

# California State University Long Beach Physics and Astronomy 2009-2010 Newsletter #29

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## IN THIS ISSUE: SEE BELOW—AND MUCH, MUCH MORE



**The Department: Excellent Results from External and Internal Reviews**

### New Faculty 2010



**Yohannes Abate**



**Prashanth Jaikumar**



### National Science Foundation Early Career Award Dr. Thomas Gredig

In the NSF's own description, this is its "most prestigious award in support of the early career-development activities of those teacher-scholars who most effectively integrate research and education within the context of the mission of their organization."



### Joseph Day

Recipient of the College of Natural Sciences and Mathematics

#### **2010 Outstanding Thesis in the Physical Sciences,**

*Semirelativistic Few Body Problems with Matrix Continued Fraction Methods,*

**with thesis advisor, Prof. Zoltan Papp**



### K. Paul Gentry

Recipient of the College of Natural Sciences and Mathematics

#### **2009 Outstanding Thesis in the Physical Sciences,**

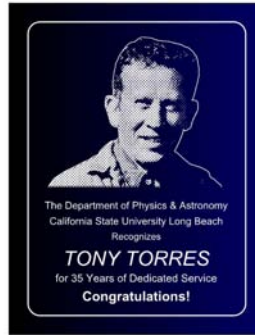
*Quantitative Grain Size Distribution of Iron Phthalocyanine ,*

**with thesis advisor, Prof. Thomas Gredig, whose photo is above.**

**Celebrate Irene Howard's 30 years** of Service, Heart, Compassion, Energy, and Good Cheer!



**Tony Torres celebrates 35 years of service!**



**RETIREMENTS : PROFESSORS M. ZAHUR ANWAR and ALFRED LEUNG, ADMINISTRATIVE SUPPORT ASSISTANT, SANDRA DANA**

**Professor M. Zahur Anwar**, after 45 years of teaching and research, has decided to enter the Faculty Early Retirement Program (FERP) in Fall 2010.



Dr. Anwar with **Sandra Dana** at 2010 Graduation.



**Professor Alfred Leung** at the 2010 Graduation, where four of his graduating M.S. students, **Fariba Allyasin, Roberta Johnson, Erika Levenson, and Rosie Nawpar**, produced research theses mentored by Dr. Leung

**Congratulations!** Alfred enters the Faculty Early Retirement Program (FERP) in Fall 2010.



**Sandy Dana's** retirement lunch, June, 2010, with Alfred Leung, Mark McLaughlin, Irene Howard, Sue Hu, Chuhee Kwon, Judy Anderson, and Simon George. At an earlier celebration in the Miller Japanese Garden on campus, Alfred and Zahur were presented with mementoes of their time here and Sandy received a \$400 gift certificate from the faculty and staff.

## The Year In Review by Patrick Kenealy, Chair

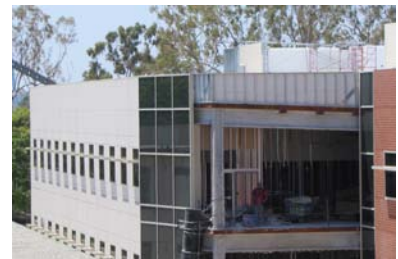
It has actually been two years since I last reviewed events for this column—and so many important changes and newsworthy accomplishments have occurred that we can only emphasize some highlights here, with greater detail later in this Newsletter or on our website: <http://www.csulb.edu/depts/physics/> .

**External and Internal Reviews of the Department of Physics and Astronomy.** The Department of Physics and Astronomy Self-Study Report is an event mandated for all departments every 5-7 years by University rules. The Department's own report forms the basis for an internal and external review, which occurred just before the 2008-2009 academic year. We are proud to report that both the external and internal committees had very good news for all of us. The reviews were very positive, and a summary of some of their findings and comments in the most important areas are given later in this Newsletter.

**We will begin to move into the new Hall of Science in about 8 months!** The building is actually slightly ahead of its construction schedule. We will occupy most of the second floor with our modern research and instructional laboratories and offices. The department will have an Astronomy platform with six telescopes on the roof of the building. A photographic tour of the building's progress is given later in this Newsletter.

**Our graduating classes of bachelor's and master's degrees have set local and national records in the last two years.** In 2009, we had 11 physics B.S. degrees and 11 M.S. degrees, nine of them with research theses. In 2010, we had 9 B.S. degrees and 17 (!) M.S. degrees with research theses, 6 of whom were women. Of the 2010 graduates, four are continuing on to Ph.D. studies: **Joe Day** at University of Graz, Austria; **Joe McEwen** at Ohio State University; **Toyanath Joshi** at West Virginia University; and **Julius De Rojas** at UC Davis.

A January, 2010, report issued by the American Institute of Physics (AIP) Statistical Research Center on *Physics Graduate Enrollments and Degrees* provides the basis for the claim that it is likely that CSULB currently has "nation-leading success rate" for Physics MS graduates. There are 64 Physics-Master's-granting institutions in the US. For the three years 2005-07, the annual average number of physics master's degrees at the top 15 MS-graduating universities was about 6 physics MS graduates per year, with top university, Ball State, IN, averaging 10 per year.



South facing side of west end of third floor, June, 2010.

