
- ◊ Are You Entitled? Take Our Quiz
- ◊ Research Agreements Pay Big in Jobs
- ◊ Your Personal Return-on-Investment
- ◊ The GPS Factor in College Recruiting
- ◊ College Resource Guide

RANK	SCHOOL	RECRUITING COS.*	SAMPLE OF RECRUITER COMMENTS
1	Penn State	436	'Bright, well-rounded students...with the core competencies we desire'
2	Texas A&M	Not available	'Proximity to key operations, quality of candidates and breadth of programs which match our recruiting needs'
3	University of Illinois	420†	'Graduates...perform well and tend to stay with the company'
4	Purdue University	414	'Longstanding relationships, great deal of executive involvement, well-rounded programs'
5	Arizona State	261‡	'Strong ties between our employees and the professors'

*Companies that came to campus to recruit in 2009 †Employers interviewing at career fairs ‡Recruiters in main university career center only; individual career centers at internal colleges have additional recruiters
 Source: WSJ survey, schools



The bad news: the state plans to reduce Penn State's support by 50% (\$182M)

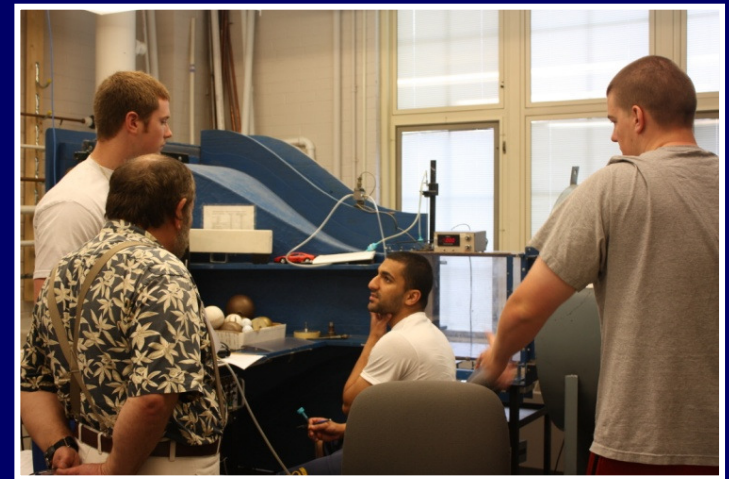


Budget reductions are currently slated at ~8.5% for academic programs

New Faculty in MNE

Growth of Undergraduate Enrollments

Growth of Global Activities



Penn State's Mechanical and Nuclear Engineering Department:

- Includes 50 faculty; 240 graduate students; 835 undergraduates
- \$27M in research expenditures for 2009-10

Announcement of Administrative and Endowed Chairs

Arthur Motta

Nuclear Engineering Program Chair



Chao-Yang Wang

William A. Diefenderfer Chair of Mechanical Engineering

Marty Trethewey

Arthur L. Glenn Professorship of Engineering Education



Latest faculty additions

Dr. Hosam Fathy

2003 PhD, U of Michigan

Founder/Director, Control Optimization Lab, U of M

Area of expertise is control-oriented modeling of health in batteries;
optimal power management in sustainable energy



Dr. Igor Jovanvic

2001, PhD, University of California

Assistant Professor, Purdue

Area of expertise is development of experimental methods related
to nuclear fusion and radiation detection



Dr. Zoubeida Ounaies

1996, PhD, Penn State

Associate Professor, Texas A&M

Area of expertise is tailoring microstructure properties to that provide unique
combinations of mechanical, electrical, and coupled properties



Larry Sharpe

1999, MSME, NCSU

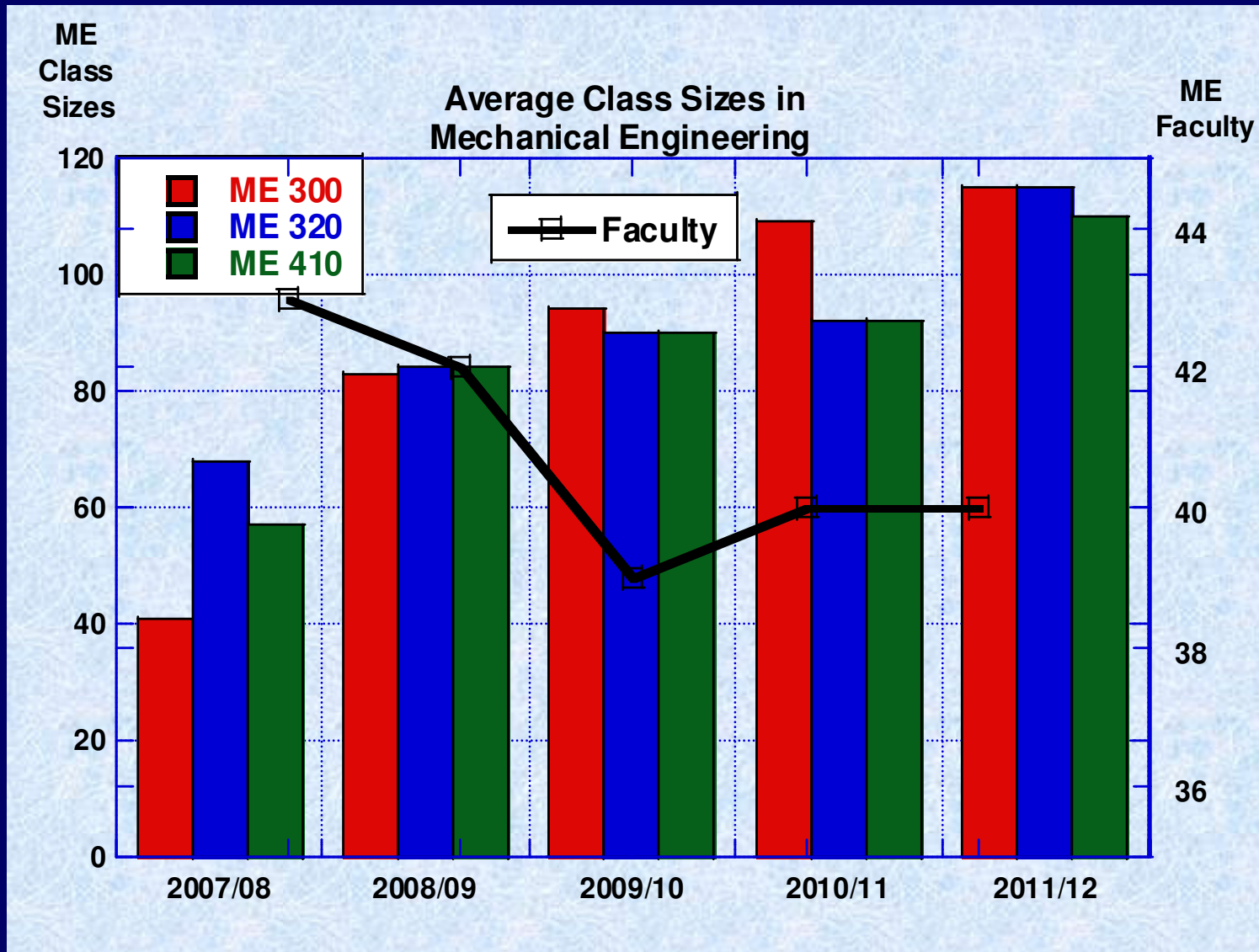
Previously held Director of Undergraduate Programs at UNC-Charlotte. Worked as an ME for Duke Energy and Progress Energy.



