

# Department of Physics

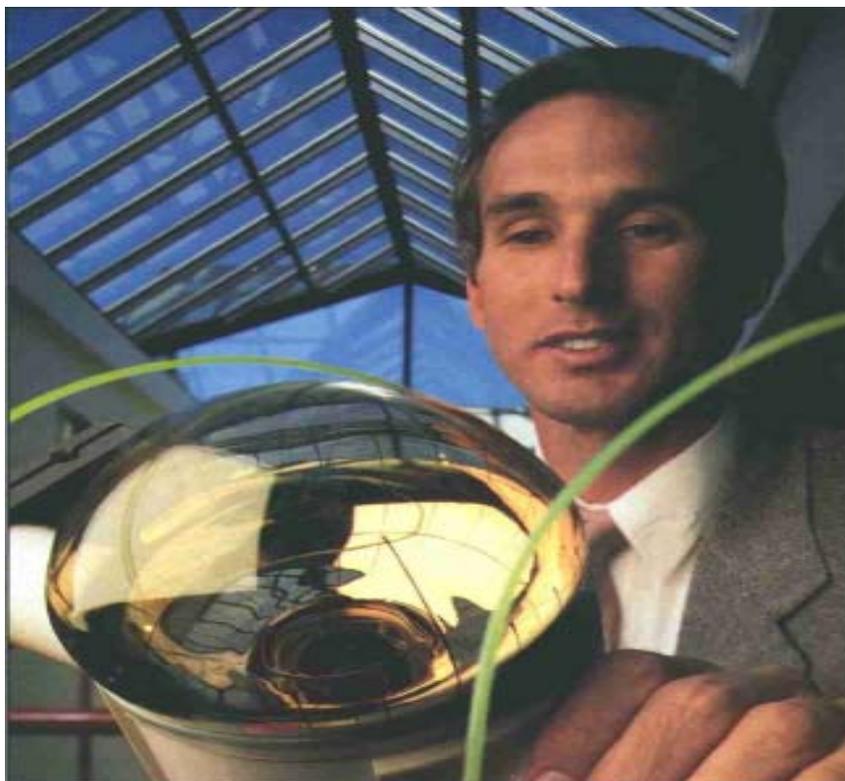
Vol. 1 No. 1 September 2003

# Alumni Newsletter

## Message from the Chair

Dear fellow Boston University physicists:  
It is a pleasure to bring you this Departmental Newsletter. Although many of you have long been away from the department, we hope that you remember your time here fondly. Through this newsletter, we hope to build community among our current and former students, faculty, and staff. It is therefore fitting that a major portion of this issue is devoted to an update on our former graduate students, compiled by Prof. Sid Redner. I would like to thank the many of you who responded to Sid's recent request for information; many respondents also kindly indicated their willingness to serve as resources of advice and wisdom to other students.

Since many of you may have lost touch with the department, I want to take this opportunity to tell you where we stand now, 17 years after I assumed the position of Department Chairman in 1986. I am grateful to Prof. Karl Ludwig for his assistance in preparing this update. We now have approximately 35 faculty members with primary appointments in physics and another dozen or so joint faculty members having primary appointments in other departments (e.g. astronomy, electrical engineering). We take great pride in our teaching mission, educating nearly 2,000 students each semester. Numerically, these are largely students in our introductory



**Larry Sulak at work**

courses, but we maintain strong undergraduate and graduate programs with enrollments of approximately 100 and 120 respectively. Our teachers have won major BU awards, including the Metcalf Cup and Prize (Prof. Kevin Smith), the Neu Family Award for Teaching Excellence (Prof. Rob Carey), the Methodist Society Teacher of the Year Award (Prof. Elizabeth Simmons) and the Gitner Award (Prof. Andy Cohen). Beyond the University, our faculty have won the NSF Distinguished Teaching Award and Prize (Prof. Eugene Stanley) and the Carnegie Foundation Massachusetts Teacher of the Year Award (Prof. Eugene Stanley and Prof. Kevin Smith).