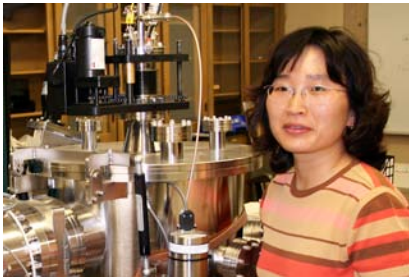


**Ten of our 2010 M.S. degrees** were earned by, from left, Min Schrader, Evan Silverstein, Jennifer Imai, Joe Day, Erika Levenson, Julius DeRojas, Fariba Allyasin, Adam Richie-Halford, Rosie Nawpar, and Joe McEwen.

**The Department has recently hired two excellent physicists** who began in the Fall, 2009, semester, **Dr. Yohannes Abate** and **Dr. Prashanth Jaikumar**. Descriptions of their work, photos, and plans are on later pages.

**More Good News!** Many members of the faculty have acquired important and noteworthy awards that provide external support and funding for both research and instructional efforts. Because they are so important to the vitality of the department's mission of teaching and research, some details of the awards are provided in a list in another section of this newsletter. These awards all represent ongoing impressive research and teaching accomplishments by the faculty. **So far, in grants initiated in the last 1.5 years, the total external support for the Department of Physics and Astronomy has reached \$1,710,381,** and at least one more external grant has been approved verbally.

**The Department is proud to announce** that, in 2010, the Provost and Senior Vice President for Academic Affairs, Donald Para, **awarded tenure and promotion to two of our faculty members based on their many outstanding accomplishments. Dr. Jiyeong Gu** was given tenure and promotion to Associate Professor and **Dr. Andreas Bill** was given tenure and promotion to full Professor.



**We extend our congratulations and appreciation for their hard work and dedication to both teaching and research.**

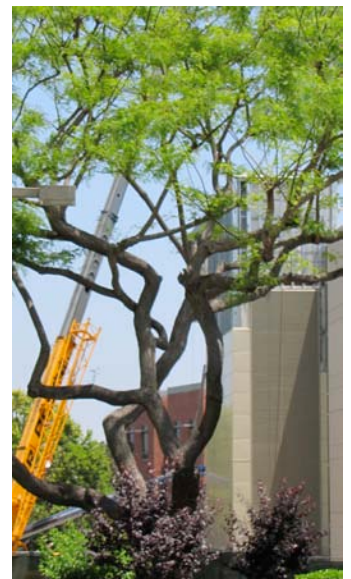
I cannot reasonably announce all the scholarships and accomplishments of our students and faculty in this column, so I hope you will page through the rest of our 2010 Newsletter.

**Support for our students' scholarships can be life-changing. Thanks very much for your attention and your help,**

Pat Kenealy



In the left photo, is a view of PH1, our current home, in the distance. The right photo shows the west face of the new Hall of Science, June, 2010.



# Hall of Science to open in January, 2011!

Immediately below, steel girders shape the new Hall of Science in June, 2009. The Hall will house the Physics and Astronomy Dept. on its second level.



Progress is seen above in late August, 2009.

Dean Laura Kingsford and Pres. Alexander are shown signing the last beam on Sept. 1, 2009.



In May, 2010, the new rooftop observatory platform for 6 telescopes becomes a reality.



**In June, 2010**, the building was almost completely enclosed. The red brick frames faculty offices (their mandated 110 sq. feet is seen to the right). Above right is an interior view of one of two large lectures halls that will be located at ground level in the NW corner.

## External and Internal Reviews of the Department of Physics and Astronomy

The Department of Physics and Astronomy Self-Study Report is an event mandated for all departments every 5-7 years by University rules. This report is the basis for a review by the university.

### The University appointed external reviewers:

The external reviewers came for an extensive visit. Interviews and meetings were held with faculty, graduate and undergraduate students, staff, and the Dean of the College (CNSM). Our undergraduate and graduate curriculum, laboratory facilities, and research facilities were examined.

**Professor Ruben Landau** from the University of Oregon, a theoretical physicist, a Fellow of the American Physical Society, and an expert on computational physics programs, and an author of two recent (2007) books, *A Survey of Computational Physics* (Harvard University Press) and *Computational Physics, 2nd Ed.* (Wiley-VCH).

**Professor Richard Robinette**, an elementary particle theorist from Pennsylvania State University, where he is Director of Undergraduate and Graduate Studies for the Physics Department, and also has the honor of being a Fellow of the American Physical Society.

**We are proud to report that both the external and internal committees had very good news for all of us.** The reviews were very positive, and the next few paragraphs below, in the most important areas, give a summary of some of their findings and comments.

### Tenure-Track Faculty, Lecturers and Staff

June, 2010, photo in Japanese Garden on campus.



- 1. The department has high-quality faculty comparable to those at major universities.** The faculty recognizes that having undergraduate students in research is an attractive strong point for the CSU system. Almost all of the faculty indicated satisfaction with their mix of teaching and research.
- 2.** The Department's part-time lecturers are a very important group within the department, and teach a majority of undergraduate FTES. Lecturers are well educated, generally put in more hours than are required, and some come in on weekends to help students, and are highly committed, professional, and effective teachers.
- 3.** The Staff are treated well overall; they enjoy their work, are competent, are dedicated to the students and faculty, and are treated well by the chair and faculty.
- 4.** Interactions with the Chair were handled fairly, diplomatically, caringly, and professionally.

