

**TO THE MEMBERS OF THE ACADEMIC COUNCIL  
FORTY-SECOND SENATE REPORT No. 7**

**Summary of Actions Taken by the Senate**  
February 18, 2010

At its meeting on Thursday, February 18, 2010, the Forty-second Senate of the Academic Council heard reports.

Rex L. Jamison, MD  
Academic Secretary to the University  
Professor of Medicine, Emeritus

Summary of February 18, 2010 minutes is located at  
[http://facultysenate.stanford.edu/2009\\_2010/minutes/2\\_18\\_10\\_summary.pdf](http://facultysenate.stanford.edu/2009_2010/minutes/2_18_10_summary.pdf)

**MINUTES OF THE FORTY-SECOND SENATE  
OF THE ACADEMIC COUNCIL  
February 18, 2010**

**I. Call to Order**

Chair Andrea Goldsmith called the third Winter quarter Senate meeting to order at 3:20 PM. There were 35 voting members and 11 *ex officio* members in attendance.

**II. Approval of Minutes – (SenD#6283)**

The Academic Secretary had one correction to the minutes. The correct graph, entitled, “Graduate data, Q” was inserted in place of the graph, which was a duplicate of the preceding graph.

The minutes of February 4, 2010 were approved.

**III. Standing Reports**

**A. Steering Committee (StC)**

Upcoming Senate agenda:

**March 4<sup>th</sup>, the final Winter quarter meeting**, the former Dean of Research and current Special Assistant to the President for federal policy issues, Professor Arthur Bienenstock, will present a report on federal science policy. The second report will be from Professors emeriti William Perry and David Kennedy who will speak on the issue of Reserve Officers Training Corps (ROTC).

**April 15<sup>th</sup>, the first meeting in Spring Quarter**, Pat Jones, Vice Provost for Faculty Development and Diversity, will report on Faculty Gains and Losses and Status of Women Faculty. Shelley Correll will report the findings of the survey on Faculty Equity and Quality of Life. Professors James Campbell and Senator Harry Elam, Co-Chairs of the Study of Undergraduate Education at Stanford, will present a status report.

**April 29<sup>th</sup>**, will have a report from Patricia Gumport, Vice Provost for Graduate Education and a report from the Committee on Libraries on “book storage” plans for the future. There will also be a report on faculty retirement plans.

**C. Committee on Committees (CoC)**

There was no report from the CoC.

**D. President**

President John Hennessy had no comment and there were no questions.

## **Provost**

Provost John Etchemendy had two announcements. He was pleased to announce the election to the National Academy of Engineering of Hau L. Lee, Thomas Professor in the Graduate School of Business, and David A. B. Miller, W. M. Keck Foundation Professor of Electrical Engineering.

[ Applause ]

The Provost announced a new healthcare plan for students. The key provision is an enrollment restriction designed to keep the number of participants stable. There will be one open enrollment opportunity for each student. After that participants will be able to alter the plan only in the case of a major life change, such as the birth of a child.

The announcement led to a series of questions about details of the plan, among them--  
What if the student's spouse loses his or her insurance?

What happens if a student has been covered through the parent's health plan and then is no longer covered after reaching a certain age?

Neither the Provost nor others were sure of the answers.

Vice Provost for Student Affairs Greg Boardman called attention to the student health care web site [[http://vaden.stanford.edu/insurance/2010\\_overview.html](http://vaden.stanford.edu/insurance/2010_overview.html)] where, the Provost has informed us, the answers may be found.

Professor Fire thought it would be important to provide not only a clear explanation of the new plan to incoming students but the reasons for it.

## **IV. Other Reports**

### **A. Stanford Institutes Panel Discussion**

Chair Goldsmith introduced the topic that comprised the entire Senate meeting--the Stanford Independent Institutes. She said, "I believe these institutes constitute two of Stanford's most appealing aspects. It's the breadth and depth of the interdisciplinary research that's done here and the entrepreneurial spirit of faculty with like-minded vision and research ideas getting together to create an institute around those ideas. The purpose of this discussion is to give senators a better idea of how these entities operate, discuss their various missions and oversight, review their overall impact on the university, and provide a forum for discussion and questions."

She added, "There are many institutes within the School of Medicine, but they're slightly different than the institutes within the broader university. They are not represented in the panel discussion today."

In order, the speakers were:

Ann Arvin, the Lucile Salter Packard Professor of Pediatrics and Microbiology and Immunology, and Dean of Research, to whom the Institute Directors report.

Coit Blacker, Ken Oliver and Angela Nomellini Professor of International Studies, and Director of the Freeman Spogli International Studies Institute.

Jeffrey Koseff, William Alden Campbell and Martha Campbell Professor in Civil and Environmental Engineering, and Perry L. McCarty Director of the Woods Institute for the Environment.

Lynn [Franklin] Orr, Keleen and Carlton Beal Professor in Petroleum Engineering, Department of Energy Resources Engineering, and Director of the Precourt Institute for Energy.

William Newsome, Professor of Neurobiology, and Director of the BioX NeuroVentures.

John Shoven, Director of the Stanford Institute for Economic Policy Research (SIEPR), was unable to attend but two guests from SIEPR were in attendance: Deborah Carvalho, administrative director of SIEPR, and Gopi Shah Goda, the post-doctoral fellowship coordinator.

All Directors and Co-directors of the Independent Institutes who report to the Dean of Research were invited to hear today's presentations. Many were in attendance.

Copies of the panelists' presentations and their responses to a brief information questionnaire were distributed at the meeting.

Each presenter showed slides. The slides can be viewed by going to this web site: [http://www.stanford.edu/dept/DoR/labs\\_senate.html](http://www.stanford.edu/dept/DoR/labs_senate.html).

#### Overview--Dean of Research Ann Arvin

Dean Arvin began by introducing Sara Bible, Senior Associate Dean for Research, Administration and Finance, Olav Solgaard, Director of Ginzton Laboratory (and Senator), Aron Rodrigue, Director of the Stanford Humanities Center and Anthony P. Meier Family Professor in the Humanities, and Iris Litt, Marron and Mary Elizabeth Kendrick Professor in Pediatrics, Emerita, and Director of the Center for Advanced Study in the Behavioral Sciences.

“These independent labs institutes and centers represent a group that is different from the many important and very functional centers that exist *within* the Schools and departments. They were established at Stanford by the Senate in 1982, with the definition, ‘Formally-organized research or scholarly programs involving faculty from more than one School.’