Research is at the core of our department – it informs our

teaching, enables new technologies, and sheds light on our place in the universe. Our distinguished faculty includes 16 Fellows of the American Physical Society and 5 Fellows of the American Association for the Advancement of Science. The nearly 100 prizes and fellowships they have won include the Nobel Prize (Prof. Sheldon Glashow), the Bruno Rossi Prize of the American Astronomical Society (Profs. Jim Stone and Larry Sulak), the David Turnbull Prize of the Materials Research Society (Prof. Eugene Stanley), 10 Sloan fellowships, nine DOE Outstanding Junior Investigator awards, and 13 NSF Career/Presidential Young Investigator/POWRE awards. In addition, our graduate students have won

national prizes from the Materials Research Society and the American Vacuum Society in the past few years.

Objective measures of quality and productivity show how the department has grown during the last 17 years. Annual peer-reviewed research funding has risen from \$1.5 million to \$9.4 million. The number of refereed papers published annually by the department has grown from 70 to 230. Among the cohort of private university departments, we rank with the top ten over the period 1997-2002 in the number of papers (10<sup>th</sup>), the number of citations (6<sup>th</sup>), the citation impact (4<sup>th</sup>), and annual research funding (9<sup>th</sup>).

These achievements have been facilitated by the superb technical infrastructure built by the University. Our Scientific Instrumentation Facility is arguably the best of any university in the country. It constructed the first and only telescope at the South Pole and constructed most of the components of the *g-2* storage ring at Brookhaven, the world's largest and most accurate,

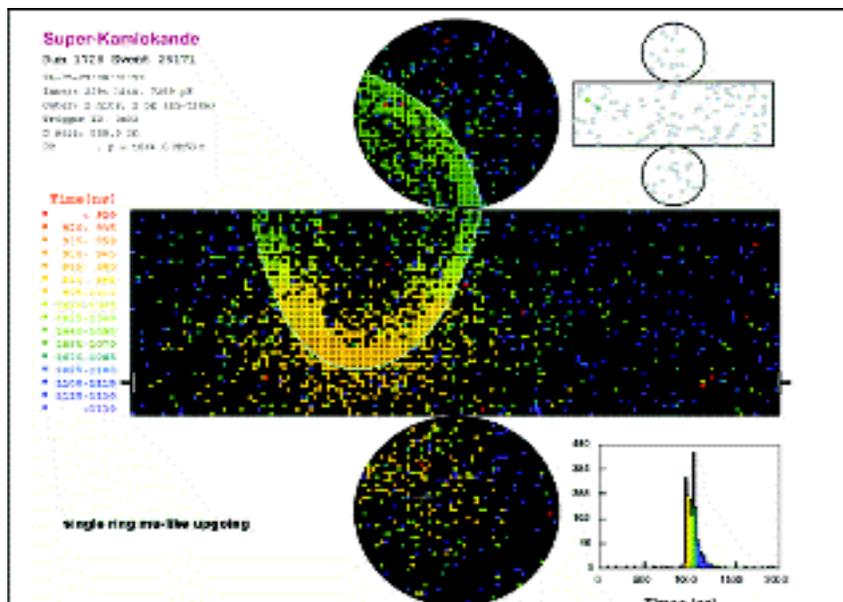
superconducting magnet. The Electronics Design Facility creates and produces state-of-the-art chips and circuit boards for the major forefront projects at Fermilab, Brookhaven and CERN, among many others. Our Center for Computational Science provides unparalleled computer power for faculty and staff.

In the area of particle physics, we are continuing to make national and international science news. On the *DØ* experiment at the Fermilab Tevatron, Profs. John Butler, Ulrich Heintz and Meenakshi Narain helped discover the last unknown quark – the heavy top quark. Meanwhile, the Neutrino Astrophysics Group (Profs. Ed Kearns, Jim Stone and Larry Sulak) played a major role in the Super-Kamiokande experiment, located in an underground facility near Toyama, Japan. Super-K, as it is known, conclusively showed that neutrinos oscillate from one flavor to another, and hence must have mass. This is the highest-cited particle physics experiment of all time. Another major impact on our fundamental understanding of the

nature of the universe may come from the *g-2* experiment of Profs. Rob Carey, Jim Miller, Lee Roberts and myself. This experiment at Brookhaven National Laboratory measured the gyromagnetic ratio of the muon, a sensitive probe of so-called Standard Model physics, to an accuracy of more than 1.3 parts per million. The experimental result, which suggests a discrepancy with the predictions of the Standard Model, received worldwide attention, with front-page announcements in the *New York Times*, *Boston Globe*, and *USA Today*. Meanwhile, Profs. Steve Ahlen and Jim Rohlf have been helping construct the next-generation collider physics experiments to be performed at the Large Hadron Collider (LHC) at CERN. These experiments seek to understand the origin of mass itself, possibly through the existence of the Higgs boson.