### Undergraduate and Graduate Student Education

#### Summary of undergraduate students comments:

- 1.** They appreciated the small class sizes in the major courses. They liked the approachability of most of the faculty. They recognized the high quality of many of the courses, including the classical mechanics course, PHYS 310 (described in departmental materials as a 'lynchpin' class). They felt they are treated well as people.
- 2.** They appreciated the high quality of the advising given by Prof. Galen Pickett (who was deemed "very helpful").

**Graduate students' comments** provided a number of distinct, yet positive, impressions. As a group, they were engaging and spirited in presenting their views.

1. The graduate students are a very diverse group with an unusually large number of women; many of the students are holding down outside jobs. There is a sense of community among the students, with locations for them to meet informally, and with commitment to their education and research;
2. The students indicated satisfaction with the quality and accessibility of the graduate advising, as well as with documentation regarding the department's procedures;
3. They take their assistantship responsibilities most seriously, as documented, for example, by their wish to have better knowledge about how and what to teach.

***The faculty and staff of the Department of Physics and Astronomy take pride in the excellence and strength of its faculty and graduate and undergraduate programs, as acknowledged by a distinguished team of external and internal evaluators!***

**IRENE HOWARD**

For over 30 years, the Department has had the benefit of Irene Howard's invaluable help and caring heart. As Chair for the last six years, I can easily say that without her extensive knowledge and her willingness to help in all situations, the Chair's job would have been exceedingly harder and less pleasant. Thank you very much, Irene!



Pictured at right, in photos taken 30 years apart, is Irene and two now-emeritus Professors Ken Luke and Simon George.

## Dr. Yohannes Abate: Our Newest Experimental Physicist

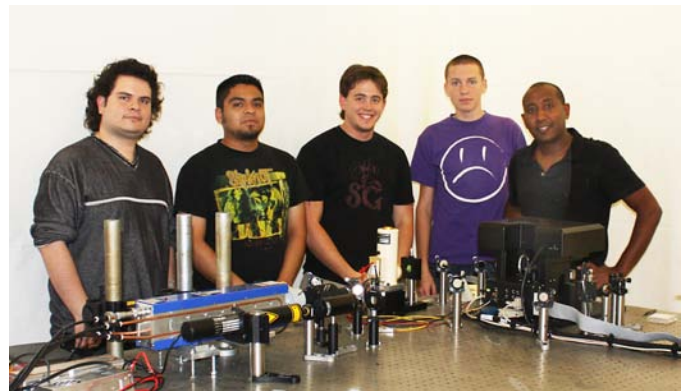
"Many new and exciting phenomena occur in nanometer ( $10^{-9}$  m) scale. However, it is difficult to study these phenomena using light, since we cannot focus light to such small dimensions using regular optical lenses due to a limitation imposed by diffraction of light. A technique called **apertureless near-field scanning optical microscopy (ANSOM)** can overcome this limitation and help us to illuminate only a very small region ( $< 20$  nm) so that we can study very small nanoparticles.

The overall scientific objective of my research is the development and application of near-field microscopy technique (ANSOM) to a variety of problems, such as plasmon-field imaging of metallic nanoparticles and chemically-specific spectroscopic imaging of semiconductors in the visible and infrared spectral regimes. A primary research focus is to study the *static and dynamic microscopic aspects of surface plasmons* in nanoscale structures and at interfaces. These research projects will advance our fundamental understanding of nanoscale plasmonics, the knowledge of which could enable new types of communication and photonic devices. "

Dr. Abate's laboratory provides an active learning environment for undergraduate and graduate students providing them with interdisciplinary skills. His research projects will extend the department's atomic force microscope (AFM) research and teaching a step further, by application of AFM not only to acquire topographical information but also to probe the optical properties of surfaces using ANSOM. This opens an excellent opportunity to students to learn about weak signal detection, signal processing, instrument interface to computers using software programs and other basic experimental skills that will make them an excellent match to any position in industry and academia.



Margaret and Yohannes Abate, and their oldest, daughter Alamael. Margret is an M.D. ("a *real* doctor").



Zachary Nuno, Jerry Ochoa, Brandon Hessler and Codi Bonney, in front of the approximately \$200,000 ANSOM setup that is just coming online.



## Dr. Prashanth Jaikumar Our Newest Theoretical Physicist

"Astronomy is the oldest of the physical sciences, practiced in one form or the other by the most ancient civilizations. My research addresses some of the key questions in modern Astrophysics and Cosmology: What powers fantastic astronomical events such as gamma-ray bursts and supernovae? How and where did the elements in the periodic table originate? What happens to the state of matter in the interior of neutron stars or black holes? I am looking forward to beginning an astrophysics initiative at CSULB at this exciting time, and especially involving undergraduate and graduate students in my research. I use a combination of theoretical ideas and computational techniques to answer these questions and pose new ones.