“They are specifically structured with tenured faculty as a director. That is a key element of the success of these centers. We note also that these laboratories, institutes, and centers are not designated to function directly as sources of courses for students. Courses are only those cross-listed with regular academic departments when they have a course. On the other hand, there’s an enormous amount of educational activity that goes on in these centers.

There are faculty billets for what are called Senior Fellows in designated policy institutes.

In the next slide Dean Arvin had arranged 17 independent labs, institutes, and centers under thematic headings: “Understanding the Human Condition,” “Protecting Our Environment: “Exploring Fundamental Science” (including 3 institutes set up to interact with SLAC) and “Improving Human Health”.

“The criteria for establishment are spelled out in our policy.

- Advantages to these programs that would have not been encompassed within an existing unit.
- Likely long term active participation by faculty and students
- Positive impact on the faculty’s home departments
- Potential for attracting external support
- Expertise and resources to become a top center in the country.

“Evaluation is an important point that’s made in the Research Policy Handbook about these institutes. Each of the independent labs is required to provide an annual report and budgets to us as cognizant dean. While we haven’t done a lot of formal reexamination, we do have a very active process for evaluating these programs as we go along.”

The Policy Institutes have to be designated as such and approved to appoint Senior and Center Fellows by the provost. Current policy institutes are the Stanford Institute for Economic Policy Research (SIEPR), the Freeman-Spogli Institute for International Studies, the Woods Institute for the Environment and the Precourt Institute for Energy. They are allowed to appoint Senior Fellows who are members of the professoriate and the Academic Council. If these individuals don’t have a primary appointment, they are reviewed by the Advisory Board as if they are professor appointments.

“Since the focus of these institutes is policy, it is not expected that the Fellow’s curriculum vita (CV) would be a typical academic CV. We want to make a place for people who have diverse experience and not with strictly a faculty assistant professor on up kind of background. These individuals are reviewed for joint appointments as if they were secondary departmental appointments, fixed or continuing term.

“There’s also a category of Center Fellows. They may be either Academic Council members or non-Academic Council appointments. The latter are those who are

appointed based on programmatic need. The leadership of the institute is empowered to evaluate and recommend these people for appointments, usually based on their particular expertise as well as the qualifications of the candidate. These are fixed-term appointments. They're reviewed by a standing committee at this point in time, and by us as cognizant dean, and by the provost."

The next slide was a bar graph illustrating the 2008/2009 budgets of 16 labs, institutes and centers. They ranged from less than \$1 million to over \$25 million for a total of \$134 million. Only 6% came from the university's General Funds, the rest was from external sources, like sponsored research and gifts.

"Are these institutes doing what they're meant to do--enhancing interactions among faculty? We are lucky that Dan McFarland, Associate Professor, and his colleagues in the School of Education, have been working on this project [to answer this question quantitatively]". A slide showed a web of connections as lines between nodes with each node a faculty member and the connections with another faculty member representing an interaction--either a shared grant, a shared student, being on dissertation for someone else's student or a co-author with that other faculty member. Comparing BioX 2005-07 with BioX 1995-97 there was a much denser web, indicating many more connections.

"The other question is--what is going on in terms of impact on the departments? And they've [McFarland et al.] been looking at Radiology and Biological Sciences [now called Biology] as two departments that might be influenced by the BioX as sort of a center of gravity." The slide showed a similar representation for the two departments between the two periods of time. There was a hole in the center of the web of connections for Biological Science in the period 2005-2007.

Dean Arvin smiled and said, "Bob [Senator and Professor of Biology] will explain."

[ Laughter ]

Professor Simoni, clarified Dean Arvin's comment, "She means *I* will explain, not *Bob* is the explanation."

[ Laughter ]

Dean Arvin: "Correct."

Dean Arvin commented on the laboratories dedicated to physical sciences and engineering and interdisciplinary work: The Hansen Experimental Physics Laboratory (HEPL), Ginzton Lab, Geballe Lab, Kavli Institute for Particle Astrophysics and Cosmology (KIPAC), Stanford Institute for Materials and Energy Sciences (SIMES), and Photon Ultrafast Laser Science and Engineering (PULSE). The last three are the SLAC-connected independent labs. The independent labs in this grouping have tended

to be the home of what's referred to as "big science". HEPL was founded in 1947 as Stanford's first Independent Laboratory.

"To sum up, unique opportunities for interdisciplinary research exist at Stanford: The location of our seven schools on one campus; our faculty who are so entrepreneurial in seeking research collaborations; and our students who drive research across disciplinary boundaries. But the bottom line is the independent labs, institutes, and centers. [They form] an unusual structure, not common in our peer institutions but beginning to be imitated. [They have increased] our flexibility, our ability to be ready to get engaged with interdisciplinary research. Many funding agencies are very interested in going in this direction. As a result of this history, we have been pretty well poised to take advantage of those opportunities.

"This is not to say that there aren't complications from having a set of institutes that are not located within a particular school. It's necessary for us to collaborate very closely, both our office and the directors, with the school deans and the department chairs. As long as we keep that in mind, we have something that works well. And I think you'll hear that as you hear the presentations to follow."

[ Applause ]

Freeman Spogli International Studies Institute (FSI)--Coit Blacker, Director  
Director Blacker began by showing a slide of the Mission Statement.

"We exist to encourage, to promote, and to support faculty-led research on the most challenging and complex international policy issues that we confront. The key part is all of the research is that it is faculty-led.

"We were established in 1987, following the submission of the Ward report. Bob Ward chaired a faculty committee appointed by [President] Don Kennedy to determine what more Stanford should be doing in international studies. The choices were--keep things as they are, come up with a plan to raise \$250 million for a school of public and international affairs, or [create] something in between. We got something in between, which is the policy institute model.

"We are made up currently of four centers and five programs."

The centers are:

- Center on Democracy, Development, and the Rule of Law
- Center for Health Policy
- Center for International Security and Cooperation
- Shorenstein Asia-Pacific Research Center

The programs are:

- Forum on Contemporary Europe
- Program of Food Security and the Environment

- Program on Energy and Sustainable Development
- Inter-University Center for Advanced Japanese Studies
- Stanford Program on International and Cross-Cultural Education

“We are likely to have two more centers by this time next year. The Forum on Contemporary Europe will be replaced by the Europe Center, which is a joint undertaking between FSI and the School of Humanities & Sciences.