Complementing this strong program of experimental research, our particle theorists are exploring the most fundamental questions about nature. Prof. Claudio Rebbi is using the newest supercomputers to better understand how quarks and gluons interact. Profs. Andy Cohen, Sheldon Glashow, Ken Lane, and Martin Schmaltz are examining how electroweak and flavor symmetry breaking possibly work and how they might be better observed in future experiments. Meanwhile Profs. Cohen, Glashow and So-young Pi are examining how these issues affect cosmological questions such as “What is the nature of the dark matter and dark energy in the universe?” and “What mechanism produced dominance of matter over anti-matter in the universe?”

In condensed-matter physics, much of our recent focus has been on better understanding and exploiting physics at the nanoscale. Prof. Bennett



**A** graphical event display, developed at Boston University, of the sort of neutrino interaction that the Super-K group used to demonstrate that neutrinos have mass.



**The g-2  
superconducting  
ring at  
Brookhaven**

Goldberg is using novel near-field optical microscopy and spectroscopy techniques in the Photonics Center to examine systems ranging from synthetic quantum dot arrays to streptavidin molecules. His work is related to the research of one of our newest faculty members, Prof. Raj Mohanty. Mohanty is fabricating and studying nanodevices in order to better understand quantum mechanical coherence and materials behavior on scales where quantum mechanics plays a vital role. Prof. Rama Bansil arrives at nanoscales from another perspective – via synthetic and biological macromolecules. Her group uses light scattering and microscopy to understand phase transitions that can produce novel morphologies in these systems. She is collaborating with Prof. Karl Ludwig, whose group uses synchrotron-based x-ray scattering to better understand the evolution of atomic structure in materials. Currently, they are constructing a major new ultra-high vacuum facility with Prof. Ted Moustakas (ECS/Physics) for real-time x-ray studies of materials processing at the National Synchrotron Light Source at Brookhaven. Prof. Kevin Smith's group is also

utilizing this synchrotron radiation source for soft x-ray spectroscopy and photoemission studies to better understand the electronic structure of novel materials. Novel structure and dynamical behavior also continue to be the focus of the surface He-scattering group led by Prof. Michael El-Batanouny.

We're also proud to continue our long standing strength in statistical mechanics theory (Profs. Bill Klein, Sid Redner and Eugene Stanley). The breadth of topics on which they've made significant impacts is impressive. Klein has been applying concepts from phase transition kinetics to understand and predict earthquakes. Redner is developing new approaches from non-equilibrium statistical physics to determine the kinetics of chemical reactions and to unravel the structure of growing networks. Stanley's group has been making pioneering contributions in the new discipline of "Econphysics" (his book on the subject recently appeared) and furthering our understanding of phase transitions in supercooled liquids, particularly liquid water. Complementing this strength is an outstanding new group of quantum condensed matter theorists (Profs. Antonio Castro-

Neto, Chamon and David Campbell). Campbell, formerly the physics department chairman at the University of Illinois-Urbana/Champlain, is now the Boston University Dean of Engineering. This group is seeking to understand the novel states of matter that arise in strongly correlated electron systems.

With the increasing national emphasis on biological sciences, our biophysics effort remains strong. Prof. Shyamsunder Erramilli is using near-field infrared microscopy to reveal the inner workings of cells in unprecedented detail, while Prof. Ken Rothschild is developing techniques for modifying membrane proteins at the molecular level. Bansil continues to play a large role in our biophysics research.

In conclusion, the last 17 years have been a remarkably productive period. The potential of this new millennium is excellent. We hope that you stay in touch and share the excitement of your careers with us, as we share the continuing progress here in your department.