### **Techniques:**

- Field theoretic analytic techniques for quantum calculations of dense matter properties for applications in astrophysics
- Numerical simulations and modeling of astrophysical phenomena connected to neutron stars and nucleosynthesis

### **Broad Interests:**

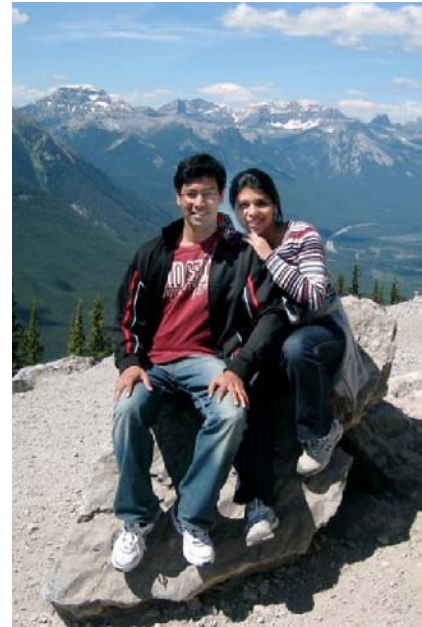
- Astrophysics of neutron stars, magnetic fields in dense matter, cosmic re-ionization, quark superconductivity.

"Currently, I am exploring phenomenological consequences of a novel superconducting phase of strongly-interacting matter in the interior of compact stars. The results provide a description of the phase structure of matter at high density that can affect observable properties of neutron stars such as their mass, radius and spin frequency."

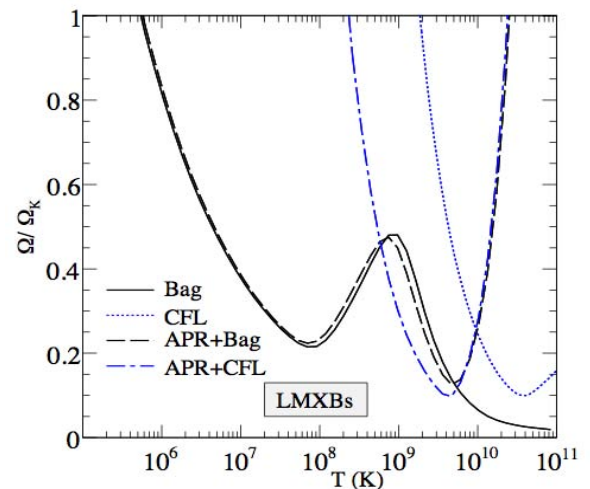
Dr. Jaikumar's research explores connections between phases of dense quark matter and astrophysical phenomena of neutron stars, using a combination of theoretical and computational tools. Currently, he is developing a formalism to study the gravitational wave signatures from neutron stars with quark matter cores.

He also works on simulating the nucleosynthesis of heavy elements from exploding compact stars, studies of vortex dynamics in superconductors and effects of magnetic fields in dense quark matter.

A related issue is the nucleosynthesis of heavy elements beyond iron, which requires a detailed understanding of stellar explosions and neutron star properties. In such extreme astrophysical environments, the complexity of the physics is handled by computer codes optimized to handle a nuclear reaction network. With his collaborators, he is working on developing codes that can describe nucleosynthesis in a dynamical situation of decompressing matter from neutron star crusts.



Prashanth and spouse, Deepali Bhandari in the Himalayas. Dr. Bhandari is a research associate at UC San Diego.



The critical frequency  $\Omega_c$  in units of  $\Omega_k$  as a function of temperature for neutron stars, strange stars and hybrid stars.

## Thomas Gredig Receives The National Science Foundation (NSF) CAREER Award

Dr. Thomas Gredig's materials research is aimed at the basic physics and properties of organic semiconductors with possible broad applications that include organic solar cells, gas sensors and organic thin film transistors. The current research investigates the magnetic interactions between nano-structured chains and new possibilities to enhance efficiencies in solar cells with self-assembled organic molecules.

Dr. Gredig received the prestigious **Faculty Early Career Development (CAREER) Award** from the National Science Foundation for five years for \$449,871. This award is given to faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research. The title of his award is *Morphology Control to Build 3D Magnetic Nanostructures and Tune Organic Solar Cells*.

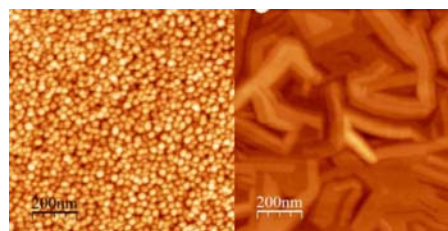
"The research is at the forefront of organic semiconductors," Gredig said when interviewed by the CSULB Grunion newspaper. "Our group is interested in understanding the structural, magnetic, and charge transport characteristics of thin films based on small organic molecules, such as metal phthalocyanine ( $M - C_{32}N_8H_{16}$ ). Our current research is funded by NSF to investigate the magnetic interactions between nano-structured chains and possibilities to enhance efficiencies in solar cells with self-assembled organic molecules."

Organic semiconductors have been used in the development of such technologies as OLEDs (Organic Light Emitting Diode), the organic relative of the LED (Light Emitting Diode). OLEDs can be used in television screens and MP3 players, among other applications.