This past year, ME enrollments will be 42% over the enrollment limit of 230 students

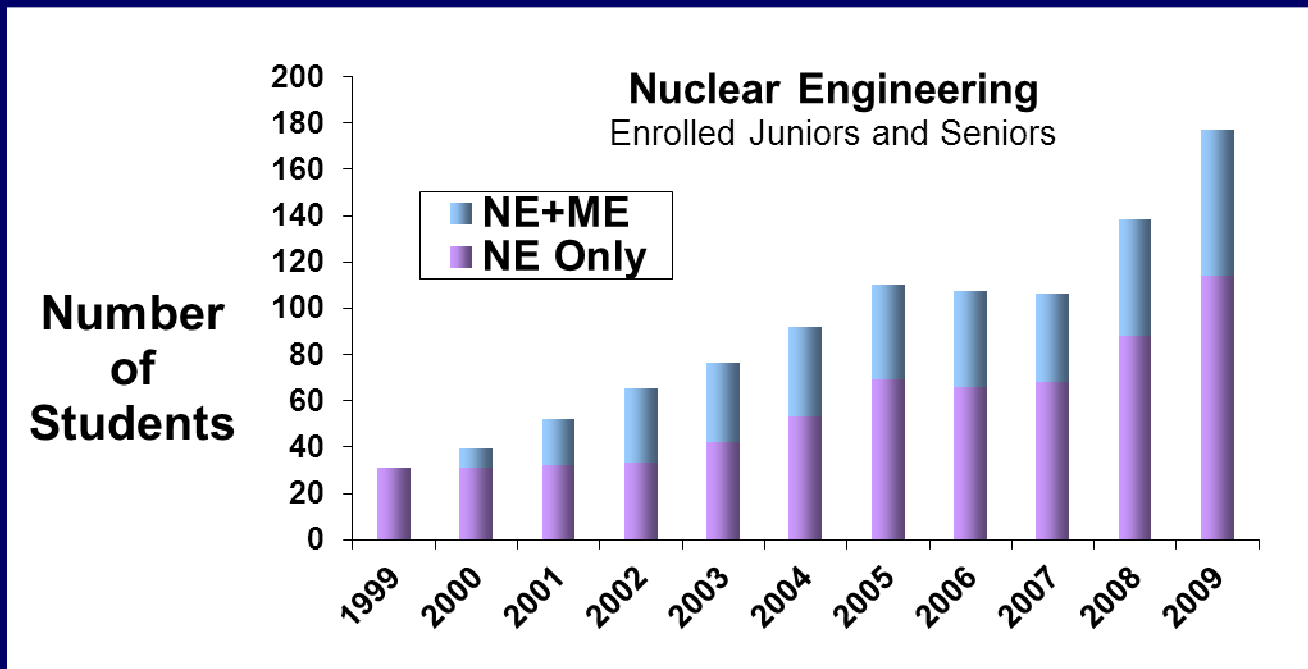
Year Entering into ME	Students Accepted	Students turned Down (1st Pref-ME)	Minimum GPA Cut-off
Fall 2003	299		-
Fall 2004	232	64	2.86
Fall 2005	249	70	2.87
Fall 2006	248	43	2.79
Fall 2007	247	51	2.82
Fall 2008	289	72	2.86
Fall 2009	265	102	2.98
Fall 2010	273	97	3.00
Fall 2011	322	62	3.00

Average class sizes have grown by a factor of nearly three for the ME required courses

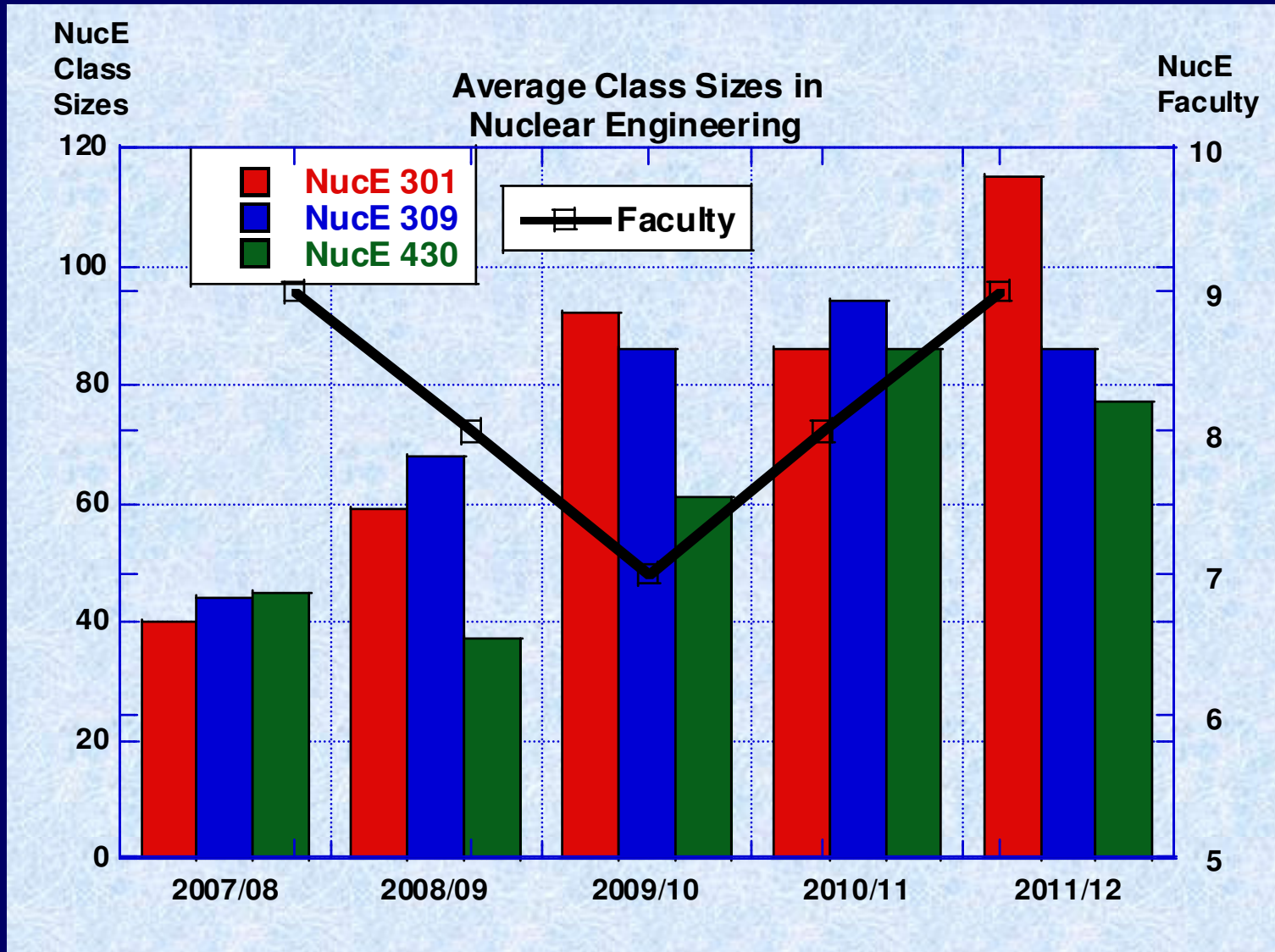


Nuclear enrollments have hit a historic high

Year Entering into NucE	Students Accepted	Minimum GPA Cut-off
Fall 2007	30	2.0
Fall 2008	43	2.0
Fall 2009	53	2.0
Fall 2010	81	2.0
Fall 2011	83(not including dual)	2.0