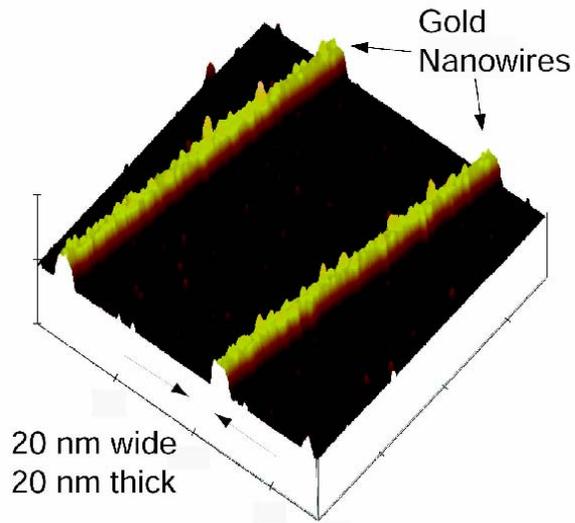
**Best Wishes, Larry**

# Two Recent Research Highlights

## Nanoscale Physics is a Big Hit

To provide a sense of the recent excitement in the departmental research programs, we are highlighting the work of two groups. The first discusses recent advances in nanoscale physics in the research group of Prof. Raj Mohanty. The second outlines the effort to understand so-called “neutrino oscillations” conducted by the BU contingent at the Super-K experiment. Science and technology on nanoscales (i.e. size scales on the order of  $10^{-9}$ - $10^{-8}$  m) is increasing in importance. The University has made large commitments in this area in the past five years, including the hiring of a new faculty member in physics, Prof. Raj Mohanty. The primary goal of Mohanty’s group, which is closely tied with Prof. Bennett Goldberg and Prof. Bill Skocpol, is the exploration and exploitation of quantum mechanical effects in engineered nanoscale systems with both electronic and mechanical degrees of freedoms. The group’s focus can be divided into several areas:

**Scanning electron micrograph of gold nanowires used for the measurement of quantum interference effects and quantum conductance distribution to test the conventional theories of low-dimensional metals.**



### **Nanoscale Electronic Systems**

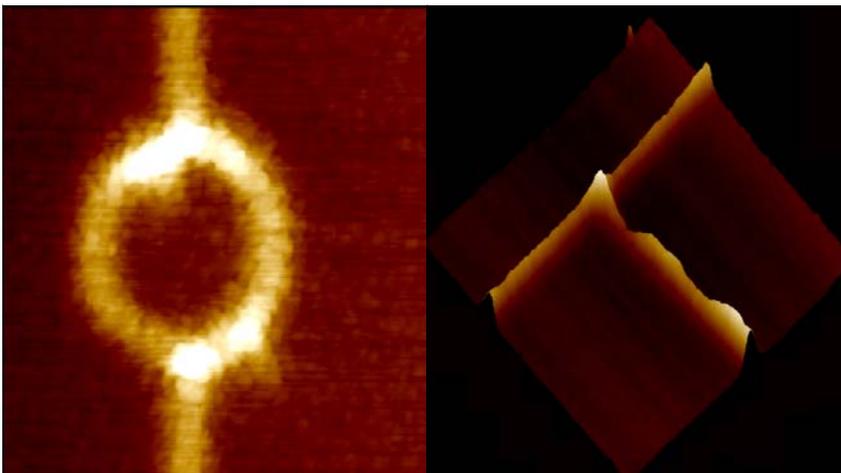
Quantum mechanics is characterized by two essential properties: coherence and spin. Coherence manifests itself in interference effects when the system size becomes small or comparable to a length scale, known as the quantum decoherence length, over which coherence is maintained. At extremely low temperatures (in

the range of few millikelvins), the coherence length is typically on the order of microns. This is the reason why research in this area involves ultrasmall nanoscale systems and ultralow millikelvin range temperatures.

Studies of decoherence of a single quantum-mechanical degree of freedom are important to the engineering of solid-state-based, single-spin quantum bits for quantum information processing. Prof. Mohanty’s research is drawing upon the advances and insights of his recent experiments on electron decoherence and other coherent effects involving the charge degree of freedom, such as persistent currents, Aharonov-Bohm oscillations, and conductance fluctuations in phase-coherent systems.