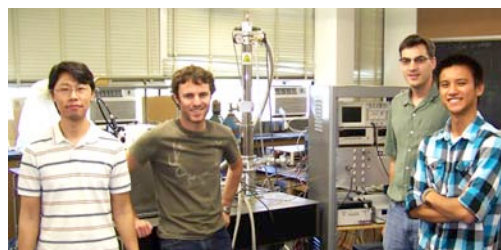
Dr. Gredig is also a very active Advisor to our *Society of Physics Students (SPS)* chapter, and has actively participated in the Physics Department's *Winter Undergraduate Physics Experience*, which has provided some of our newest first- and second-year undergraduate physics majors with carefully constructed, enriching problems and a very supportive environment. In addition, he has crafted new experiments for high schools and presented them to the Long Beach Unified School District's Advanced Science Institute workshop.



Standing in front of the thermal evaporator for thin film deposition of organic semiconductors in 2009 are Brian Cacha, Joshua Mims, Paul Gentry, Jorge Guerra, Daniel Bergman, and Professor Thomas Gredig.



Atomic force microscopy images of iron phthalocyanine thin films deposited at room temperature (left) and at 260 °C (right) under same conditions.



Summer, 2010: Jacob Kalmanir, Jorge Guerra and Brian Cacha with Professor Gredig. The machine behind Jorge is a closed-cycle refrigerator that allows setting the sample temperature in the range of 10 -

**CSULB SCHOLARLY AND CREATIVE ACTIVITIES AWARDS  
CONGRATULATIONS! SCAC Awards for AY 2009-2010**

Andreas Bill	Influence of the Grain Shape Anisotropy on their Distribution in Crystallization Processes	Assigned Time
Thomas Gredig	Quasi One-Dimensional Magnetic Chains in Iron Phthalocyanine	Summer Stipend
Chuheee Kwon	Physical Characterization of Gold Nano-Island Films	Assigned Time
Zoltan Papp	Study of the Alpha-Nucleon Interaction in Berillium_9 and Boron_9 Nucleus	Summer Stipend

*This has been an important source of internal support for faculty, which, for 2010-11 for budgetary reasons, has unfortunately been temporarily suspended.*



**Dr. Hooshang Tahsiri** has been with the Department for almost thirty years and teaches a full load of classes. His recent accomplishments in research include four patents related to fusion, the last two in 2008: *Magnetic and Electrostatic Confinement of Plasma with Tuning of Electrostatic Field*.



**Professor Emeritus and former Chair Sema'an Salem** is a welcome visitor to the Physics Department Office every week, where he shares many varieties of fruit from his backyard garden, good jokes, and good cheer. He has written several books since his retirement, and continues to write another.

**FACULTY CHANGES We are sorry to see them go.**



**RETIRED in 2008: Kim Gordon**, an Astronomy Lecturer in the Department and author of the Astronomy Laboratory Manual, retired after the Spring, 2009 semester. The Department joins in recognizing Kim for his 25 years of excellent work teaching the introductory astronomy course and laboratory. The Department voted to give him emeritus status. His astronomy laboratory manual has been used in our laboratories for many years.

Two tenure-track-faculty members, **Mladen Barbic** and **Christian Bracher**, left us in AY 2008-2009. Both expressed their deep appreciation for their time at CSULB.

- **Dr. Mladen Barbic** was recruited away from us by a great offer from the Applied Physics & Instrumentation Group of the Howard Hughes Medical Institute at their Washington, DC research campus.
- **Dr. Christian Bracher** and his family relocated to the prestigious private Bard College in New York State, just outside of NYC.

## RECENT FACULTY SUCCESSES AND EXTERNAL FUNDING AWARDS

**Congratulations to Co-PIs **Chuheee Kwon and Galen Pickett** of our department and Prof. **Laura Henriques** of the Dept. of Science Education on their new award of from PhysTEC, **Physics Teacher Education Coalition!****



The Physics Teacher Education Coalition (PhysTEC) recently announced that it would fund five universities to develop their physics teacher education programs into national models. Awardees demonstrated a capacity for large increases in the number of physics teachers graduating from their programs, as well as strong departmental and institutional support for teacher preparation efforts.



Funding for these sites will begin in Fall 2010. PhysTEC is a joint project of the American Physical Society (APS) and the American Association of Physics Teachers.

**Physics Teacher Education Coalition (PhysTEC)**  
**\$287,000**  
**3 years (2010-2013)**

**Congratulations to **Yohannes Abate** for an award of approximately \$45,000 from **The Research Corporation** for a proposal titled:**



*Nanoscale Surface Plasmon Polariton Local Excitation and Focusing by Near-field Microscopy for High Efficiency Organic Photovoltaics*

The overall objective of the research program is to study properties of surface plasmon polaritons in nanoscale structures and efficient integration of plasmonics to organic photovoltaics. This will be accomplished by using the unique light-matter interactions of high resolution ( $< 15$  nm) apertureless near-field scanning optical microscopy in the visible and infrared frequencies.

**The Research Corporation**  
**\$45,000**  
**2 years (2010-2012)**

**Congratulations to **Andreas Bill!****

Dr. Andreas Bill has received a three-year Award NSF Condensed Matter and Materials Theory program for three years with the title:  
*Phase Coherence in Heterogeneous Nanostructures.*



**National Science Foundation (NSF)**  
**\$105,023**  
**3 years (2009-2012)**

**Congratulations to graduate student Sam Koshy and mentor Prashanth Jaikumar** for a **Fellowship award** from the **NASA Graduate Student Research Program at Jet Propulsion Lab (JPL)**. Sam Koshy will work at JPL and here at CSULB. It is noteworthy all other student NASA-JPL awardees are from PhD institutions; Sam is the only one from an MS-granting institution.