Nuclear engineering classes have also grown by a factor of two



Senior capstone projects with SJTU and U of Tokyo are taking place in the spring 2011

6 Project Teams

Mechanical Engineering

Industrial and Manufacturing Engineering



1 Project Team

Nuclear Engineering



THE UNIVERSITY OF TOKYO



TOSHIBA



The PSNES Leadership & Service and the John J. Brennan Excellence Awards were given to two outstanding students



Michael Pantano
PSNES Leadership & Service
Award Recipient



Philip Sahn
John J. Brennan Excellence in Nuclear
Engineering Award Recipient

The Toshiba-Westinghouse Undergraduate Fellows took place this summer with seven students



PENN STATE'S TOSHIBA-WESTINGHOUSE
Undergraduate Fellows Program







SPEND YOUR SUMMER AT PENN STATE!

Penn State is pleased to announce the Toshiba-Westinghouse Undergraduate Fellows Program! This ten-week paid summer program on Penn State's campus provides an unparalleled opportunity for hands-on research and professional development in the nuclear field at one of the nation's top research universities.

Students will work with a faculty mentor and utilize Penn State's state-of-the-art nuclear research facilities. One facility of particular distinction is the Breazeale Nuclear Reactor, located at the Radiation Science and Engineering Center (RSEC).

PROGRAM HIGHLIGHTS:

- \$6,000 stipend for 10-week program
- Additional allowance for relocation
- Campus housing provided
- Hands-on research activities
- Travel to nuclear sites including Three Mile Island
- Experience summer at Penn State!

WWW.MNE.PSU.EDU/TWFP

PROGRAM DATES:
May 27 - August 6, 2010

APPLICATION DEADLINE:
February 12, 2010

In addition to the research opportunities, students will participate in technical seminars and professional development workshops on topics like scientific communication and grad school admissions.

Site visits will be organized to sites relevant to nuclear power, including a tour of Three Mile Island and Westinghouse Electric Company in Pittsburgh. Students can also take part in social activities on campus. Penn State is a great place to be in the summer!

U.S. citizens or permanent residents who have completed their sophomore year of study with a 3.00 GPA or higher and who are pursuing bachelor's degrees in engineering, physics or chemistry with an interest in the nuclear field are eligible to apply.

WWW.MNE.PSU.EDU/TWFP



This publication is available in alternative media upon request. Penn State is committed to affirmative action, equal opportunity, and the diversity of its workforce. U. Ed. 10-28





Over 100 posters mailed to top engineering departments

Article in the November issue of *Nuclear News* magazine

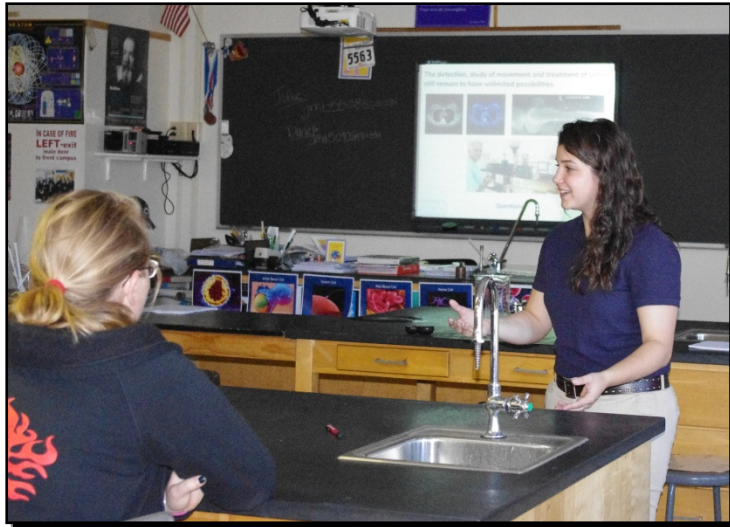
Seven students (MIT, Cornell, OSU, TAMU, PSU, etc)

The Engineering Ambassadors lead student-based outreach and recruiting for the College of Engineering



39 Ambassadors total

12 Mechanical and Nuclear Engineering Students



High School Outreach
10 visits per year



On-Campus Recruiting
4 tours per week
2-4 presentations per week



Community Events



The research expenditures for MNE are holding

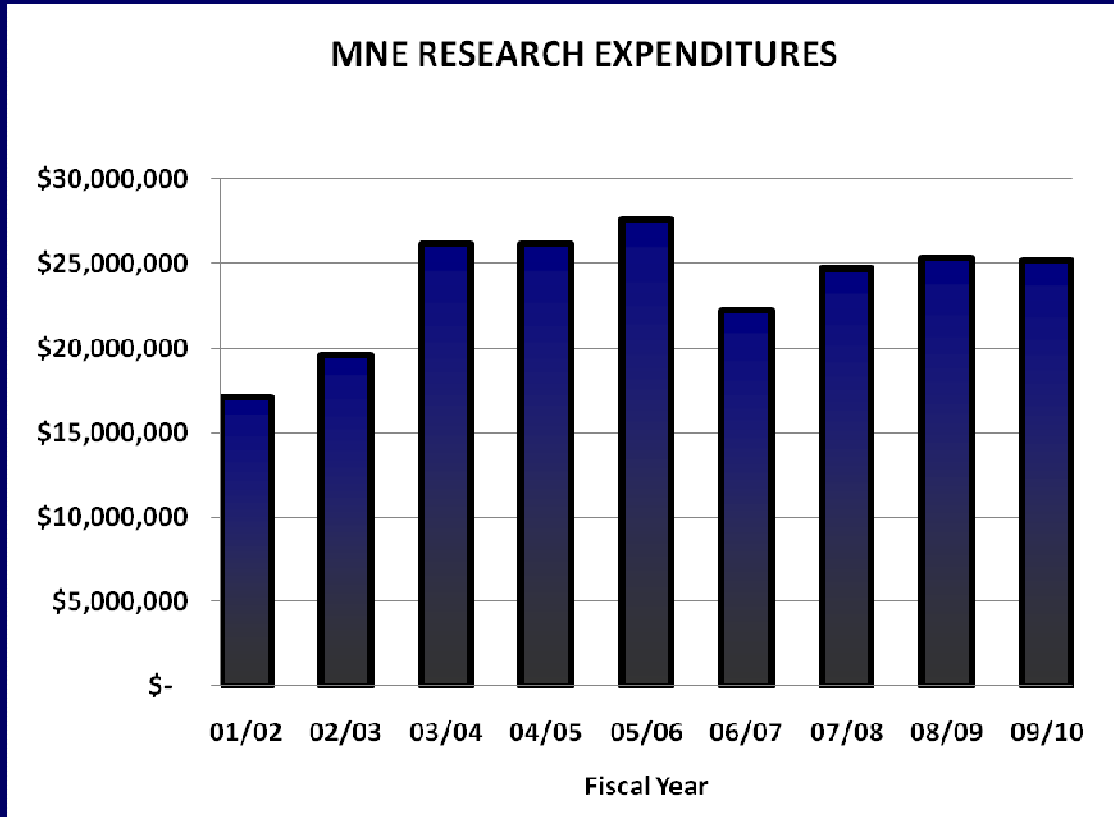
2009

University = \$717M
(\$105M from industry)