“We also have oversight responsibility for the Stanford Center at Peking University. We hope to break ground on that sometime in the next month.

“We have two educational programs, the Inter-University Center for Advanced Japanese Studies, in Yokohama, and the Stanford Program on International and Cross-Cultural Education, which develops curricular units for the K-12 folks based on research coming out of the Institute.”

Director Blacker showed a slide of the FY09 Budget.

“What’s striking is that 85% of what we raise every year comes from a combination of grants and contracts, income from endowment, and gifts. [Only] 4% comes from General Funds. Most striking is that roughly half of what we spend every year goes out in the form of salaries and benefits for faculty, research personnel and administrative personnel.

“Facilitating research is one of the most important things that we do. We build expertise through the recruitment of new faculty. We have added ten faculty since I assumed the directorship in 2003. Most are joint appointments with departments. Most are full time, some are half time, and some are even quarter time.

“We help to create and support faculty collaborations that might not otherwise exist through the provision of space, infrastructure, administrative resources, and seed funding. Over the last four or five years, we’ve generated, with the office of the president, about \$2 million in seed funding.

“[We provide] fund-raising and outreach support, and student funding opportunities.”

The next slide illustrated the organizational time line of the Center on Democracy, Development, and the Rule of Law (CDDRL).

“CDDRL is an example of how a research community comes together at FSI. The key is, in 1999, it actually started as a faculty seminar with about 15 faculty from three schools and six departments. The central question was, ‘If you’re thinking about how to fix broken places around the world -- and there are many of them -- which comes first? Is it good politics or good economics?’ It turns out, the answer is neither. It’s good institutions. We know them when we see them, but we don’t know how to build them. That’s what all of this is about. There’s a large undergraduate lecture course that

started with 20 students and now has 200 students. There's the Draper Hills Summer Fellows on Democracy and Development Program, which brings together 25 to 30 mid-career folks from the most dysfunctional parts of the world to learn about how to make their cultures and systems -- not their cultures -- less dysfunctional."

The next slide was an overview of the faculty. "We have 25 active faculty members, 9 active emeriti, and 35 courtesy appointments drawn from five schools, eight departments, and the Hoover Institution. Within the School of Humanities and Sciences, the departments are Economics, History, Political Science, and Sociology. In the School of Engineering, it's Management, Science & Engineering. In the School of Earth Sciences, it's Environmental and Earth System Science. The Law School billet is open since the retirement of Tom Heller. [Dean of Law] Larry Kramer and I are trying to figure out how to replace the irreplaceable Tom Heller. And we have appointments in two departments, Pediatrics and Medicine, in the medical school."

In his final slide, Director Blacker outlined the several ways in which FSI is involved in education and training.

"We contributed \$3.66 million to graduate education in at Stanford in FY09. We support 40 visiting fellowships, mostly pre- and postdoctoral awards. We have two undergraduate honors programs that operate under the auspices of the Center for International Security and the CDDRL. We have a mentored undergraduate research fund which helps support the work of 16 undergraduates per year. All of our faculty are actively involved in teaching and advising, including freestanding Senior Fellows, who do not have a departmental appointment."

[ Applause ]

Woods Institute for the Environment—Jeff Koseff, Director

Director Koseff began by acknowledging two people, Buzz Thompson [Professor Barton Thompson, Jr.], Co-Director of the Woods Institute, and Pam Matson [Professor and Dean of the School of Earth Sciences]. "Pam is as much responsible for the formation of the Woods Institute as anyone else on campus. She's one of the three leaders of the initiative on the environment and sustainability."

The Woods Institute carries out its mission by:

- 1) Sponsoring interdisciplinary research that's focused on solutions to global environmental and sustainability challenges.
- 2) Infusing science into policies and practices of business, government and non-governmental communities.
- 3) Developing environmental leaders among our faculty as well as our students.
- 4) Serving as a catalyst and a hub for the larger community at Stanford in environmental research, education and action, including making Stanford itself a more sustainable entity.

“We work in five focal areas:

- Energy & Climate Systems
- Freshwater
- Land Use & Conservation
- Oceans & Estuaries
- Sustainable Built Environment.”

The Institute has a spectrum of activities ranging from research to taking those ideas and then putting them into action.

The personnel include Woods Institute Senior Fellowships, currently numbering about 46, from 20 departments among all seven schools. There are 101 affiliated faculty.

Director Koseff turned to the current projects.

“In terms of finding solutions, there are three activities. The first is the Environmental Ventures Projects, geared at providing seed funding for faculty to come together and work on solutions-oriented research in an interdisciplinary sense. One example is, “Reducing Childhood Mortality in Africa”, a joint project between the med school, engineering and the Woods Institute. It’s headed by Jenna Davis [Assistant Professor of Civil and Environmental Engineering and Center Fellow at the Woods Institute.]

There are 33 such projects we have funded since the inception of Woods, [amounting to] \$4.6 million invested in 90 faculty from 25 departments in all seven schools, 124 graduate students, and 150 undergraduates. So the reach is quite deep.”

Director Koseff showed a slide of a bar graph depicting the number of proposals from each school in 2005. Each bar had 3 segments representing submitted, selected and funded proposals. The next slide was a similar bar graph illustrating the number of proposals submitted for the 2010 program, which indicated a sustained interest, and in several schools, an increase in proposals. “In fact, Ralph, [Ralph Horwitz, Senator and Professor and Chair of the Department of Medicine], you’ll be pleased to see we are getting increasing representation from medicine, which I think is really encouraging.

“On a larger scale, one of the things we’re trying to do is infuse science into policy. We need to build collaborations with outside entities and take these ideas and put them into action. When we find ideas that are compelling and large scale and involve multiple faculty and outside partners, we can build these collaborations. One example is ‘The Natural Capital Project’, which is built on the concept of ecosystem services or how do you make conservation pay economically. It’s directed by Gretchen Daily [Bing Professor in Environmental Science and Senior Fellow at the Woods Institute]. It involves a number of faculty at Stanford, and a partnership with The Nature Conservancy and the World Wildlife Fund. [It involves] working at a number of places around the world--China, Tanzania, Hawaii, and California, are some examples.

“A second example is “Food Security and the Environment” which is a joint collaboration with FSI. It is focused on how we are going to feed the population of the world in the 21st century without destroying the environment in the process. As you’ve seen from the last couple of years with food riots in Africa and Asia, food security, global security, and political security are all tied to each other and to the sustainability of the environment.

“The third example is the Center for Ocean Solutions, probably our most ambitious undertaking. This is a partnership with the Monterey Bay Aquarium, an organization that has an unprecedented ability to reach and educate people on issues surrounding the future of the oceans. The Monterey Bay Aquarium Research Institute, MBARI, has the capacity to deploy instruments in the most unbelievable places. With the science capacity of Stanford [we are going to look at] finding sustainable solutions to our ocean challenges. Meg Caldwell [Senior Lecturer, Law School] is the current executive director. We are looking for a science director.

“We also sponsor Uncommon Dialogues. As a neutral party, Stanford can bring people together to talk about issues in a way that many other entities simply cannot do. People or entities or organizations that are rivals or competitors or even adversaries come together around the table and talk about important issues.

“The Biofuels Workshop in December 2006 is an example. We didn’t focus on the science of biofuel production, but rather on the water-energy trade, the environmental implications of biofuels or corn-based ethanol. We had people from automobile companies, food growers, government agencies, and academics, who met and talked for two days about these issues. We came up with five consensus papers regarding the future of biofuels. I’m not saying we were responsible for the decline in interest in corn-based ethanol, but I think a lot of people were influenced heavily by those discussions.”

Educating leaders. “The Aldo Leopold Leadership Program, which was started by Hal Mooney [Harold Mooney, Professor of Environmental Biology and Senior Fellow at the Woods Institute] and Jane Lubchenco [now Under Secretary of Commerce for Oceans and Atmosphere, and Administrator, National Oceanic and Atmospheric Administration NOAA], was designed to teach emerging mid-career environmental scientists skills on how to communicate more effectively with media and with government. Pam Matson spearheaded bringing this program to Stanford. Even though we have a number of Stanford fellows who have gone through this Leopold program, the goal was always to figure out how we could apply [the program] to our own students and faculty.

“One of our programs is the rising environmental leaders network. It consists of 19 Ph.D. students and postdocs from 6 departments across campus. They’ll be together for one year to learn how to build their communications repertoire, solve problems together and explore career options. Hopefully, these people will, through this

exploration, not only become more effective communicators, but also more effective collaborators.

“Another example is the Center for Ocean Solutions, a collaboration among 7 campuses in the Monterey area. The aim is to enhance graduate marine education through courses, special seminar series, and technical training. It’s another way we can enhance the educational experience of our own students as well as those other institutions without having to invest in an enormous number of new faculty. There’s no way that we could have a marine policy degree-awarding program, because we would have to hire too many faculty. But by collaborating with these folks, we can give our students opportunities they wouldn’t get otherwise.”

Director Koseff concluded by showing a slide of the Woods Institute Expenditures for FY08, FY09 and FY10 as a bar graph. “The point here is that we’ve tried as much as possible to make sure that at least 80%, of our expenditures go to research programs and training leaders.”

[ Applause ]

The Precourt Institute for Energy (PIE)—Lynn Orr, Director

“We’ve been reminded in the past few years about how important energy is to human societies. It’s integrated throughout the fabric of modern societies. You can’t imagine running the kind of lives we live without heat and light and transportation and electricity for computers and everything else. But it’s also one of the primary ways we interact with the global systems that we count on for the planet. Climate and the oceans are critical parts of that. Air, clean air, water, freshwater, food, and climate are all linked together and influenced by energy. I think it’s fair to say that we take all these services completely for granted. And it’s time to do much better.

“My colleagues at the Woods Institute are busy working and thinking about the environmental side. The faculty involved with the Precourt Institute are thinking about [the supply side]--how do we supply the energy the planet needs to live productive and comfortable lives and at the same time protect those planetary services that we all depend on? We think that Stanford should be a leader in this effort.”

Director Orr showed a slide summarizing Energy Research and Teaching at Stanford.

“Fortunately, we have lots of assets to bring to the table. [There currently are] 157 faculty in 22 departments and 13 independent labs or programs that involve energy in some way in the research that they do. They are distributed across the university, much in the same way the faculty in the environmental arena that Jeff [Koseff] talked about are distributed around the university.

“...Activity in this area began in the 1970s with the Institute for Energy Studies (IES). Some of us in the room are old enough to remember the energy crises of the 1970s. Then in the middle ‘80s, when energy prices went down and oil prices went down, the

United States--really, the world--forgot about energy as being important, and we shut down IES because we couldn't support it externally. Our job now is not to waste the next 20 years the way we wasted the last 20.

“Our objective is to lead the world of energy research across the spectrum, from the basic science of how we do energy conversions for our use, to the economics and the policy that govern how we distribute and use energy ourselves. That means building a portfolio internally in the university, bringing this incredible intellectual power we have in this university to bear on something that really matters to our future and translating that into improved education for our students as well.”

Director Orr showed a slide listing the Component Goals of the Precourt Institute for Energy (PIE).

- Bring together elements of our wide-ranging energy research effort to work on interdisciplinary research when it makes sense to do so in the energy arenas.
- Make new faculty appointments that fill gaps in energy research and teaching at Stanford.
- Support the strong disciplinary and department level research efforts that make this possible
- Build support for graduate students and postdocs working on energy.
- Make our energy research enterprise more visible externally and work more effectively with companies.

The next slide was an organizational diagram showing five principal programs.

- 1) Precourt Energy Efficiency Center
- 2) Global Climate and Energy Project
- 3) TomKat Center for Sustainable Energy
- 4) Stanford Institute for Materials and Energy Sciences (joint with SLAC)
- 5) Program on Energy and Sustainable Development (FSI)

“The Precourt Energy Efficiency Center, is funded about \$2 million a year. It is aimed on the part we can do right now. We know how to use energy more efficiently but we don't seem to do so. Understanding in the short term why we don't do the things that would be in our economic interest to do can help us think about how we can do better [in the long term].

“The Global Climate Energy Project. We spend on this project at Stanford about \$10 million a year, to support research on ways to convert energy, say, from sunlight to electricity, or from fuel to mechanical work, in a way that reduces greenhouse gas emissions. The project is focused on greenhouse gases and works across the spectrum of primary energy resources. It looks for good science, a pathway for impact on greenhouse gas emissions, and ways to bring new options to the table for providing energy with reduced greenhouse gas emissions.

“We're creating a new TomKat Center for Sustainable Energy focused on what it takes to get to a much bigger fraction of renewables in the energy mix. We have lots of

sunlight, a lot of wind, a big geothermal resource and then other smaller resources. How can we put those to work in a way that reduces our dependence on things like coal and fossil fuels? [The question] is inherently interdisciplinary in the sense that you can have all the wind in the world converted into electricity, but if you don't have a grid that can get it to where it needs to be and markets that allow those renewables to penetrate the grid, then you haven't solved the problem. So each part is dependent on the other.

“On the basic research side, there's the Stanford Institute for Materials and Energy Sciences mentioned by Ann [Dean Arvin] that is one of the dependent institutes. Because the basic science work they do is so important to the idea of energy conversion from some resource to some service that we use, it makes sense for us to have a strong dotted-line relationship with them. The Executive Committee includes the director of that institute.

“The same is true at the other end of the spectrum for the Program on Energy and Sustainable Development, which is in the Freeman Spogli Institute.”

Director Orr reminded the Senate that PIE was “the new kid on the block. We'll have bipartisan five new billets. Some of those will be joint appointments [with Schools and departments] and some not.

“We're expecting about 20 new graduate fellowships and some postdocs as well. We just awarded about \$1.8 million in seed funding research. They're energy-related, looking for the proof-of-concept experiment or analysis that equips somebody then to raise much more money from federal sources or other sources.”

The last slide was, “Opportunities for Impact”.

- Provide useful and efficient coordination for a wide-ranging set of activities
- Make PIE more than the sum of its parts
- Enable research and teaching on interdisciplinary aspects of energy that builds on the strengths across the university
- Find ways to make our effort more visible and broaden the impact of our students and their faculty research groups
- Work effectively with our colleagues engaged in parallel efforts of the Woods Institutes, FSI and SIEPR.

“While our primary job is not to teach, we can help identify where there are gaps in the program and use some of our faculty resources to help fill some of those gaps along the way.”

[ Applause ]

The BioX Institute--William Newsome, Director of the BioX NeuroVentures

“The BioX mission is to foster cutting-edge interdisciplinary research into problems of fundamental importance in the biosciences.

“BioX sponsors a number of activities, ranging from basic research, development of new technologies, translation of discoveries to clinical applications, dissemination of technology and ideas to the larger scientific community at Stanford and around the world, and training future generations of scientists in this interdisciplinary incubator so that they are raised in an environment that does not know our standard boundaries.

“The director of BioX is Carla Shatz [Professor of Biology and Neurobiology], who came from Harvard two and a half years ago. (She had a travel commitment today that couldn’t be changed.) I am going to talk to you about NeuroVentures, a new program in BioX.

“BioX has 445 faculty affiliates in 56 departments across five schools. It’s been an extraordinarily successful enterprise. The backbone that drives research is faculty-initiated interdisciplinary initiative programs [IIPs]. We give about 20 to 25 IIP awards every two to three years to groups of collaborative faculty. We provide 30 to 35 interdisciplinary graduate fellowships but only two postdoc fellowships each year. We provide a number of undergraduate summer research fellowships and graduate students travel awards to go to meetings across boundaries that they might not normally be able to attend. Finally there are core research facilities.

“One of the problems that Carla Shatz faced when she came here was to take this successful enterprise and keep it vigorous and agile and responding to new challenges, thus avoiding the problem of becoming just another silo on campus.

“Carla introduced the concept of BioX Ventures to invent and develop and disseminate new technologies in science. It’s not a core facility and is not intended to be. The idea is to create incentives for faculty who have not been involved in BioX before to engage projects with unusual potential to change the way that science is done. By definition, these will have to be large-scale enterprises that need rapid development and are beyond the scope of any one department, school or discipline. We want to incubate these initiatives under the BioX umbrella and if they are valuable, disseminate them into the community. The product isn’t *venture* capital in the sense of business; it’s *intellectual* capital we’re trying to build.”

BioX NeuroVentures

“I am directing, the first BioX Venture, ‘BioX NeuroVentures’. We want to incentivize novel inventions and collaborations with exceptional promise for unlocking secrets of brain and behavior.

“It was initiated in August 2008, which was very portentous timing, just before the economy crashed! It was endorsed by the President and the Provost and launched with a gift from the Rosenberg Foundation, plus matching University funding.

“Why [was brain and behavior] chosen as the first thing? In our disciplines, progress typically goes incrementally. But every once in a while, driven by new technologies or new theoretical insights or new opportunities, a discipline undergoes a nonlinear quantum leap in its potential or accomplishment. Many of us think that [applies to] neuroscience and the study of the human brain, broadly speaking. There’s a big wave coming right now. There are lots and lots of waves. But occasionally there are waves that have the potential to change the entire landscape. And it’s coming now in the study of the brain. And the question is, will we catch it at Stanford?”

“What is this wave? The study of the human brain...is the grand scientific challenge offered in the 21st century. (I don’t think it’s necessarily the most important. Probably it ought to take a back seat to the sustainability of our culture as the most important problem. But it is certainly not too far behind.) It will tell us a lot about what it really means to be human. Where does thought come from? Where do our emotions come from? Where does creativity come from? How do these things influence the decisions we make? Not only will it give us insight into our normal selves, it will give us insight into diseases, such as depression, and translate, I think, into important clinical discoveries.

“[The study of the brain] going to affect every aspect of academic endeavor. Hank Greely [Professor of Law] and I are already members of a national group on neuroscience and the law. Neuroscience evidence is being brought more and more into courtrooms. Judges are perplexed and want guidance about neuroscience. We now have a faculty member in the Graduate School of Business who is in neuroscience. He looks at how the brain responds to various marketing strategies.

“This will be important for the School of Education as we learn about individual brains and how they learn.

Scientific content of NeuroVentures. “The brain is the most complex entity known in the universe. We all have  $10^{12}$  (ten trillion) neurons inside our heads, and each of those neurons has ten to 15 connections with other neurons. It is remarkably complex and a poor neurophysiologist like myself cannot understand it. I have to get input from engineers, like Andrea [Chair Goldsmith], who knows about signal processing and how you decode signals among populations of neurons and how you handle noise.

“The brain is, a nonlinear dynamic system. I don’t have the mathematical ability to study nonlinear dynamic systems. But physicists and applied mathematicians at Stanford do. And Andrea assures me that electrical engineers do, too. We’ve got to have those people on board.

“The brain does not have an architecture like our normal digital computers. It operates by totally different principles and yet it computes things remarkably well. What are the algorithms? We’ve got to have computer science people involved [to answer that question].

“Psychologists are essential. If we want to study attention, memory, or decision-making, the people in psychology have a century of expertise in studying these things quantitatively.

“Neuroscientists like myself are important. And molecular biologists are giving us new genetic tools that allow us to dissect the brain in ways that were not even imaginable five years ago. Many tools have been invented right here.

“That gives you, I hope, a sense that the key to understanding the brain is to involve this kind of broad community. Stanford has huge competitive advantages. We have superb strength in all the relevant disciplines. They’re all within 150 meters of each other.

“Stanford has been a magnet for exceptionally creative neuroscientists during the past decade. I would not trade our young neuroscience faculty for that of any university in the world. By neuroscience, I mean [it in a broad sense]--all the way from psychology through engineering. Some of the key technologies that are changing the face of neuroscience were invented here at Stanford. There are no boundaries here. Ideas travel fast. We have the BioX model to build on.

“BioX NeuroVentures aims to be a catalyst. Leadership in the science of the brain, with its immense implications for human understanding, is going to be a standard in this century by which great universities will be judged. Our aim is to be a catalyst and pull the intellectual strength of this community together to solve the fundamental problems about the brain.”

[ Applause ]

#### Question and Answer Period

Chair Goldsmith invited all the speakers to form a panel in front of the Senate for questions from the Senators.

Professor Kenneth Scott asked, “What share of these expenditures and the resources is devoted to measurement of what they have accomplished?”

Director Koseff replied by noting that the usual academic metrics of success don’t apply to the institutes. “Departments might measure their success by the number of student units they teach or the number of graduates students they graduate or the research dollars they receive. We’re trying to look at what the actual impact of the work is. In the short term, it’s about building new collaborations and getting people engaged. In the longer term, it’s about policies or actions that occur as a result. And in the still longer term, it’s about how people’s lives have changed for the better as a result of these things.

“I don’t know if anybody has a compelling or cohesive way of [measuring] it. If you have some ideas, we are more than happy to talk to you.”

Professor Scott observed, “You span a huge range of activities and objectives and goals. My question is simply, of the total 100% capacity and resources you have, how much is devoted to measurement [of accomplishments]?”

Director Koseff said in overall terms he thought it would be only a few percent.

Director Newsome commented, “In BioX, there are two metrics I place some faith in. One is the study [described by Dean Arvin] from the School of Education on whether BioX fosters connectivity among faculty. The study provided data that it does increase connectivity among faculty.

“The other piece of data is the IIPs that BioX has created. [It invested] about \$5 to \$10 million [in IIPs] that has led to over \$100 million of new externally funded grants. Some of those projects would probably have been [funded] without the IIPs but a large fraction of the IIPs, I’m sure, [were based on] stimulated ideas and collaborations that have led to this amplification [in funding]. We’re not spending a lot of time on self-evaluation. There’s no budget item in BioX for, ‘Metrics of success.’”

Director Orr commented, “In the long term, what really matters is the impact on how people think about these big problems we’re working on. The other big impact is upon the people who flow through these programs--students and faculty. Of course that’s even harder to measure in terms of impact.”

Dean Deborah Stipek had the next question. “I’d like to ask about your experience with centers as a structure and how they connect with more traditional disciplinary-based structures. In a way, what Stanford has done is maintain its discipline-based structure, and laid over that in an orthogonal way these multidisciplinary structures. Have you experienced any tension between the two? If we think forward about the direction universities will take, is there a ‘tipping point’? Is there a point at which one approach to a problem, the multidisciplinary approach, begins to undo the more discipline-based approach? Are we getting close to that tipping point or do we have a long ways to go?”

Director Blacker replied, “I would start with something Lynn Orr said. We cannot have excellence in these institutes unless we have robust strength within the discipline. So it cannot be an either/or. It’s no accident that the quality of the work that goes on at FSI, which I think is quite high, is a function of the really good faculty, really good graduate students, and remarkable undergraduates who keep us honest.

“My own view is we have to come to a recognizable balance between work that must take place within the disciplines and that which can’t take place within one discipline because the problems are so vast. That is the challenge confronting the American

research university. We have the best chance to get it right because we're very self-conscious about trying to get there from here."

Dean Arvin added, "Bill [Newsome's] NeuroVentures is a good example of how we expect these things to occur, be incubated, and then spread out and not be maintained necessarily within one institutes or centers. That is the way in which we leverage these centers. I don't think we're at a tipping point, because we see the vast majority of faculty effort going on in their departments and in their disciplines. I believe it gives us a lot of flexibility and agility to do new things and engage different faculty at different times in these areas as they direct their own research in a particular way."

Director Orr commented, "I think there is a real advantage to being able to take a problem that needs an interdisciplinary focus and then engage folks in economics, the sciences [and others], that are thinking about how the grid might work from a technical standpoint, and draw all of those people [together] in. Trying to reorganize the university into a larger group actually takes away from the benefit of that. I agree with Chip [Blacker] that it's a balance. But I don't see it as something that supplants the university organization."

Professor Horowitz, "First of all, I must say that these presentations were terrific. My congratulations to each of the presenters. I have two somewhat unrelated questions. The first is--how often do these interdisciplinary institutes or programs actually lead to new disciplines, that out of the interdisciplinary collaborations emerge disciplines that reflect a synergy or a creation of something that's really distinctive scientifically or educationally?"

"The second is--how important are physical structures to the success of your institutes --that you have a home where faculty come together? Or can you create those dense neural nodes that you showed among people more widely dispersed?"

Director Koseff responded, " With regard to your first question, it might be a little too early, but I can think of three or four examples where departments have been transformed, resuscitated, revived or invigorated by these interdisciplinary initiatives. A department within the School of Earth Sciences that was called Petroleum Engineering reinvented itself around energy resource engineering. Several faculty in Civil and Environmental Engineering are now making sustainability a clear focus. Material Science and Engineering within the School of Engineering essentially transformed itself from a department that focused on information technology to one that has a huge alternative energy focus. The Department of Bioengineering, of course, sits between two schools.

"With regard to the second point I believe it's critical to have a hub, a coming-together place. The value of Y2E2 [the Jerry Yang and Akiko Yamazaki Environment and Energy Building] in terms of bringing the environmental community together, has been enormous. It will help not only with our environmental community, but in terms

of being part of whole quad and the potential interactions with bioengineering and nanotechnology.”

Director Blacker agreed with Director Koseff and added: “How this stuff works is--the Woods Institute was actually incubated out of FSI. So it’s not about building empires. It’s about trying to put together structures that will actually advance the goals you outline. International Policy Studies is not a discipline. It’s a set of tools. But there is a certain way we train our students that have to do with the evolution of the study of international systems, which goes beyond the boundaries of political science.”

Director Newsome commented, “My field is a good example. I’m a neuroscientist or neurobiologist. Before 1963, there was no field called neuroscience. There were people interested in the nervous system in departments of anatomy, physiology, pharmacology, psychiatry and neurology. But there wasn’t a field. The very first one was formed at 1963 at an unnamed institution in Cambridge, Massachusetts. We now have a Society for Neuroscience with 30,000 members that have come into being since the 1960s. Clearly, some of these interdisciplinary efforts ultimately become fields with their own canons, heroes, and culture. As for my field—neuroscience--even though it was an interdisciplinary effort and a novel one in the 1960s, we now realize that the challenge to understanding the brain is far vaster than we ever realized. But we do need a place.”

Professor John Willinsky asked, “Where do the humanities fit in? I’m curious to know whether any of you really have a vision for hooking up with those of us in the humanities.”

Director Newsome replied, “Absolutely. The philosophy of the mind is incredibly important, but work-a-day neuroscientists have certain rules of things they go about doing. They don’t reflect very deeply or critically on the meaning of what they’re doing...we’re sitting here reducing people, their feelings and their cultures, to collections of little neurons. That drive toward reduction is where we can lose the preciousness of the whole person. One thing the humanities can do for my field is to keep that whole person in mind. This is going to be an issue in the legal system as well. Did I do an act because I am a responsible person and I had choice? Or did my neurons make me do it?”

[ Laughter ]

Professor Aron Rodrigue, Director of the Stanford Humanities Center, commented, “As a matter of fact, the Stanford Humanities Center has just convened a discussion group on Mind and Culture, bringing together various faculty members from diverse disciplines in the humanities, psychology, neuroscience, and other sciences. The group will be debating how humanities and sciences related to cognition can inform each other and provide various insights from the disciplines. And, to illustrate the synergies that have developed between institutes over the years, I should mention that we have long collaborated with FSI in bringing to the campus international fellows. Last year

we inaugurated a joint short-term international fellows program. I think the Humanities are in constant dialogue and collaboration with the various Centers and Institutes across campus.”

Director Newsome nodded, “We were just in a meeting together in the Humanities Center last week trying to get a working group formed.”

Director Koseff noted that the Woods Institute had a joint conference with the Humanities Center on environmental myths and metaphor when Professor John Bender was Director. “An outcome of [that conference] was that a faculty member was successfully recruited to Stanford. There were at least five or six things within the Woods Institute he could point to where there are active Humanities faculty participation and leadership.”

Professor Laura Lazzeroni asked how the existence of the Institutes might affect relationships with industry.

Dean Arvin replied, “Several Institutes have industry affiliates programs where it’s appropriate. In the energy institute [PIE], we expect that to be a very important opportunity [for reaching out to industry].”

Professor Lazzeroni followed up, “Do you see it as facilitating relationships with the traditional departmental structure?”

Dean Arvin responded, “I think it does help, because the institutes are in a position to bring together faculty with diverse interests, and they can make good partnering events happen. It’s an opportunity for [Stanford] to be the neutral place where a lot of these folks [from industry] can come, as was mentioned.

Professor Gabriella Safran: “I was wondering if you could talk about how the institutes deal with colleagues in other countries and with problems outside of the United States. Are there some ways in which the institutes allow for a kind of different view of the rest of the world than the departments allow for? In FSI [I can see how this might be the case] but in the other institutes--how do they see the rest of the world?”

Director Orr responded, “In the Global Climate and Energy Project, sponsors work not just at Stanford, but at 26 other institutions around the world--Australia, Japan and Europe, and a variety of places. It’s a deliberate attempt to bring together a research community focused on reducing greenhouse gas emissions from a variety of points of view.”

Director Blacker, “Most of the folks we bring in are not from the U.S. They come as visiting scholars, sometimes as visiting faculty. We try to get as many of our students out into the world as possible. I can’t tell you how many times in my now long career I have had students come back and say, ‘You know, I never understood my own country, meaning the U.S., until I stood outside of it.’ And that’s true for us. We try to

put as much money behind those types of activities as possible because none of what we do can be solved by the U.S. alone, virtually, by definition.”

Director Koseff joined in, “In the Woods Institute, if you talk about water, I showed you that example of reducing child mortality in Mozambique. Water-borne diseases have a huge impact. The work of Jenna Davis is primarily in Tanzania and Mozambique...for environmental problems and sustainability issues, by definition, it will have an international focus. “

Professor Andrew Fire had a question for Dean Arvin: “What do you do when a group of faculty members from diverse departments put a proposal on your desk for an institute? How do you decide if the institute proposed would be a structure that will facilitate interactions that wouldn’t occur otherwise? How do you decide whether [the interactions] wouldn’t occur without an institute, and what the value of the quality of the interactions would be?”

Dean Arvin replied, “There are a few times we’ve had proposals that really didn’t seem to be headed in the direction we see for the typical institutes and centers that we have. [Also] what we did see is that there was not a critical mass of faculty coming forward with these proposals. They may not have had a concept for how they’re going to build the resources.

“We have to judge whether the idea is timely, whether there is enough interest among diverse groups of faculty to carry it forward and enough partners out there to support the enterprise...I think that the critical mass issue has [often been the issue]. Then I take the proposals to John [Provost Etchemendy], and he decides.”

[ Laughter ]

Provost Etchemendy. “One of the first questions I’d ask -- after Ann has ascertained whether or not there really is a critical mass of faculty--is, why can’t this be done in a school? And if the answer is—‘We have faculty in this other school that are interested in working [on this project]’, I respond, ‘So what? There are a lot of things that are centered in one school that involve faculty from other schools.’ So that’s not an adequate response.”

Chair Goldsmith called this very interesting session of the Senate to a close by expressing her deepest appreciation to all the panelists.

[ Applause ]

## **V. Unfinished Business**

There was no unfinished business.

**VI. New Business**

There was no new business

**VII. Adjournment**

A motion to adjourn was moved, seconded and approved by unanimous voice vote. The meeting adjourned at 4:55 PM.

Respectfully submitted,

Rex L. Jamison, MD  
Academic Secretary to the University

February 18, 2010  
**Meeting of Senate XLII**  
**RECORD OF ATTENDANCE**

	<b>Name</b>	<b>Unit</b>
A	Admati, Anat, <i>Graduate School of Business</i>	01
A	Aiken, Alex, <i>Computer Science</i>	04
P	Anderson, Lanier, <i>Philosophy</i>	08
A	Arvin, Ann, <i>Vice Provost &amp; Dean of Research</i>	<i>Ex officio</i>
A	Baker, Keith, <i>History</i>	07
A	Bambos, Nicholas, <i>Management Science &amp; Engr'g</i>	04
A	Bent, Stacey, <i>Chemical Engineering</i>	04
A	Berger, Jonathan, <i>Music</i>	08
A	Blau, Helen, <i>Microbiology and Immunology</i>	12
P	Boardman, Gregory, <i>Vice Provost for Student Affairs</i>	<i>Ex officio</i>
P	Boxer, Steven, <i>Chemistry</i>	06
A	Bravman, John, <i>Vice Provost for Undergraduate Education</i>	<i>Ex officio</i>
P	Brown, Jr., Gordon, <i>Geological and Environ Sciences</i>	02
P	Burchat, Patricia, <i>Physics</i>	06
A	Burke, David, <i>SLAC</i>	10
P	Chang, Gordon, <i>History</i>	07
A	Cohen, Harvey, <i>Pediatrics</i>	13
P	Drell, Persis, <i>Director of SLAC</i>	<i>Ex officio</i>
A	Elam, Harry, <i>Drama</i>	08
A	Eliashberg, Yakov, <i>Mathematics</i>	06
P	Etchemendy, John, <i>Provost</i>	<i>Ex officio</i>
P	Fire, Andrew, <i>Pathology</i>	12
P	Goldsmith, Andrea, <i>Electrical Engineering</i>	04
P	Greely, Henry, <i>Law</i>	09
P	Gumpert, Patricia, <i>Vice Provost for Graduate Education</i>	<i>Ex officio</i>
P	Hadly, Elizabeth, <i>Biology</i>	06
P	Hennessy, John, <i>President of the University</i>	<i>Ex officio</i>
P	Horwitz, Ralph, <i>Medicine</i>	13
P	Jamison, Rex, <i>Academic Secretary to the University</i>	<i>Ex officio</i>
P	Kao, Peter, <i>Medicine</i>	13
A	Kasevich, Mark, <i>Applied Physics</i>	06
P	Keller, Michael, <i>University Librarian &amp; Dir. of Acad. Info.</i>	<i>Ex officio</i>
P	Koseff, Jeffrey, <i>Civil &amp; Environmental Engr'g</i>	04
P	Kramer, Larry, <i>Dean of the Law School</i>	<i>Ex officio</i>
P	Krasner, Stephen, <i>Political Science</i>	11
P	Lazzeroni, Laura, <i>Psychiatry/Behavioral Sciences</i>	13

	<b>Name</b>	<b>Unit</b>
P	Marshall, Lawrence, <i>Law</i>	09
P	Matson, Pamela, <i>Dean of the School Earth Sciences</i>	<i>Ex officio</i>
P	McFarland, Daniel, <i>Education</i>	03
P	Ober, Josiah, <i>Political Science</i>	07
P	Osgood, Brad, <i>Electrical Engineering</i>	04
P	Palumbo-Liu, David, <i>Comparative Literature</i>	08
A	Pizzo, Philip, <i>Dean of the School of Medicine</i>	<i>Ex officio</i>
A	Plummer, James, <i>Dean of the School of Engineering</i>	<i>Ex officio</i>
P	Ridgeway, Cecilia, <i>Sociology</i>	07
P	Roberts, Eric, <i>Computer Science</i>	04
P	Safran, Gabriella, <i>Slavic Languages and Literature</i>	08
P	Saller, Richard, <i>Dean of the School of Humanities &amp; Sciences</i>	<i>Ex officio</i>
A	Saloner, Garth, <i>Dean of the Graduate School of Business</i>	<i>Ex officio</i>
A	Shaqfeh, Eric, <i>Chemical Engr'g/Mech Engr'g</i>	04
A	Sheppard, Sheri, <i>Mechanical Engineering</i>	04
P	Simoni, Robert, <i>Biology</i>	06
P	Sinclair, Robert, <i>Materials Science and Engineering</i>	04
P	Solgaard, Olav, <i>Electrical Engineering</i>	04
A	Sommer, Matthew, <i>History</i>	07
A	Stevenson, David, <i>Pediatrics</i>	13
P	Stipek, Deborah, <i>Dean of the School of Education</i>	<i>Ex officio</i>
P	Summit, Jennifer, <i>English</i>	08
A	Taylor, Kenneth, <i>Philosophy</i>	08
A	Theriot, Julie, <i>Biochemistry</i>	12
A	Tiedens, Larissa, <i>Graduate School of Business</i>	01
P	Vermeule, Blakey, <i>English</i>	08
P	Walbot, Virginia, <i>Biology</i>	06
A	Wein, Lawrence, <i>Graduate School of Business</i>	01
P	White, Brian, <i>Mathematics</i>	06
P	Wigen, Kären, <i>History</i>	07
P	Willinsky, John, <i>Education</i>	03
P	Wise, Paul, <i>Pediatrics</i>	13
A	Wright, Gavin, <i>Economics</i>	07
P	Yanagisako, Sylvia, <i>Anthropology</i>	07
A	Zoback, Mark, <i>Geophysics</i>	02

**Present on Invitation or by Request:**

Chip Blacker, Lynn Orr, Bill Newsome, Iris Litt, Aron Rodrigue, Sara Bible, Jim Sweeney, Gopi Shah Goda, Deborah Carvalho, Donna Lawrence, Pat Cook

**Present on Standing Invitation:**

Kenneth Scott, Stephanie Kalfayan, Lindi Press, Kathleen Sullivan, Varun Sivaram, Kathleen Sullivan, Elaine Enos

**Outside Press:**