**NASA Graduate Student Research Program at Jet Propulsion Lab (JPL)**  
**\$30,000**  
**1 year (2010-2011)**

The title of the study is *Detection of Gravitational Waves from Quark Star Binaries using LISA*. Professor Jaikumar comments: "We will analyze the possibilities for detecting gravitational waves from in-spiraling binary neutron stars, where one or both of the binary components may be quark stars. We plan to use computational techniques from numerical relativity to study the Roche Lobe overflow and mass-transfer process during different stages of the in-spiral. The overall goal is to examine the possibilities for detecting the signal of quark star binaries using LISA." P. Jaikumar



**Congratulations to Thomas Gredig!**

Dr. Thomas Gredig has received a 5-year NSF Faculty Early CAREER Development Award: *Morphology Control to Build 3D Magnetic Nanostructures and Tune Organic Solar Cells*.

**National Science Foundation (NSF)**  
**\$449,871**  
**5 years (2009-2014)**

In the words of the NSF: "The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of the early career-development activities of those teacher-scholars who most effectively integrate research and education within the context of the mission of their organization."



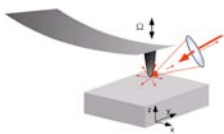
**Congratulations to PI (Principal Investigator) Chuhee Kwon of the Physics Department** and Co-PIs Jen-Mei Chang, Mathematics and Statistics, Lora Stevens-Landon, Geology, and Paul T. Buonora, Chemistry.

**National Science Foundation (NSF)**  
**\$593,450**  
**5 years (2009-2014)**

The project is titled *Ensuring Student Success in Physical Science and Mathematics NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM)*. This program supports scholarships for academically talented, financially needy students. The departments, and respective PIs, involved at CSULB are Physics, Chemistry, Geology, and Mathematics. The total number of scholarships based on need will be 8 the first year, and 16 for each of the following four years. The numbers are split between starting students, beginning courses for their intended majors, and Scholars, who have completed the introductory courses in the major.

**Congratulations to PI**

**Yohannes Abate** who has just received a grant of **\$50,000** for the two-year period from the ACS-PRF. The project is titled *Plasmonics in the Nano-Scale for High Efficiency Organic Photovoltaics*



**American Chemical Society  
Petroleum Research Institute  
\$50,000  
2 years (2010-2012)**

Very strong surface plasmon polaritons (SPPs) can be excited by near field techniques on metal surfaces at optical frequencies and on surfaces of doped organic semiconductors at low frequencies. These SPPs help us to concentrate and channel light using subwavelength structures on a sub-micrometric scale and could be used to enhance solar light absorption in ultrathin photovoltaic films. A significant part of this proposal is to explore the basic static and dynamic properties of subwavelength plasmonics on metal and highly doped conducting polymer surfaces for potential applications in photovoltaics. The results of the proposed research plan will have direct impact on our fundamental understanding of plasmonics. The projects will also provide an active learning environment to students.

**Congratulations to PI Andreas Bill and Co-PIs Zoltan Papp and Prashanth Jaikumar** for an award from the **Army High Performance Computing Research Center** for the following:

**Army High Performance  
Computing Research Center  
\$150,037  
1 year (2010-2011)**

The program will train participating UG and Graduate students in various approaches to computational thinking, programming, modeling, and visualization, and provide the skills, mentoring, and equipment that will allow them to be better prepared for technical challenges in the military, in industry, or in academia. Many of the students will work with mentoring faculty on research problems involving computational modeling and the use visualization techniques on a wide variety of research areas.



Z. Papp

This will involve the setup of a dedicated computational physics laboratory, development of a coherent curriculum for students to become proficient at solving problems using computation, and continuing mentoring of our students in faculty research projects allowing them to make significant contributions that lead to co-authorship on published articles in peer-reviewed journals.

**Congratulations to Professor Alfred Leung** for his funded proposal: *Increasing Visual Content in Physics Lab Instruction.*



**CSULB Enhancing  
Educational Effectiveness  
Through Technology Award  
\$2500 (2008-2009)**

## Report on Important Programs

### **WINTER SESSION UNDERGRADUATE PHYSICS EXPERIENCES**

Another very successful *Winter Program for Undergraduate Physics Experiences (UPE)* was carried out in January, 2009 and January 2010. This important successful program is aimed at **early recruitment and retention in our major**. This program provides students **very early in their physics studies, immediately after the introductory sequence of courses**, an early, intensive, quick introduction to the physics faculty and their research.

During the 3-week winter break between semesters, we match interested students from our introductory physics courses with faculty mentors who assign brief, 'do-able' projects. **The projects allow the students an early entry into the life of the Department and our research labs.** We are a relatively small department in a vital and necessary discipline, one that requires a strong effort at recruitment for majors. The students receive a stipend or an hourly wage to provide incentive during this period, during which they complete a project with a faculty member and meet other participating faculty members. *Winter Session Undergraduate Physics Experience* is

- a strong recruiting tool with real academic substance and
- hands-on experiences for students to allow them a reasonable basis for choosing a major, whether it is physics or not.

#### **WINTER SESSION 2009 UPE PROGRAM**

<b>FACULTY</b>	<b>UNDERGRADUATE STUDENTS</b>
Andreas Bill	ANTHONY HARTMAN
Thomas Gredig	DANIEL BERGMAN
Jiyeong Gu	SARAH GREFE
Chuheee Kwon	ALEXEI SARNA; BRIAN CACHA
Alfred Leung	JOHN CULBERTSON; PATRICK CHANG
Zoltan Papp	DIAA ELDANAF

#### **WINTER SEMESTER UPE 2010 PARTICIPANTS**

<b>FACULTY</b>	<b>UNDERGRADUATE STUDENTS</b>
Yohannes Abate	CODI L. BONNEY, BRANDON HESSLER, JERRY OCHOA
Andreas Bill	MATTHEW BYRNE
Thomas Gredig	JOSHUA REED
Prashanth Jaikumar	CALVIN MILLER, JILL PESTANA
Alfred Leung	ANDREW BAKER

**This program has shown itself to be a great opportunity for the students** and an excellent tool for student success and retention in the major.

A similar program reaches one or two physics UG students and provides invaluable experience for the participants: **SUMMER RESEARCH EXPERIENCES FOR UNDERGRADUATES.**

Providing opportunities for students to learn in faculty research labs during the summer can be an important factor in retaining prospective majors in the discipline of physics. A total of three students have so far been able to participate in 2009 and 2010 using \$2500 scholarships.

## **STOP HERE FOR A MOMENT!**

**Great programs are available to consider for your support/contributions.**

**Your support can be directed in ways that you wish.**

No state funds are used for scholarships or department events like the annual graduation party or for this newsletter. Students supported by scholarships, some of whom you see below and on the next page, all receive non-state funds that are contributed and are in accounts with the CSULB Foundation.

**You can contribute ONLINE at**

<https://karl.papubs.csulb.edu/giving/index.cfm>

- 1) *In the pull-down menu, which may read "Beach Fund (greatest need)", click on the up-down arrow to the right side and scan down to the end of the list to the College of Nat. Sci. and Math., then to **"Physics & Astronomy Department"**.*
- 2) *A Program title can be entered in the Comments box below the Physics Dept. designation. For example:*
  - **Winter Session UG Physics Experiences,**
  - **UG Summer Research Experiences**
  - **Scholarship Fund of the Physics Department,**
  - **Colloquia**
  - **Charles Roberts Scholarship Fund; Scalettar Scholarship Fund**
  - **General Funds for Department Needs,**

*Another way to discuss giving: talk to **Maryanne Horton**, Director of Development of the College of Natural Sciences & Mathematics, at **562-985-1687**.*

**Thanks very much for any help you can give! (Don't forget that many corporations will match donations of employees!)**



From left to right, for 2009: **Ioanna Dokas, Jorge Medina**, Richard and Florance Scalettar Scholarships, **Jesse Burgess and Samuel Pottish**, Philip Ord Johnson Scholarships, **Angela Marotta & Heather Stirewalt**, Scholarship Fund of Physics & Astronomy, and **Ariel Amberden**, John and Terry Milligan Scholarship



<b>Scholarships 2009-2010</b>	
<b>NAME</b>	
Culbertson, John	<b>Milligan Scholarship</b> (\$1000 Fall, renewable in Spring \$1000)
Lokovic, Kimberly	<b>Philip Ord Johnson Scholarship</b> (\$1000 AY)
Schrader, Min	<b>Philip Ord Johnson Scholarship</b> (\$1000 AY)
Christiansen, David	<b>Physics Dept Grad Summer Scholarship</b> (\$1000 AY)
Grefe, Sarah	<b>Physics Dept Grad Summer Scholarship</b> (\$1000 AY)
Thomas, David	<b>Physics Dept Scholarship Fund</b> (\$500 AY)
De Rojas, Julius	<b>Scalett Graduate Summer Scholarship</b> (\$2500)
Joshi, Toyanath	<b>Scalett Graduate Summer Scholarship</b> (\$2500)
Bergman, Daniel	<b>Scalett Scholarship</b> (\$1000 AY) \$500 Fall \$500 Spring
Burgess, Jesse	<b>Scalett Scholarship</b> (\$1000 AY) \$500 Fall \$500 Spring
Burgess, Jesse	<b>UG Summer Research Exp</b> (\$2500 from Provost)
Rave, David	<b>UG Summer Research Exp</b> (\$2500 from Provost)

<b>Scholarships 2010-2011</b>	
<b>NAME</b>	
Hessler, Brandon	<b>Milligan Scholarship</b> (\$1000 Fall, renewable in Spring \$1000); Physics Dept. \$500 Summer
Noah, Ramsey	<b>Philip Ord Johnson</b> (\$1000 AY)
Nuno, Zachary	<b>Philip Ord Johnson</b> (\$1000 AY)
Pestana, Jill	<b>Scalett Undergraduate Summer Scholarship</b> (\$1500)
Rawal, Shaina	<b>Scalett Undergraduate Summer Scholarship</b> (\$1500)
Bergman, Daniel	<b>Scalett Scholarship</b> (\$1000 AY) \$500 Fall \$500 Spring
Rave, David	<b>Scalett Scholarship</b> (\$1000 AY) \$500 Fall \$500 Spring
Ngo, Khuong	<b>Physics Dept Scholarship Fund</b> (\$250 AY)
Kalmanir, Jacob	<b>UG Summer Research Exp</b> (\$1500 Dept.; \$1000 Gredig)



Daniel Bergmann

Jill Pestana

Jacob Kalmanir

Shaina Rawal

**Recipients of scholarships for undergraduates, 2010-2011**

## Society of Physics Students CSU Long Beach Chapter

The Society of Physics Students (SPS) is a nationally recognized organization affiliated with the American Institute of Physics (AIP) and the American Physical Society (APS). The SPS web site is at [www.spsnational.org](http://www.spsnational.org).