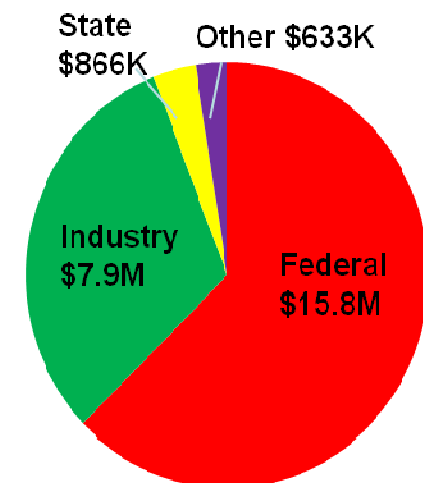
College of Eng = \$104M

ME research

expenditures are 4th
highest in NSF Total S&E
Rankings



Research Expenditures 2009/2010



In summary....

The MNE Department has high enrollments, many activities, and much potential



Exhibit C

Status of NucE Program and Japan outreach

Presentation to PSNES Arthur Motta, April 2011

NucE Program news

- New faculty member Dr. Massimiliano Fratoni (from Livermore, and UC-Berkeley) Faculty Development Grant from NRC
- Research area: Reactor Physics and Nuclear Fuel Cycle
- UG Enrollments continue to climb (est. 120 for Fall)
- Graduate program had excellent application pool this year.

Outreach for Japan Issue at Penn State

- Prepared summary of the event (posted on website)
- ANS has been doing outreach. Presentation to PSU community March 15, Walker Bldg. , Reactor staff also fielding questions from concerned parents and others.
- Talking to local media (WPSX-Morning Edition, Daily Collegian, Comm Radio, Harrisburg Patriot News)
- Interviews to radio stations (Pittsburgh, Salt Lake City, Voice of America , WHYY, among others)
- National Press (National Journal, National Post, Christian Science Monitor, others)
- Background to ABC News, other news organizations
- WPSU panel last Thursday
- Brazilian network TV
- On day of accident: I. Jovanovic on MSNBC

Panel on WPSU TV



- On Thursday, March 24, Chair of Nuclear Engineering **Dr. Arthur Motta** was featured on a panel of Penn State experts discussing the current Japanese nuclear crisis and the future of nuclear energy on WPSU-TV.
- The live program, “Nuclear Energy: Lessons From Japan,” aired on WPSU and was also streamed live online. The program in its entirety can now be viewed on the WPSU website or on WPSU’s YouTube channel: <http://www.youtube.com/wpsu#p/a/u/0/y41LJbOyHoE>
- Along with Dr. Motta, the program featured **Dr. James Freihaut**, Associate Professor of Architectural Engineering, **Dr. Charles Ammon**, Professor of Geosciences, and **Dr. Yumiko Watanabe**, Research Associate in Geosciences and a survivor of the March 11 earthquake and tsunami.

Forum on Japan on one
month anniversary of
earthquake

Organized by Penn State
Center for Global Studies

Disasters in Japan

a community discussion



Monday, April 11, 2011

(one month anniversary of the earthquake)

Reception 6:30-7:00 PM

Panel 7:00-9:00 PM

Greg Sutliff Auditorium, Lewis Katz Building

John Kelmelis, Moderator

Professor, School of International Affairs

Charles Ammon

Professor of Geosciences
College of Earth & Mineral Sciences

Gregory Smits

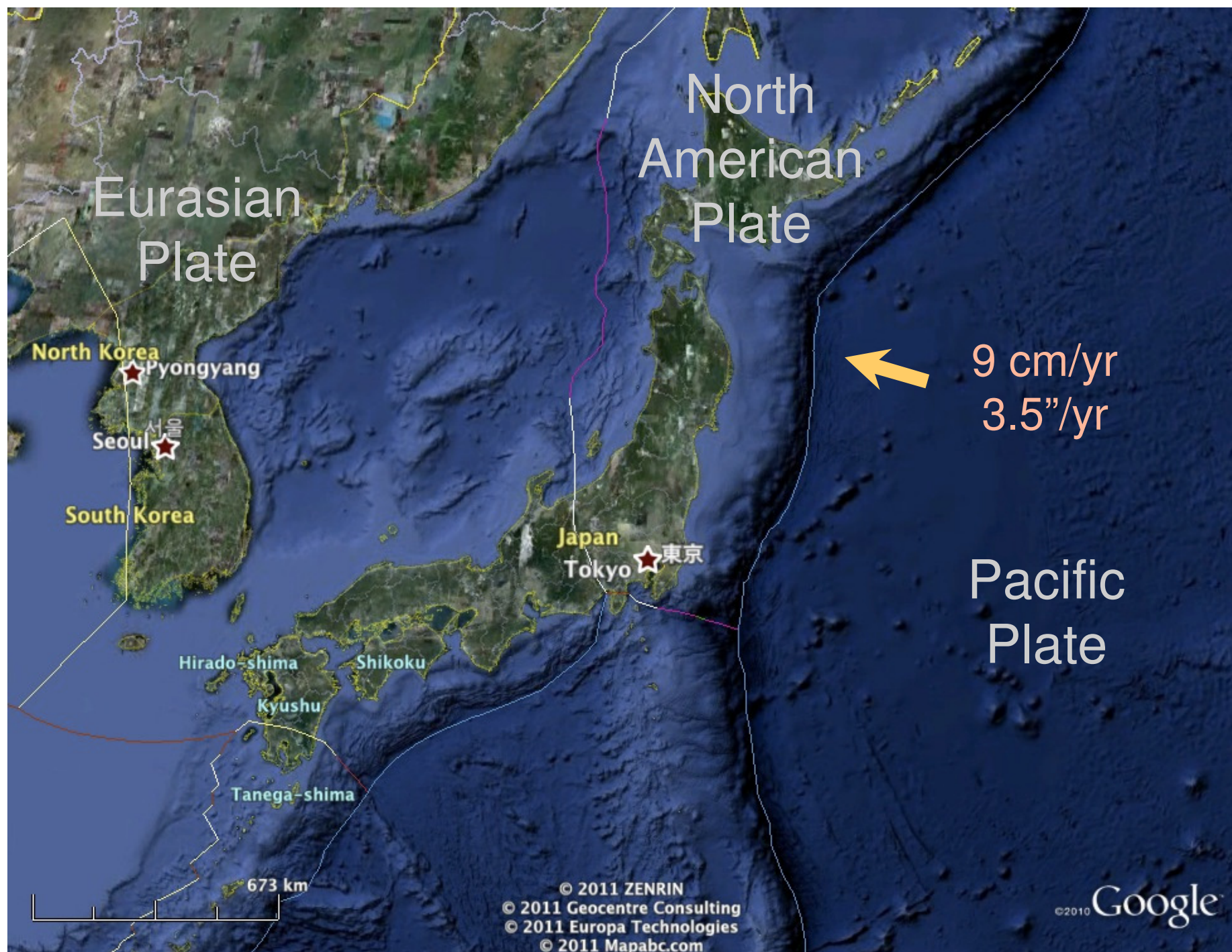
Associate Professor of History (Japanese History)
College of the Liberal Arts

Arthur Motta

Professor of Nuclear Engineering
and Materials Science and Engineering
College of Engineering

Yumiko Watanabe

Research Associate (Geosciences)
College of Earth & Mineral Sciences



Eurasian Plate

North American Plate

9 cm/yr
3.5"/yr

Pacific Plate

North Korea
Pyongyang

Seoul

South Korea

Japan
Tokyo

Hirado-shima

Shikoku

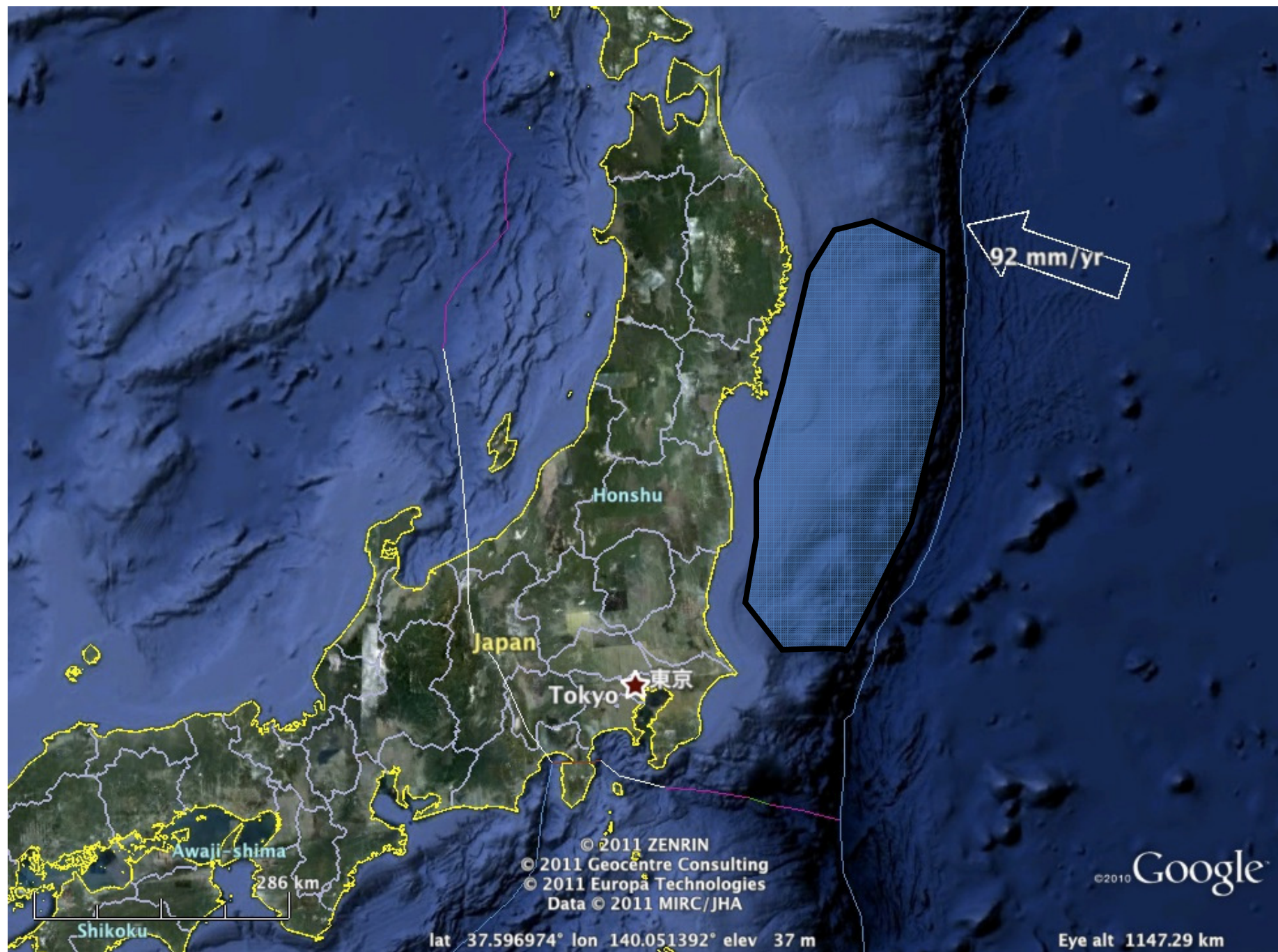
Kyushu

Tanega-shima

673 km

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© 2011 Mapabc.com

©2010 Google



92 mm/yr

© 2011 ZENRIN
© 2011 Geocentre Consulting
© 2011 Europa Technologies
Data © 2011 MIRC/JHA

©2010 Google

Eye alt 1147.29 km

lat 37.596974° lon 140.051392° elev 37 m

286 km

Shikoku

Awaji-shima

Honshu

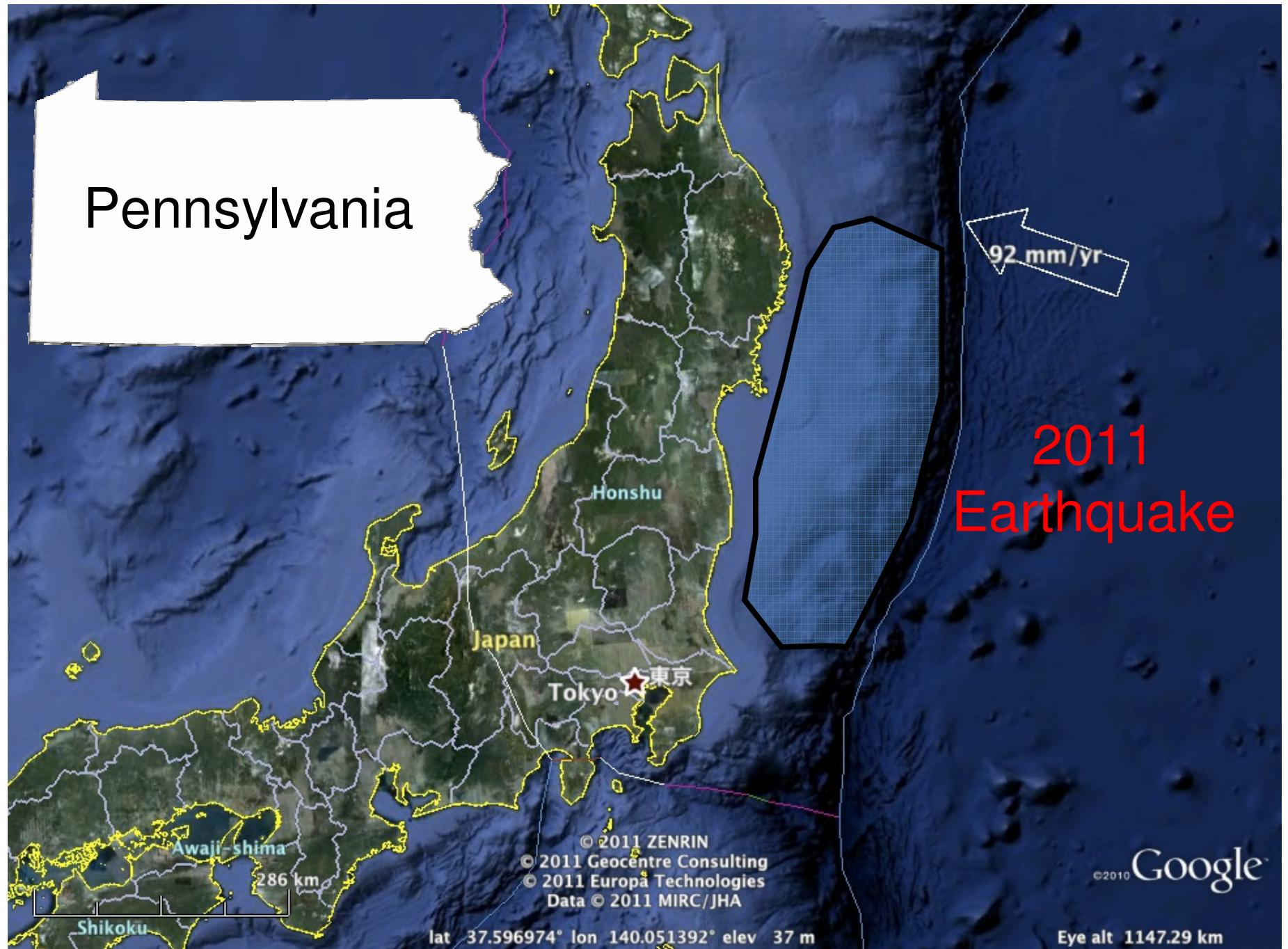
Japan

Tokyo 東京

Pennsylvania

2011
Earthquake

92 mm/yr



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© 2011 Europa Technologies
Data © 2011 MIRC/JHA

©2010 Google

lat 37.596974° lon 140.051392° elev 37 m

Eye alt 1147.29 km

Earthquake Energy

Magnitude	Energy*	Energy*
4	$6 \times 10^{10} \text{J}$	16,000 kWh
5	$2 \times 10^{12} \text{J}$	500,000 kWh
6	$6 \times 10^{13} \text{J}$	16,000,000 kWh
7	$2 \times 10^{15} \text{J}$	500,000,000 kWh
8	$6 \times 10^{16} \text{J}$	16,000,000,000 kWh
9	$2 \times 10^{18} \text{J}$	500,000,000,000 kWh

* Released as seismic waves.

A typical home uses about 1,000 kWh per month or 10,000 kWh per year
 University Park uses about 320,000,000 kWh per year

Earthquake trivia

- The energy released during the quake was about 30 times larger than the design basis
- This is about 2% of the total energy consumed in the US last year
- During the three minutes the earthquake lasted, the island of Honshu moved 24 feet towards the US.
- Tsunami design basis flawed? 1896 quake (7.0) produced a 70+ foot tsunami

Exhibit D

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Department of Mechanical and Nuclear Engineering & Radiation Science and Engineering Center



New Education and Research Initiatives for Nuclear Science and Engineering at Radiation Science and Engineering Center

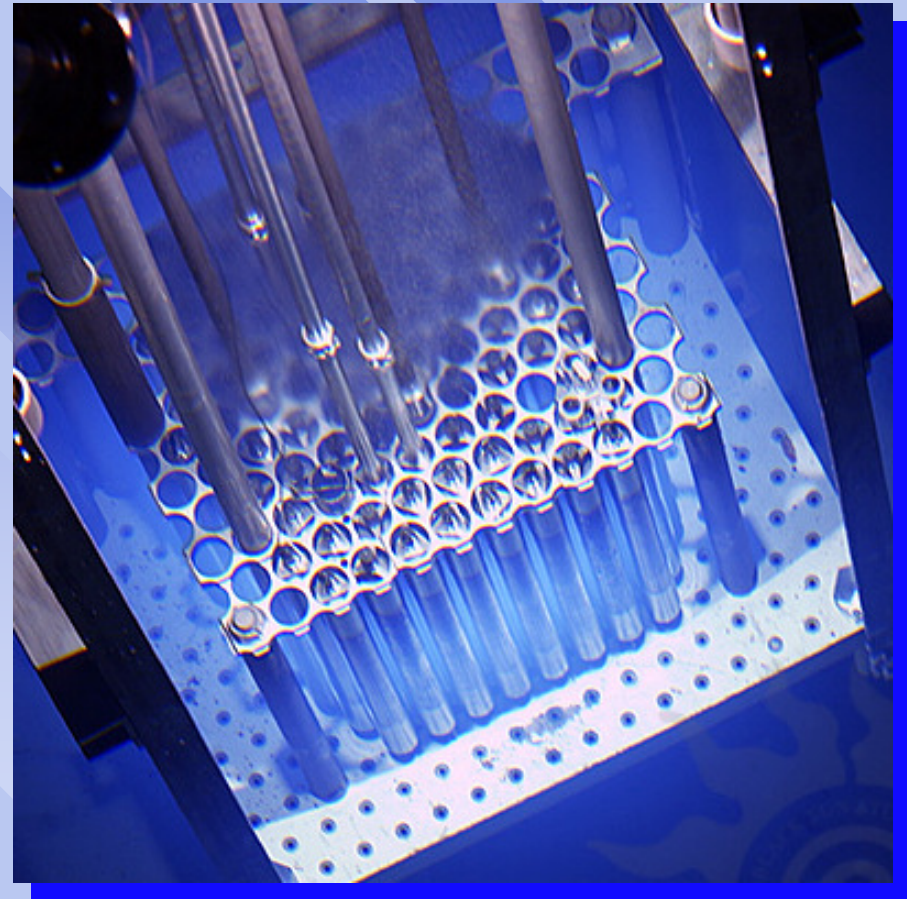
Kenan Ünlü

Director, Radiation Science and Engineering Center
Professor of Nuclear Engineering

**Penn State Nuclear Engineering Society
Annual Meeting
April 16, 2011**

Radiation Science and Engineering Center

- ❖ Breazeale Nuclear Research Reactor
1 MW TRIGA
 3×10^{13} n/cm² sec thermal neutron
flux at core center
- ❖ Gamma Irradiation Facilities
In-Pool irradiators
Gamma Cell 220 Dry Irradiator
(12,000 Curie Co-60, 1.5
MRads/hour)
- ❖ Hot Cells
- ❖ Radiation Detection and Measurement
Labs
- ❖ Neutron Beam Laboratory
- ❖ Radionuclear Applications Laboratory
- ❖ Radiochemistry Laboratory





Interdisciplinary NSE Research Projects

- ❖ Soft Error Rate Measurements
- ❖ Soft Error Analysis Toolset (SEAT)
- ❖ Neutron Intercepting Semiconductor Chip (NISC)
- ❖ Neutron Imaging - Fuel Cell
- ❖ Neutron Beam Characterization (Neutron Chopper)
- ❖ Core-Moderator Assembly and Neutron Beam Port Modeling
- ❖ Cold Neutron Source Design
- ❖ TOF Neutron Depth Profiling
- ❖ NAA-Dendrochemistry
- ❖ Radiochemistry/Nuclear Forensic
- ❖ Nuclear Security Education Program
- ❖ Homeland Security (ARL- DTRA and DHS-DNDO)

Current Teaching Activities at RSEC

- ✓ Nuc E 450 - Radiation Detection and Measurements
- ✓ Nuc E 451 - Reactor Experiments
- ✓ Nuc E 497F - Reactor Operation and Testing
- ✓ Nuc E 002S - Atomic Adventures (Freshman Seminar)
- ✓ Nuc E 401 - Introduction to Nuclear Engineering
- ✓ Training and Requalification Activities (Reactor Staff)
- ✓ OUTREACH ACTIVITIES

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Department of Mechanical and Nuclear Engineering & Radiation Science and Engineering Center



Gamma Spectroscopy Teaching Laboratory





History of Radiochemistry Education at Penn State

- 1960's Radiochemistry Education Program started (new wing added to Radiation Science and Engineering Center)
- 1970's and 1980's very active Radiochemistry Education Program (Prof. W. W. Miller & K. K. S. Pillay)
- 1990's decline interest to Radiochemistry, education activities scaled down, nearly diminished
- Radiochemistry Education Program is restarted in 2008 with DOE-Radiochemistry Education Award Program (REAP) funds and NRC Curriculum Development funds in 2009

Radiochemistry and Related Courses at PSU

- Nuclear and Radiochemistry (Chem 405/NucE 405)
- Radiation Detection and Measurement (NucE 450)
- Radiological Safety (NucE 420)
- Laboratory Experiments in Applied Nuclear and Radiochemistry (NucE XXX, Chem XXX)
- Nuclear Methods in Science (NucE YYY, Chem YYY)

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Department of Mechanical and Nuclear Engineering & Radiation Science and Engineering Center



New Radiochemistry Teaching Laboratory





Nuclear Security Education Program at DOE NNSA Global Threat Reduction Initiative (GTRI)

- Trained and qualified nuclear and radiation security experts decreased
- In December 2008, a bipartisan commission outlined a series of recommendations to the President
- The need for nuclear expertise in security and safeguards has been declared a vital need in the "National Security Professional Development Implementation Plan"
- The commission declares that " The President should establish government wide professional education and training program for the national security on combating terrorism and WMD proliferation"
- Nuclear Security promoted by NAE Grand Challenges



DOE-NNSA GTRI Nuclear Security Education Program

- ❖ DOE-NNSA Global Threat Reduction Initiative (GTRI) selected PSU (K. Ünlü), MIT (R. Lanza), and TAMU (W. Charlton) to build a MSc degree program with nuclear security curriculum (including nuclear forensics and radiochemistry modules) within the existing nuclear engineering programs

- ❖ Selection Criteria includes:
 - Operating Nuclear Research Reactors (1 MW or above)
 - Participated Voluntary Security Enhancement
 - Located near USA Tier 1 and Tier 2 locations
 - Top Ten Ranking in Nuclear Engineering
 - Interdisciplinary offerings of programs
 - Close ties to domestic/international nuclear/radiological entities



Nuclear Security Education Program PSU-MIT-TAMU Partnership with GTRI

- ❖ Each university will develop two graduate courses and some modules. The course materials will be shared among the three universities
- ❖ DOE-NNSA plans to share the course materials, textbooks etc. developed by PSU, MIT and TAMU with the IAEA for worldwide distribution
- ❖ DOE-NNSA will fund all curriculum development costs, course materials, faculty time, and infrastructure developments



Nuclear Security Education Program

PSU-MIT-TAMU Courses



- ❖ Nuclear Security - Threat Analysis and Assessment
- ❖ Nuclear Security - Detector and Source Technologies
- ❖ Nuclear Security - Applications of Detectors/ Sensors/ Sources for Radiation Detection and Measurements
- ❖ Nuclear Security - Global Nuclear Security Policies
- ❖ Nuclear Security - Design and Analysis of Security Systems for Nuclear Reactors and Fuel Cycle Facilities
- ❖ Nuclear Security - Course Modules



Nuclear Security Education Program

PSU-MIT-TAMU Course Modules



- ✓ Civilian/Military Fuel Cycles
- ✓ Fuel Chemistry
- ✓ Separation Chemistry - Actinide/Lanthanide Properties, Waste Management
- ✓ Forensic Science Fundamentals
- ✓ Introduction to Nuclear Forensics and Attributions
- ✓ Physical Protection Systems and Technologies
- ✓ Radiation Safety and Protection
- ✓ Risk Assessment of Nuclear Security Measures
- ✓ Vulnerability Assessment of Physical Security Systems for Nuclear Installations
- ✓ Nuclear Materials in Transit (Transportation Security)
- ✓ Security Fundamentals
- ✓ Protection Against Sabotage



A Consortium for Mo-99 Production with Low Enriched Uranium (LEU) Target

- A consortium with General Atomics (GA) and six universities are formed
- GA is the inventor and builder of TRIGA (Training Research and Isotope Production General Atomics) reactors
- GA is the main investor and industrial partner of the consortium
- University partners are:
 - Penn State, Wisconsin
 - Oregon State, Washington State
 - UC-Davis, and Texas A&M
- Initial funds to start the production by December 2013 is \$50M (DOE-NNSA (GTRI) contributes \$25M and GA contributes \$25M)



Radioisotope Production at RSEC (⁴¹Ar, ²⁴Na, ⁵⁶Mn, ⁸²Br, ⁶⁴Cu and ⁶⁷Cu)

- The Committee on the State of the Science of Nuclear Medicine issued a finding that in 2007, there is *"no domestic source for most of the medical radionuclides used in day-to-day nuclear medicine practice."*
- The Society of Nuclear Medicine and the National Cancer Institute listed ⁶⁴Cu and ⁶⁷Cu as two of the 14 key isotopes in short supply
- ⁶⁴Cu and ⁶⁷Cu is used for diagnosing several illnesses and radio-immunotherapy
- The RSEC can alleviate this shortage by producing some of the needed research isotopes
- Improving production procedures for industrial radioisotope (⁴¹Ar, ²⁴Na, ⁵⁶Mn and ⁸²Br) and investigating medical radioisotope (⁶⁴Cu and ⁶⁷Cu) project is funded by DOE-Office of Science (\$450K/two years)



Radiation Science and Engineering Center Neutron Beam Laboratory Addition

- ❖ Due to inherent design issue further utilization of neutron beam facilities are limited at RSEC
- ❖ New core-moderator assembly needs to be design and neutron beam experimental area needs to be expanded
- ❖ A proposal will be submitted to "NIST Construction Grant Program" to add: 7,700 sq ft new and 13,000 sq ft of expanded laboratory space for graduate research
 - new core-moderator assembly
 - cold neutron source for cutting-edge neutron beam research
- ❖ Total project cost: \$9.0M (\$4.5M match is provided by PSU)



Department of Mechanical and Nuclear Engineering & Radiation Science and Engineering Center



RSEC Expansion



Security Enhancement at RSEC





Summary of New Initiatives (K. Ünlü)

Projects	Sponsors	Status	Funds
Radiochemistry Education Program	DOE-REAP	✓ + +	\$0.65 M
Radiochemistry Curriculum Development	US-NRC	✓ + -	\$0.185 M
Nuclear Forensic Fellowship Program (2)	DHS-DOE-DOD	✓ + +	\$0.50 M
Nuclear Security Education Program	DOE-NNSA-GTRI	✓ + -	\$3.2 M
Radioisotope Production Research	DOE-OS	✓ + +	\$0.45 M
Mo-99 Production Consortium	DOE-GA	✓ + ?	\$50.0 M
RSEC Expansion Project	NIST	✓	\$9.0 M
RSEC Security Upgrades	DOE-NNSA-GTRI	✓ + +	\$2.1 M
NSE Infrastructure Improvements	DOE-NEUP	✓ + +	\$0.25 M
New TRIGA Fuel	DOE-NE	✓ + +	\$1.28 M
RSEC Facility Upgrades	PSU-OPP	✓ + +	\$4.0 M
In-Core Testing of Transducers	DOE-Bettis	✓	\$2.2 M

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Department of Mechanical and Nuclear Engineering & Radiation Science and Engineering Center



?

Thank you

Exhibit E

**The Penn State Engineering Alumni Society (PSEAS)
Conference Call
Wednesday, April 6, 2011
12:00 p.m.**

Those attending were: Frank Arieta, Gary Butler, Jane Clampitt, Grant Crampton, Mike Erdman, John Hollenbach, Bob Jepsen, Ron Lombard, Trish Long, John Mikita, Jim Stavely, Jennifer Theiss, and Stefanie Tomlinson.

John Mikita called the meeting to order at 12:02 p.m.

President's Remarks (J. Mikita)

Board members should build off the ideas that were presented during the brainstorming session at the February Board meeting. The ideas will be sent to Board members, who are asked to rank their top three ideas. Comments and any other new ideas are welcome; the goal is to formulate a plan for new activities for involvement.

Board Membership/Diversity (J. Theiss)

New member recruitment is a top priority and she has been working with development staff and department heads for suggestions. She will be looking to add alumni to the board from departments not currently represented and also to add two or three women. If Board members have suggestions, please send the contact information to her.

PSEAS Faculty/Staff Awards (T. Long)

The College hosted a wonderful awards ceremony last Friday in the Kunkle Lounge. D. Hoffman and M. Erdman attended and were recognized as PSEAS members. She received a few suggestions for next year's nomination and ranking process. This was the first year everything was handled electronically and it worked well. This event has been held since the 1960s and is probably the oldest event sponsored by PSEAS.

Committee Reports

- New Events/Programs (J. Hollenbach) – Bobby Braun, chief technologist at NASA, will speak at the Johns Hopkins Applied Physics Lab in Laurel, MD, on May 25. A reception will start at 6:30 p.m. and the lecture will start at 7:45 p.m. J. Theiss added that alumnus Ned Brokloff has been helping with all details. She sent invitations yesterday to alumni in the Baltimore/DC area. J. Mikita said this is an excellent example of partnering with the Alumni Association. G. Crampton said he posted the event on Boeing's internal network and he will follow-up with Boeing employees in Philadelphia and DC.
- Marketing/Communications (J. Theiss) – G. Crampton drafted a template for a PSEAS annual report. G. Crampton explained that it's a one-page summary of the Board's accomplishments that are quantifiable, such as how many events were held,

the number of students engaged, etc. We can use the report to measure our success from year-to-year.

- Engineering Blue & White Society (J. Theiss) – She met yesterday with Dale Hoffman and Janet Campolongo, president of the Centre County Chapter of the Alumni Association, to discuss ways to engage Blue & White students. M. Erdman added that he attended the recent buffet dinner/mixer that the Blue & White Society considers their annual formal event; students and alumni mingled via a Tic-Tac-Toe game that involved attendees exchanging information.
- APG Resource Committee (M. Erdman) – J. Theiss met with Raj Acharya, department head of Computer Science and Engineering, and he is moving forward with starting an APG. The department has a dedicated staff member to work with the APG, and they have identified six alumni to ask to be part of the initial leadership group. Raj said alumni mentoring will be their first priority. Senior Sendoff will be held April 28th at the Hintz Alumni Center. Students will be able to sign up for an APG and he and J. Theiss will have a table with giveaways, APG info, and PSEAS info to share. J. Stavely may also attend. J. Theiss will send information about the Alumni Association's Alumni Leadership Conference in June. J. Theiss and M. Erdman will work on an agenda for an Engineering APG Leadership Retreat to be held the same day as the June Board meeting.
- IP Mentoring Panel (J. Theiss) – We are moving forward with the program; the concerns that the College's administration had were satisfactorily resolved. Invitations from the Dean will be sent to 45 alumni this week. PSEAS will continue to sponsor a fall IP Seminar, and this year's Seminar will be held October 25. A track specifically for faculty, as well as a faculty-only luncheon, will be added. Dean Atchley asked her to help form an IP Advisory Board, which will consist of 10-12 hand-picked senior level alumni to come back after the seminar. Alumni will also be invited to speak to new engineering faculty members about IP matters as part of their orientation program. J. Mikita said now that this program is moving forward again, it should be publicized as a PSEAS sponsored event for marketing purposes.

APG Updates

- PSIMES (G. Butler) – Their annual faculty appreciation/award dinner was held this past month. The APG was going to try to hold meetings during the week rather than on weekends, but they found it difficult to schedule since only two of the APG alumni are retired and many are scattered across the country. M. Erdman noted that many alumni view coming for a meeting as a recruitment opportunity and can get reimbursed by their

company for travel expenses. Retired alumni can claim travel expenses as a donation to the University.

- PSMES (B. Jepsen) – Officer elections conclude next week. Two areas of struggle for the APG: getting students and alumni to connect (difficulty scheduling an ASME/alumni tailgate during Blue/White weekend) and networking (LinkedIn is not working how they hoped it would). Two alumni have donated money to a student activities fund, and the APG is hoping to get more alumni to donate.
- PSNES (J. Stavely) – Their next meeting is April 16. They are refreshing their priorities to include more alumni outreach and helping the department.
- ASAE – no report
- SPSEE (J. Theiss) – They are meeting today and holding elections.
- ESM AAB (M. Erdman) – They are working on the next issue of *Connections*. Their meeting later this month will include elections. They hosted their third annual Industry Evening the night before the Spring Career Fair, and it was a great opportunity for students to meet one-on-one with recruiters. Their Blue/White tailgate was canceled due to miscommunication between students and alumni; their fall tailgates are better attended. More mentors have been added to their mentoring program.

General Discussion

J. Hollenbach congratulated Jane Harris and the ASME team for taking second place at the national Rube Goldberg Machine Contest. J. Theiss reported the following for next year's Penn State competition: it will be held Saturday, February 11, at the Penn Stater; the task is to blow up a balloon and pop it; board members should think about whether or not we will invite other University student groups to compete; SES students offered to make a hands-on machine for the younger children to play with during the contest. M. Erdman said Karen Sweeney did a wonderful job as this year's emcee. J. Hollenbach said he can get another \$2K donation from ExxonMobil. B. Jepsen will work with Jane Harris and the ASME student and send the letter to John. We can send the same letter as last year; Jane Harris has a copy. J. Theiss noted that Lockheed Martin and G. Crampton also contributed last year. J. Hollenbach suggested it's not unreasonable to seek more funding for next year.

J. Theiss said she will announce 2012 Board meeting dates at the June meeting.

J. Theiss reported that the Director of Alumni Relations from the College of Engineering at the University of Alabama contacted her wanting to benchmark about our alumni mentoring program. She sent the woman some information, including a link to the PSMES site.

The next conference call will be Wednesday, May 4, at noon.

The call ended at 12:48 p.m.