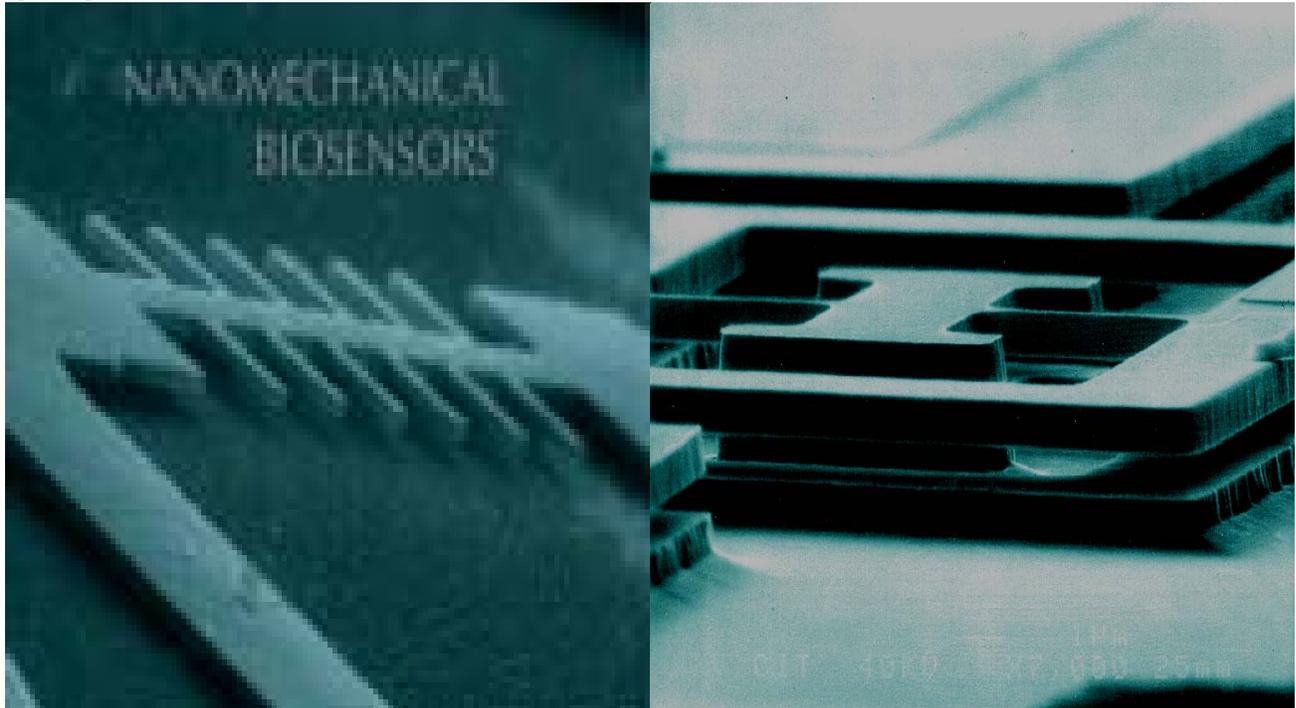
### **Micro- and Nano-Mechanical Systems**

Properties of physically engineered micromechanical (MEMS) systems are of immense fundamental and technical interest. Some recent examples of micromechanical structures include vortex motion in high- $T_c$



**The pictures depict a nano-junction and an Aharonov-Bohm ring of YBCO fabricated by a chemical-free process to preserve the superconducting transition. The samples were nanofabricated with the use of electron-beam lithography.**

**M**icromachined mechanical structures like the ones shown here allow the measurement of very small forces with unprecedented sensitivity. The design of the micromechanical structure depends on the type of force and the environment. A prototype biosensor with an antenna structure, shown here on the left, can have a typical prong size of 50 nm. More complicated torsion oscillators like the one shown on the right enable the measurement of ultra-small spin dependent forces.



superconductors, actuation of sensors via the Casimir force, and shuttling of electron charge in a quantum dot. Important to these experiments is the oscillation of a particular or a set of micron-sized resonators at a resonance frequency determined by the geometry and material properties. Changes in the resonant oscillation frequency or the oscillation amplitude mostly determine the magnitude of the force coupled to the micromechanical structure. Detrimental to the detection of force is the damping of the resonant structure, quantified by quality factor  $Q$  or dissipation  $1/Q$ . In recent experiments by many groups, including Prof. Mohanty's, it has been shown that quality factors of micron- and nano-sized mechanical structures fabricated from silicon and GaAs single crystals could be as high as 20,000 below 4K, too small compared to the quality factors in cm-sized or larger structures.

However, these structures in the micron scales have very high force sensitivities (in the sub-femtonewton range), enabling the measurement of sensitive fundamental forces. It is becoming increasingly clear that MEMS structures at extremely low temperatures can be used as force sensors in a number of applications. Prof. Mohanty's group is currently working on devising MEMS detectors for the measurement of the electron spin-flip process in nanoscale structures, in vitro biomolecular recognition, and the gravitational force in micron distance scales.

#### **Nanoscale High-Temperature Superconducting Devices**

The microscopic mechanism of high-temperature superconductivity is an outstanding problem in condensed matter physics. In spite of intense theoretical and experimental efforts over the last fifteen years, the underlying mechanism is yet to be recognized. At BU, Prof.

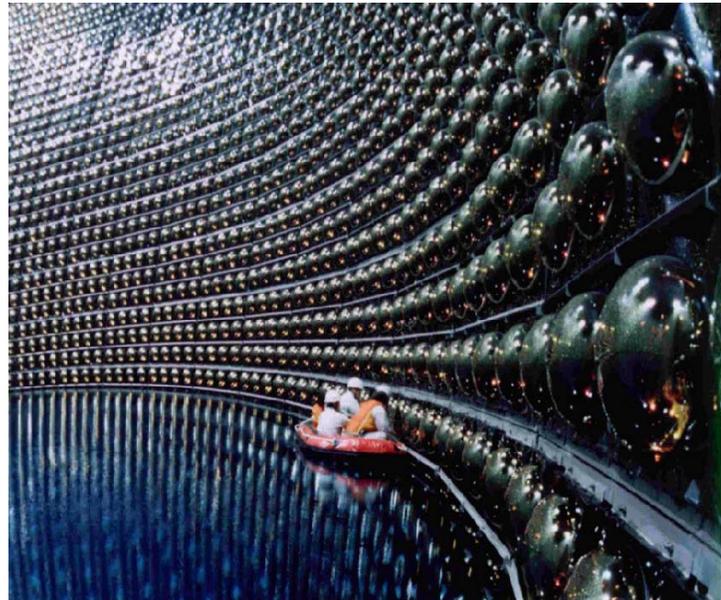
Mohanty's approach to the problem involves the realization that most of the physical length scales in high temperature superconductivity in copper oxide materials are in the sub-micron or nanometer scale. These include the coherence length, stripe length scales, the penetration depth, the lattice spacing and the grain size. Currently, Mohanty's group is studying high-temperature superconducting devices with sizes in the nanometer range. Their primary interest is to study fundamental mechanisms, such as Anderson's RVB (Resonant Valence Bond) theory and the recently-proposed Z2-gauge theory of Fisher in which spin-charge separation of the charge carriers result from electron fractionalization. Mohanty expects his experiments to find the magnitude of the charge ( $e$  or  $2e$ ) in the charge carriers in the underdoped regime of the phase diagram.

## Neutrinos Reveal their Long-Kept Secrets

For many years, neutrinos were among the least understood elementary particles. They interact minimally with ordinary matter (traveling through the entire Earth with only a small chance of interaction) and it was assumed that they were massless. Even their name, meaning “little neutral one,” is diminutive. The BU neutrino physics and particle astrophysics group of Prof. Ed Kearns, Prof. Jim Stone and Prof. Larry Sulak, however, have helped to change our picture of neutrinos dramatically. Their achievements rely on the use of a detector (Super-Kamiokande, or “Super-K” for short) in an active zinc mine underneath the Japanese “Alps;” the detector comprises 50000 tons of water that are viewed by 11000 photomultiplier tubes. The large mass of water acts as a source of protons for the study of proton decay as well as a target for neutrino interactions. The first experiment performed by the group, in the mid-1990’s used natural sources of neutrinos: from nuclear reactions in the sun, and cosmic rays originating beyond the Solar System. The collaboration found evidence that neutrinos change from one flavor (electron, muon or tau) into another as they travel from the



**Location of the Super-K, KEK and J-PARC experiments**



**The interior of the Super-K detector**

source to the target. This behavior is understandable if neutrinos have very small, but non-zero masses, which had not been the usual picture in the Standard Model. Mark Messier, now an assistant professor at University of Indiana, studied this effect in cosmic ray neutrinos in his 1999 thesis; the resulting paper is now the most heavily cited experimental particle physics publication.

To confirm the flavor change, a second and very different experiment has been devised. KEK to Kamiokande (“K2K”) is using a beam of neutrinos created at the KEK accelerator laboratory, 250 km from the Super-K detector. This effort is being spearheaded by BU research professor Chris Walter. Preliminary results indicate that neutrino flavor change is happening in a way similar to cosmic ray neutrinos. When they undergo this change, the muon neutrinos seem to disappear from the beam. The K2K experiment is now at the midway point, while the original Super-K experiment continues (solar and cosmic ray neutrinos are free after all!).

A third generation experiment, which is now being planned to run in 2008, will use a new and more intense accelerator beam being constructed at a new facility in Japan called J-PARC. This will allow a very high precision measurement of muon-tau flavor mixing, addressing the theoretical question of whether the mixing is really full strength or slightly less. But the most important goal is to determine the role of the electron neutrino. According to Prof. Kearns, if there is any mixing of muon and electron flavors, it must be fairly small. This new experiment will be able to study mixing strengths as small as one percent. If the experiment operates as designed and nature cooperates, this would likely be the first ever observation of a neutrino flavor “appearance” in a beam of another flavor. Such confirmation of the earlier Super-K and K2K results would require changing our view of the particle physics Standard Model and may also significantly impact our understanding of mass density in the universe and how it relates to universe expansion.

# Class Notes

We are extremely proud of the varied and significant achievements that many of you have attained both in the physics profession and beyond. A substantial number of you have written compelling narratives about your careers in education, medical applications of physics, finance, public policy, and many more interesting areas. There is also a considerable number of you who have had great success in academic physics careers.

In keeping with the inclusive spirit for a first alumni newsletter, the following "class notes" contains information that we've received in response to our initial contacts with you, the alumni. We hope that you will enjoy learning about the careers of your classmates and other alumni of the Boston University physics graduate program.

Please keep us informed of your careers; we are grateful to hear from you! As you can see, our records become progressively less complete going back in time. If you have contact leads or information about missing alumni, please let us know.

## 2003

### **Palash Banerjee Ph.D.**

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Palash is currently a post-doctoral research associate at Ohio State University.

### **Ahmet Ozcan, Ph.D.**

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Ahmet is a postdoctoral research associate in the Physics Department at Boston University. His current research focuses on the real-time x-ray studies of materials during processing (plasma etching and film growth). While writing his doctoral thesis on titanium silicide thin films, Ahmet spent three summers at the IBM T.J. Watson Research Center focusing on in-situ studies of phase transformations in silicide thin films. He was recipient of the 2000 Goldhaber Award from the Boston University Physics Department. In 2002, he was honored with the American Vacuum Society and Materials Research Society Graduate Student Awards.

### **Prashant Sharma, Ph.D.**

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Prashant is currently a post-doctoral research fellow in the Laboratory for Solid State and Atomic Physics at Cornell University. About his graduate experience, Prashant writes: "After completing my undergraduate education in India, I came to Boston University for a Ph.D. in physics. There I became interested in problems in condensed matter physics involving quantum effects in low dimensions. After an initial brush with field theory applications to quantum magnetism, I turned to less esoteric issues, amenable to experimental studies, in the field of mesoscopic physics. For my Ph.D., I worked on transport, especially spin transport, in electronic structures confined in two dimensions -- quantum wires. After graduating, I have taken up a postdoctoral position at Cornell where I work on related themes in quantum wires and in three-dimensionally confined chaotic cavities -- quantum dots."

### **Josh Turner, M.A.**

After receiving his M.A. degree, Josh transferred to the University of Oregon to continue his Ph.D. studies.

### **Eric Waldron, Ph.D.**

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After defending his thesis in experimental condensed-matter physics in late 2002, Erik was hired as a senior member of the technical staff at Draper Lab in Cambridge, MA. Draper Lab is an independent not-for-profit laboratory serving the national interest. After six months, Erik became a permanent member at Draper and joined a solid-state sensor group, consisting of condensed-matter physicists, material scientists, electrical engineers, and mechanical engineers. Erik writes, "The group is geared towards research on solid-state sensors for space-based applications. Our group is at the cutting edge of solid state imagers and the research is both fun and challenging. My knowledge of condensed-matter physics and device physics from BU course work, and my own re-

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search, has been extremely beneficial to me at Draper and I really look forward to learning more here."

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## Masako Yamada, Ph.D.

myamada@nycap.rr.com

"I started working at the GE Global Research Center in September 2002, a week after my defense," Masako said. "In spite of my thesis in statistical mechanics, I was placed in the Applied Optics Lab, where I must wrestle with lasers and lock-in amplifiers. Actually, I'm considered a simulation expert, and I've been doing light scattering simulations. I like it here, where 1) deadlines come fast; 2) you're responsible for affecting the bottom line; 3) teamwork is part of what you get paid for; and 4) coffee breaks are short."

# 2002

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## Mete Atature, Ph.D.

Mete earned his Ph.D. under the supervision of Prof. Alexander "Serge" Sergienko at the College of Engineering Quantum Imaging Laboratory in the College of Engineering. Now he is working at ETH as a postdoctoral fellow under Professor Atac Imamoglu at the Quantum Photonics Group in Zurich.

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## Emilia La Nave, Ph.D.

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Emilia is currently a postdoctoral researcher at the University of Rome, where she continues to work on the kinetics of glassy systems.

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## Kevin Lynch, Ph.D.

krylnch@bu.edu

After undergraduate work at MIT, Kevin joined the High Energy Theory Group in 1998, under Prof. Liz Simmons. He married his college sweetheart, Candace, in July of 1999. He defended his Ph.D. Thesis ("Technimesons and Weak Gauge Bosons in Dynamical Models of Electroweak Symmetry Breaking") in April of 2002, and then switched concentrations to Experimental Particle Physics when he joined the Intermediate Energy Group as a postdoctoral fellow. Kevin is currently working on the Muon Lifetime Analysis (MuLan) and Muon Nuclear Capture (MuCap) experiments at the Paul Scherrer Institut in Villigen Switzerland. MuLan hopes to measure the lifetime of the positively charged muon to one ppm, and extract the Fermi Constant at the same level, while MuCap hopes to measure the proton's muon capture cross section to a fraction of a percent, and extract QCD weak nucleon form factors to a few percent.

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## Marko Popovich, Ph.D.

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According to our latest information, Marko is working at the artificial intelligence laboratory at MIT.

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## Tonguc Rador, Ph.D.

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After completing his Ph.D. in elementary particle theory, Tonguc became a postdoctoral fellow at the Feza Gursey Institute in Istanbul, Turkey. Currently he is the Network/System Administrator there.

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## Antonio Scala, Ph.D.

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Although we have not heard from Antonio directly, we understand that he is currently a postdoctoral researcher at the University of Rome, where he is researching kinetics of non-equilibrium statistical systems.

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## Victor Spirin, Ph.D.

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After graduating from BU, Victor joined the Computational Biology Lab at the Health Sciences and Technology division at MIT. He focuses on research involving the computational discovery of clusters of proteins -- protein complexes -- in protein-protein interaction networks, and the discovery of metabolic modules and pathways in metabolic maps. As a graduate student, he was involved in studying non-equilibrium Ising spin systems. "These are systems which have been studied for decades and yet it's amazing how much interesting behavior has yet to be discovered," Victor wrote. He found that when quenched from a high temperature disordered state to zero temperature, this system freezes into complex metastable states both on regular lattices and on random graphs.

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## Jeff Tollaksen, Ph.D.

Jeff received his Ph.D. under visiting professor Yakir Aharonov, studying fundamental issues of quantum mechanics.

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## Alexei Trofimov, