DESPITE THE CHALLENGES presented by the ongoing global economic crisis, the Physics Department continues to receive much needed support for its educational and research programs. In this Newsletter, we are featuring some of the fellowships and awards that are supported by gifts and endowed funds generously provided over the years by friends of the Physics Department. These gifts allow us to improve our teaching infrastructure, recognize outstanding scholarly achievements of our Physics majors, reward graduate teaching assistants who demonstrate extraordinary commitment to undergraduate teaching in Physics, attract top post-doctoral research associates, and support junior faculty to pursue new research ideas. We hope you enjoy reading about the achievements recognized or supported by your gifts.

I am happy to announce that three of our faculty members were promoted last year to tenured Associate Professor in Physics: Tom Abel, Steve Allen, and David Goldhaber-Gordon. We congratulate them on this recognition that they are world leaders in their fields, and we look forward to their future contributions to the University in research, mentoring, teaching and service. We are very fortunate to be able to continue our faculty searches in condensed matter and particle theory this year, despite severe budget constraints. We hope to welcome new faculty to our department soon.

In March 2008, researchers from all around the globe visited Stanford/SLAC to attend the annual Cosmology and Gravity Meeting of the Canadian Institute for Advanced Research (CIFAR) and to celebrate the 60th birthday of Prof. Andrei Linde. The LindeFest and the dinner afterwards focused on Andrei’s seminal contributions to shaping our views of the Universe — its birth, its history and its evolution into the future.

The research and teaching of Prof. (Emeritus) Robert Wagoner were honored at the Wagoner Invitational, a Symposium on Astrophysics and Cosmology held in November 2008. The Wagoner Invitational was attended by colleagues, current and former students, and friends. The guests enjoyed a series of presentations that touched on Bob’s many research contributions, including big bang nucleosynthesis, general relativity and the physics of black holes. The day concluded with an evening of dinner, dancing and karaoke, where we had the opportunity to experience the vocal talents of the Physics community!

To celebrate the 70th birthday of Prof. Vahe Petrosian, we are planning the PetrosianFest on April 18, 2009, which will feature five distinguished speakers who will reflect on Vahe’s contributions to astrophysics and summarize the current state of knowledge in the fields to which he has contributed.

In 2007/08, I chaired a committee in the Physics Department to consider how we could revise the introductory physics courses and associated labs, with the goal of improving the pedagogy in the courses and enhancing the learning experience for the ~500 undergraduates to whom we teach introductory physics each quarter. We have started implementing the recommendations of the committee. Last summer, we hired a new Physics Education Specialist, Dr. Chaya Nanavati, to help implement changes based on Physics Education Research — in particular, active engagement in lectures, collaborative learning in discussion sections, and inquiry-based laboratories. During this academic year, we have hosted four national figures in Physics Education Research: Professors Joe Redish from U. of Maryland, Gary Gladding from U. of Illinois, Eric Mazur from Harvard U., and Carl Wieman (Ph.D. 1977, Nobel 2001) from the U. of Colorado and U. of British Columbia. These visitors gave seminars and workshops on the results of research on how students learn (or don’t learn!) physics and met in smaller groups to help us develop our plans. Although implementing change always presents challenges,
In 2005, the Physics Department received a generous gift of $250,000 from an anonymous donor to honor Karl van Bibber, who served as Assistant Professor in the Stanford Physics Department from 1980 to 1985. The donor received his B.S. in Physics at Stanford and was a student of van Bibber’s. Karl van Bibber served in the Physical Sciences Directorate at the Lawrence Livermore National Laboratory (LLNL) until recently, when he accepted the position of Vice-President and Dean of Research at the Naval Postgraduate School in Monterey. He said of the van Bibber Fellowships, “When I received the phone call from the director of development telling me about the gift to Stanford for the endowment of the Fellowships, I was stunned. I did take my teaching very seriously, and it just goes to show that you never can tell the impact that your efforts have on the lives of others. I’m really looking forward to following the careers of the five young scholars who will benefit from these fellowships.”

The Karl van Bibber fund was established to support postdoctoral fellows, and will be spread over a period of five years ($50k per year). “Postdocs,” as they are known for short, are recent Ph.D.s who will spend a few years (typically two to four) focusing on research to broaden and deepen their skills while making essential contributions to front research, before applying for a permanent position. Postdocs are highly valued members of a research team and often provide some of the mentoring and training for undergraduate and graduate students.

The first Karl van Bibber Fellowships were given to support postdoctoral research associates working in the groups of Professors Sarah Church and Giorgio Gratta. Dr. Peter Fierlinger worked in Prof. Gratta’s group on the EXO (Enriched Xenon Observatory) project, a search for neutrinoless double beta-decay. His work has substantially advanced the design of a very large detector that will explore the origins of particle masses and the connections between particle physics and cosmology. Dr. Fierlinger has since become a professor at the Technical University Munich where he is contributing to the setup of a world-class ultra-cold neutron lab. Dr. Judy Lau, in Prof. Church’s group, is currently working on developing a new generation of instruments to measure the polarization of the Cosmic Microwave Background, lensing, and the Sunyaev-Zel’dovich effect. These measurements will be made using scalable arrays of Monolithic Millimeter-wave Integrated Circuit (MMIC) amplifiers, integrated into mass-producible miniature modules. The van Bibber fellowship has allowed Dr. Lau to work on new measurement techniques that were not funded at the time.

Last year, a van Bibber Fellowship was awarded to Dr. Kenjiro Gomes, who joined Prof. Hari Manoharan’s group last fall. Dr. Gomes is working on nanoscale science measurements using scanning tunneling microscopes capable of manipulating single atoms. His work will target interesting new quantum materials in which quantum mechanical phase, the topology of the electronic states, and other internal degrees of freedom lead to new states of matter.

Another van Bibber Fellowship will support James Williams, who will work in Prof. David Goldhaber-Gordon’s group. Dr. Williams will modify and study graphene — a single honeycomb sheet of carbon atom material, which became accessible to experimental investigation only four years ago and has since been one of the hottest topics in condensed matter physics. James plans to chemically modify graphene to induce novel many-particle states, including superconductivity, and see how these are different in graphene than in conventional materials.

Musing on his recent career change, van Bibber commented, “I guess the establishment of the postdoctoral fellowships led me to think how much I missed academia, and now here I am!”

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Thanks very much to those of you who attended our Physics alumni reunion reception, held on Friday, October 10, 2008, as part of the Reunion Homecoming Weekend.

The Physics department reception was attended by approximately 40 physics alumni, in addition to a number of Physics faculty, staff and current students. Dept. Chair Patricia Burchat, and Physics faculty Tom Abel, Roger Blandford, Stefan Funk, Giorgio Gratta, Peter Michelson, Doug Osheroff, and Bob Wagoner enjoyed chatting with our alumni and their families.

Please look for announcements of future alumni events on our website: http://www.stanford.edu/dept/physics/.
After nearly a decade of design and development by an international team led by Stanford University, NASA launched the Large Area Telescope (LAT) into orbit on June 11, 2008. LAT is the primary instrument on the Fermi Gamma-ray Space Telescope (formerly known as GLAST, for Gamma-ray Large Area Space Telescope). Following GLAST’s successful activation, NASA renamed the observatory for Enrico Fermi, a pioneer in high-energy physics and astrophysics.

The Stanford participation in Fermi includes physicists, students, and engineers from the Hansen Experimental Physics Laboratory, the SLAC National Accelerator Laboratory, and the Kavli Institute for Particle Astrophysics and Cosmology. The instrument science operations center for the Large Area Telescope is located at SLAC. Professor Peter Michelson in the Physics Department is the Principal Investigator and leads the international Fermi LAT Collaboration with nearly 200 members from France, Italy, Japan, Sweden, Germany, Great Britain, and the United States.

Following the on-orbit checkout of the spacecraft and activation of the LAT, the Fermi Gamma-ray Space Telescope began surveying the sky in July 2008. Fermi’s LAT scans the entire sky every three hours when operating in “survey mode,” which will occupy most of the telescope’s observing time during the first year of operations. These fast snapshots let the science team monitor rapid changes characteristic of the violent gamma-ray universe. The telescope is sensitive to photons with energies ranging from 20 MeV (million electron volts) to over 300 GeV (billion electron volts). The high end of this range, which corresponds to energies more than 3 million times greater than dental x-rays, is largely uncharted territory.

Here are some of the science highlights from the first several months of observations:

- Discovery of a large number of gamma-ray pulsars, including a new class of pulsars that are not detected as pulsars in the radio, optical, or x-ray parts of the electromagnetic spectrum.
- Frequent observations of gamma-ray flares in active galaxies, some at distances greater than 10 billion light-years from earth.
- Observations of high-energy gamma-ray bursts with a frequency of about one per month, including one that occurred more than 12 billion light-years from earth and another that was the first detection of high-energy emission from a short-duration burst thought to arise from the coalescence of two neutron stars.

Fermi’s first map of the gamma-ray sky from the Large Area Telescope is shown in this false-color image, an all-sky view that looks toward the center of our Milky Way Galaxy with the galactic plane projected across the middle. What shines in the gamma-ray sky? Along the galactic plane, energetic cosmic rays collide with gas and dust to produce the diffuse gamma-ray glow. Some of this diffuse emission may also be from decays and annihilation of dark matter particles. Sources of strong emission from spinning neutron stars or pulsars, and distant active galaxies known as blazars, can also be seen. A prelude to future discoveries, this image combines only 4 days of observations, equivalent to a year of observations with EGRET that flew on the Compton Gamma-Ray Observatory mission of the 1990s. In addition to the ability to monitor gamma-ray bursts, the greatly improved sensitivity will allow Fermi to look deeper into the high-energy Universe.
All of us in the Stanford community are grateful for the enduring legacy of the late Prof. Melvin Schwartz, Nobel laureate and member of the Stanford physics faculty from 1966 to 1983. In 1988, Mel Schwartz shared the Nobel Prize in Physics with Leon Lederman and Jack Steinberger “for the neutrino beam method and the demonstration of the doublet structure of the leptons through the discovery of the muon neutrino.” He also founded Digital Pathways, a very successful Silicon Valley company. His contributions to physics were well respected and far-reaching. Professor Schwartz passed away in 2006 at age 73, after a courageous struggle with Parkinson’s disease.

In 1981, Prof. Schwartz established a fund to help deserving junior Physics faculty pursue new research ideas. Over the years, the fund grew so that we have been able to award the Mel Schwartz Fellowship for three years after Prof. Schwartz passed away.

In 2007, David Goldhaber-Gordon was awarded the fellowship to develop a virtual scanning tunneling microscope. This tool is designed to map how electrons organize themselves in low-dimensional (1D, 2D) semiconductor structures, which previously could only be inferred from indirect measurements.

In 2008, Stefan Funk was awarded the fellowship to pursue the development of a future ground-based gamma-ray telescope, for which sensitive light detectors and a fast and reliable readout system are now being developed.

Finally, in 2009, Chao-Lin Kuo was awarded the fellowship to support his work on developing instrumentation for time and energy resolving studies of pulsars with superconducting detectors in visible wavelengths.

The Physics Department is grateful to the Schwartz family for their generosity and friendship, and to the School of Humanities and Sciences and the Office of the Dean of Research, for providing matching funds each year to extend these benefits to our newest faculty.

** New Graduate Fellowships **

We are pleased to recognize these very generous donors who have recently made commitments to endow graduate fellowships in physics. Each of the donors has a special connection to physics at Stanford.

Hannah Siemann established the Robert H. Siemann Graduate Fellowship, in memory of her late husband, Bob Siemann, who passed away in September 2008. Bob was a renowned accelerator physicist who joined the faculty at SLAC in 1991 and held a courtesy appointment in Applied Physics. Persis Drell, Director of SLAC, remarked that “Bob was devoted to teaching and his students, and these fellowships are a wonderfully appropriate way to recognize his contributions in educating generations of accelerator physicists.” Two fellowships will support graduate students in Physics or Applied Physics working in particle or accelerator physics.

Nancy and Robert Morrell of Brunswick, Maine, endowed the Paul Harmon Kirkpatrick Fellowship in honor of Nancy’s late father, a long-time professor in the Department of Physics. (See Kirkpatrick Awards article, p. 6.) The fellowship will benefit students pursuing a doctorate in Physics or Applied Physics, with a preference for students seeking a career in teaching.

Margaret McCaul has established a Charitable Remainder Unitrust, which ultimately will fund the McCaul Family Graduate Fellowship for students in Physics. Margaret’s brother, Bruce (M.S. ’63, Ph.D. ’69 Physics), and his wife, Karen (B.A. ’63 French, M.A. ’64 Education) established a Charitable Remainder Unitrust at the same time, which ultimately will fund an undergraduate scholarship.

These gifts to physics were matched by funds from the William and Flora Hewlett Foundation. Richard Saller, Dean of the School of Humanities and Sciences, allocated the matching funds because the money will support one of the school’s highest priorities: attracting and supporting the best graduate students. The fellowships will support the education and training of tomorrow’s leaders in science and technology, education and policy, or any of the broad range of fields to which our graduates contribute.

Ping Feng Receives the Arnice P. Streit Award for 2008

We are very happy to report that Ping Feng, an Administrative Associate in the Physics Department since 2001, has received the Arnice P. Streit award for distinguished service. This prestigious award recognizes outstanding administrative contributions by a non-academic staff member in the School of Humanities & Sciences. Ping supports a very busy research group in her role as their financial management analyst. The Streit award recognizes her creativity, diligence, and effectiveness in performing her responsibilities. Ping has risen to many challenges in her job with good humor and sound judgment, and she is much appreciated by our faculty, staff and students. Ping originally came to Stanford in 1994, and we feel very fortunate that she joined our staff. All of us in the Physics Department congratulate Ping on this well-deserved award.
LYNFORD GODDARD (Ph.D. 2005). As an Assistant Professor of Electrical and Computer Engineering at the University of Illinois, Lynford Goddard is putting his background in math and physics to excellent use. Lynford earned a number of degrees from Stanford: a B.S. in Math and Physics with a minor in Japanese (1998), an M.S. in Electrical Engineering (2003), and a Ph.D. in Physics with a minor in Math (2005). In 2005-07, Lynford was a post-doc at Lawrence Livermore National Laboratory, where he researched photonic integrated circuits, photonics-based sensors, and all-optical data processing systems. In 2007, he joined the faculty at Illinois, where his research group focuses on building high-speed chip-scale monolithic photonic systems.

Lynford credits his mother as the early influence on his career trajectory. When he was only four years old, she used games and songs to spark an interest in math, and she continued to encourage him in his studies as he grew up. When he reached college, he describes being “turned on to physics” after seeing a demonstration of a pellet hitting a falling monkey in a Physics 51 class (never underestimate the power of a clever demo!). His pursuit of science as a career was also influenced by his participation in a program called SEMAP (Science, Engineering, and Mathematics Achievement Program), where he met and worked with other students of color who shared his interest in science and engineering. During graduate school at Stanford, Lynford was a Teaching Assistant whose excellence in teaching was recognized with a Paul K. Patrick Award. While at Stanford, Lynford also started a physics and math tutoring service geared to local high school and college students, where his talent and passion for teaching blossomed. Seeing those students understand the concepts and begin to make connections was a real thrill for Lynford. But in addition to teaching, Lynford also wanted to continue pursuing research. Becoming a professor gave him the opportunity to work with students not only in the classroom, but also in the lab.

Lynford uses physics to teach his department’s junior-level course in electromagnetic fields. In the lab, he uses the quantum and statistical mechanics he learned as a physics major and in graduate school. He credits physics with helping him develop a practice of approaching a problem by drawing clear diagrams and deciding which quantities are relevant and which are negligible, and of using “back of the envelope” thinking to quickly evaluate the feasibility of a proposed idea.

When asked to give advice to physics or engineering majors interested in academic careers, Lynford suggests they explore the many sub-disciplines of physics to find what they’re most passionate about. Doing so led him first to optics and later to semiconductor devices. He says, “Physics is all around us: permeating from the smallest scale atomic structures to gigantic astronomical length scales. We encounter its laws in everything we do and see.” Lynford says that his physics degree has served him well. “Every day, I’m able to push the frontiers of photonic devices and nanotechnology, and challenge the next generation of researchers, teachers, and investigative minds to help solve new and exciting problems.”

KATHY O’SHAUGHNESSY, Ph.D. 1990, has traveled a long way career-wise from helping to build particle physics detectors at SLAC in the 1980’s. Her scientific skills are more broadly put to use working in the medical device industry as a Vice President of Clinical and Regulatory Affairs. Geographically, however, she still works only a few miles from campus since there is a wealth of medical device companies in the Bay Area.

Kathy obtained her B.Sc. degree in Physics and Mathematics at the University of Victoria in Canada. “I was thrilled at the opportunity to do my Ph.D. research at Stanford because of the close connection with SLAC. I had done some work as an undergraduate in subatomic physics and the experimental work was fascinating.” She worked with various groups at SLAC until joining the Mark II collaboration to help build and commission the tracking detector that became the first apparatus to record the decays of the Z° boson created by the SLAC Linear Collider. After completing her Ph.D., she was a postdoc at the Santa Cruz Institute for Particle Physics (SCIPP) where she worked on a variety of experiments, including the Superconducting SuperCollider in Texas and the DESY facility in Hamburg, Germany.

At this point circumstances, both professional and personal, led to a career change. Not wanting to leave the Bay Area and with limited faculty positions available, Kathy decided to consider opportunities outside academia. In less than a week after making that decision, she had a job offer! One of the founders of a medical device startup company was a former particle physicist and was looking for someone who could develop image analysis software. “Although I didn’t know anything about the product area, mammography, I knew that I could write this software using skills developed in particle physics, and this company continued on page 6
For twenty years, the Stanford Physics Department has been pleased to award excellence among our graduate teaching assistants with the Paul H. Kirkpatrick award. This Award was established to recognize those graduate students who have demonstrated a talent for and commitment to the teaching of physics to undergraduates, thereby exemplifying the dual commitment to teaching and research characteristic of Paul Kirkpatrick’s own scientific life. Paul H. Kirkpatrick was a distinguished member of the Stanford Physics Department for 28 years before retiring in 1960. He died in December 1992 at the age of 98. Although well known for his 40 years of x-ray research, for the invention of the x-ray microscope, and for his pioneering work in scientific holography (long before the invention of the laser), he is at least as famous for his spirited championship of the importance of furthering excellence in the teaching of physics. Paul Kirkpatrick’s strength of character, integrity and compassion were much admired by colleagues, family and friends.

The Physics Department congratulates the 41 Kirkpatrick awardees listed here, many of whom have gone on to distinguished teaching careers in Physics. We are grateful to the original donors for establishing this endowed fund that will allow us to continue to award excellence in teaching.

### Paul Kirkpatrick Award

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BRINDA THOMAS (B.S. 2005). As a first-year Ph.D. student in the Engineering and Public Policy Department at Carnegie Mellon University, Brinda finds that her physics background helps her to keep up with the graduate electrical engineering students in her engineering classes. Brinda is strengthening her engineering background for her graduate research on the energy efficiency implications of direct current (DC) power distribution systems in commercial and residential buildings. Having just finished her first policy analysis courses, she notes, “My would at least be a good stepping stone into industry. It turned out it was a great move — I spent 9 years at R2 Technology, moving from software and product development to designing and managing clinical studies that measure how well the software works. Eventually I also learned how the technical and clinical information needed to get products approved by the FDA (Food and Drug Administration).”

Since then she has worked in medical device companies, mostly start-ups, in the areas of radiation oncology, phototherapy and energy-based products for dermatology. “There are two aspects to this field that I find extremely rewarding: seeing the results of physicians using our products to help improve patient care and being able to use my technical background to help prove the effectiveness of new devices and explain them to different audiences.” Although she does not directly use her formal physics training often, she uses the same principles to develop clinical studies that are scientifically and statistically sound. “If I were an undergraduate now with the opportunity to train in medical physics or biophysics, I would certainly try it out. You have the opportunity to work in clinics or in industry and with a great community of people. Physicists are very well-respected contributors to the medical device industry.”

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we are very excited about the positive changes that have already resulted from this effort; for example, we see a renewed engagement in teaching and dialogue about pedagogy among the faculty, staff and graduate teaching assistants. We believe that this revamping of our introductory courses will have long-term positive results on the increasing number of students who are taking physics courses and majoring in physics at Stanford. These efforts have been made possible by funds from the School of Humanities and Sciences via a general gifts fund for Undergraduate education.

In this newsletter we are continuing a tradition started last year; we are featuring three physics alumni whose stories illustrate the wide-ranging career options possible with a physics degree. We hope you enjoy reading about some of the exciting and diverse career paths our former students have taken.

Several of our Physics faculty received prestigious honors in the past year. We were very pleased that Prof. Alexander Fetter received the 2008 Dean’s Award for Lifetime Achievement in Teaching. Sandy has made exceptional contributions to the education of undergraduate and graduate students over his career, through his clear lectures, his thoughtful assignments, his textbooks, and his obvious concern for teaching and mentoring. We congratulate him on this well-deserved recognition. In addition, Prof. Andrei Linde was elected to the National Academy of Sciences, Prof. Vahe Petrosian was elected to the Armenian National Academy of Sciences, Prof. Risa Wechsler received a Hellman Faculty Scholar Award, and Prof. Chao-Lin Kuo recently received a prestigious Sloan Fellowship.

Professor Savas Dimopoulos was appointed as the inaugural Hamamoto Family Professor in the School of Humanities and Sciences. David (B.S. ’81) and Marty Hamamoto (Parents ’10) are strong supporters of Stanford and have served in many volunteer roles. They are currently co-chairs of the Stanford Parents’ Advisory Board. The Professorship recognizes Savas as one of the leading figures in theoretical particle physics. He focuses on the exploration of new possibilities for physics beyond the “Standard Model” and how they can be tested in future experiments.

Professor Andrei Linde was recognized with the Harald Trap Friis Professorship. Andrei is one of the authors of inflationary cosmology. His current research involves the theory of dark energy, investigation of the global structure and fate of the universe, cosmological constraints on the properties of elementary particles, and quantum cosmology. Among other accomplishments, Harald Trap Friis played an important role in the design of radio receivers used by his colleague, Karl Jansky, at Bell Labs, to detect and record galactic radio noise in the early 1930’s. These observations launched the new science of radio astronomy, which has played an important role in cosmology. Friis died in 1976 at age 83. Friis’ widow, who lives in Palo Alto, enjoys painting depictions of black holes, which she has shared with Andrei. This Professorship is an excellent match to Andrei’s research interests and accomplishments!

Former Physics student Andrei Bernevig (Ph.D. 2006, B.S. 2001) was awarded the McMillan Prize, given annually to recognize outstanding contributions by a young condensed matter physicist. Andrei’s Ph.D. mentor was Prof. Shoucheng Zhang. Physics major Christina Hall was honored with a 2008 Firestone Medal for excellence in undergraduate research. Christina’s thesis, titled “Creating and Testing a Dynamic Model of Human Thermoregulation”, resulted from research she conducted in the group of Prof. Craig Heller in Biology. Physics majors Erica Cherry and William East received the 2008 Dean’s Award for Academic Accomplishment. In addition, Erica was awarded the Departmental Award for Excellence in Honors Thesis Presentation. Erica majored in Physics with a minor in Mechanical Engineering. She was recognized for her work with Prof. John Eaton (ME) on measurements and simulations of turbulent flow, and her talents in classical music and teaching. William East was honored for his research on particle acceleration in astrophysical plasmas, conducted under the mentorship of Prof. Vahe Petrosian. The 2008 Levine Award for top junior physics majors went to Jessica Lee and Douglas Stanford for their stellar academic records and their contributions to research. Douglas was awarded a Marshall Scholarship to attend a British university of his choice. The Jeff Willick Memorial Award is given to an outstanding senior physics major, with a preference for a student studying astrophysics; the 2008 Willick Award was given to Tony Pan, who also worked with Prof. Petrosian. These awards reflect the important role research plays in education at Stanford. Approximately 45 Stanford Physics and Engineering Physics majors participate in the Physics / Applied Physics / SLAC Summer Research Program each year. Two of the undergraduates I mentored in research last summer are pictured in the cover photo on this Newsletter. We are very grateful for the gifts that support undergraduate research at Stanford.

We are very proud of Physics staff member Ping Feng, who received the 2008 Arnice P. Streit Award for distinguished service to the School of Humanities & Sciences and commitment to excellence in her administrative role in our department.

We hope that you will consider attending the upcoming Robert Hofstadter Memorial lecture by Prof. Alexander Vilenkin, Professor of Physics and Astronomy at Tufts University, on April 6, and the 27th Annual Bunyan Lecture by Prof. Alexei Filippenko, Professor of Astronomy at University of California, Berkeley, on May 4. Professor Vilenkin will speak about “Many Worlds in One” in Room 200 in the Hewlett Teaching Center at 8 p.m. on Monday, April 6. Professor Vilenkin is Director of the Tufts Institute of Cosmology; his publications include a popular book entitled Many Worlds in One: The Search for Other Universes. Professor Filippenko will give a presentation on “Dark Energy and the Runaway Universe” in the Braun Auditorium in the Mudd Chemistry Building at 7:30 p.m. on Monday, May 4. Professor Filippenko is known for his groundbreaking research in observational cosmology and his commitment to education. His awards for education include the 2006 national Professor of the Year Award for doctoral and research universities, continued on page 8
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and the Carl Sagan Prize for Science Popularization.

This past October, we enjoyed the chance to meet with those of you who attended our Physics alumni reception during Homecoming Weekend. I encourage interested physics alumni to attend next October’s reception, or feel free to visit anytime you are in the area! Our website will feature plans for the next reception and other upcoming events throughout the year: http://www.stanford.edu/dept/physics/.

On behalf of the department, I sincerely thank you for your continued interest and support, which is so important and appreciated by all of us. 

Best wishes,

Patricia Burchat
Chair and Gabilan Professor of Physics

Alumni – from page 6

scientific training has allowed me to appreciate the need to develop testable models and hypotheses and quantify uncertainties in order to approach the analysis of policies in a systematic and rational manner.” Brinda sees her graduate degree as the ideal preparation for a career studying interdisciplinary policy problems in which the technical details matter, such as the study of the energy industry.

After graduating from Stanford, Brinda pursued her interest in energy policy by entering the energy consulting industry in Washington, DC. In her position as a contractor for the U.S. Department of Energy (DOE)’s Hydrogen program, it was her writing skills rather than her differential-equation solving abilities that were in high demand as she helped the program staff communicate the significance of the results of their research to DOE upper management, Congress, and the general public. She later joined Navigant Consulting, Inc.

to analyze the energy savings potential of light-emitting diodes in a dozen niche market applications.

Brinda advises physics students seeking to enter the energy policy field to reflect on the skills they already have and those they want to develop further when searching for a policy job. Opportunities in the policy arena range from federal agency, congressional staff, and consulting positions, to traditional analytical positions found at national labs, think tanks, academic research groups, and some consulting firms. “Be prepared to explain what motivates you to work on energy policy problems rather than to seek breakthroughs in fundamental physics,” Brinda advises. “A graduate degree is helpful, especially for analytical positions. A physics background coupled with some policy work experience provides an edge in the graduate admissions process and a deeper appreciation of government operations to guide policy-focused research.”

Space Telescope – from page 3

neutron stars in a distant galaxy.

- Detailed observations of diffuse gamma-ray emission from the Milky Way Galaxy. Ongoing analysis is determining how much of this radiation is generated by cosmic-rays in the galaxy and might eventually reveal signatures of diffuse emission generated by dark matter.

- Major progress on measuring the spectrum of cosmic-ray electrons and positrons to well above 1TeV (trillion electron volts) with unprecedented accuracy. This is relevant to the search for signatures of dark matter decays.

The Fermi Gamma-ray Space Telescope is expected to continue to beam data back to Earth for at least 5 years and probably longer, providing many students and researchers at Stanford and around the world with a far more sensitive view of the universe than ever seen in the gamma-ray part of the electromagnetic spectrum.