The Department of Physics and Astronomy  
CSU Long Beach, Recognizes and Applauds

2009-2010

### The Society of Physics Students

CSU Long Beach Chapter #0823 of the National SPS

- ✿ DANIEL BERGMAN, PRESIDENT
- ✿ DAVID RAVE, VICE PRESIDENT
- ✿ JILL PESTANA, SECRETARY
- ✿ JOHN CULBERTSON, TREASURER
- ✿ THOMAS GREDIG, FACULTY ADVISOR

For Being an Active and Important Part  
of the Life of the Department.

The Faculty and Staff of the Department  
Thanks All Our Physics Students For Making the  
Department a Better Place for Everyone.

OUR BEST WISHES FOR CONTINUED SUCCESS!



Prof. Thomas Gredig, crouched in front  
at lower left, with 2009-2010, SPS  
president Daniel Bergman immediately  
behind him in the blue shirt.

The CSULB Chapter of SPS holds monthly meetings that provide a forum for the interaction of undergraduate students interested in physics or astronomy. The society meetings are also a good opportunity to take a break from the books, eat pizza, and develop collegiality on our drive-in urban campus.



**Professor Subhash Rajpoot** is the Liaison Officer for the **CERN (European Organization for Nuclear Research) Summer Internship program** run through CSU Fresno. Dr. Rajpoot was instrumental in sending two of our undergraduate students, **Adrien Atallah** and **Sarah McGovern**, both financially self-supporting, to spend 8 weeks at CERN during Summer, 2010. Founded in 1954, the CERN Laboratory sits astride the Franco-Swiss border near Geneva.

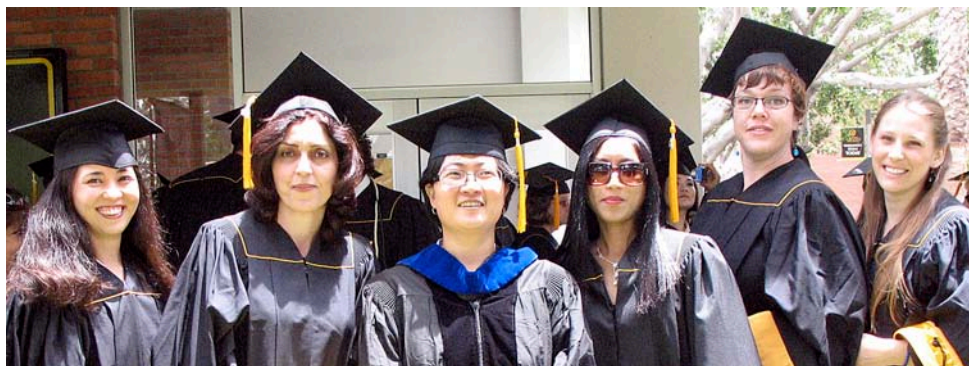
**Adrien, a physics major**, will be working on the ATLAS part of the LHC (Large Hadron Collider) and **Sarah, a communications major and physics minor**, will work on reporting and promoting the results at ATLAS. ATLAS is one of two general-purpose detectors at the LHC. It will investigate a wide range of physics, including the search for the Higgs boson, extra dimensions, and particles that could make up dark matter. ATLAS will record sets of measurements on the particles created in collisions—their paths, energies, and their identities.

## OTHER NOTABLE RECOGNITIONS



Erika Levenson, Kimberly Lokovic, Eren Karadayi, Russell Gleason, Julius DeRojas  
**Congratulations, 2010 AAPT Outstanding Teaching Associates!**

"The American Association of Physics Teachers (AAPT) is pleased to award you a one year membership in recognition of your outstanding teaching abilities. Your AAPT membership entitles you a choice of our premier print journals - the *American Journal of Physics* and *The Physics Teacher* as well as *Physics Today*. Your membership includes electronic access to all journals. You also qualify for free registration to our national meetings and member discounts."



Jennifer Imai, Fariba Allyasin, Dr. Kwon, Rosie Nawpar, Min Schrader, Erica Levenson  
**Congratulations to Graduate Advisor and Associate Chair Chuhee Kwon and all the 2010 graduates of the Department of Physics and Astronomy**

The Department nominated Dr. Chuhee Kwon for the *Provost's Award for Outstanding Faculty Mentor for Student Engagement in Research*. She is a research mentor to her own students and, as Graduate Advisor, has offered careful, clear encouragement and mentoring to all of our physics graduate students toward successful completion of their studies. The record number of MS degrees in 2010 is testimony to her successful accomplishment.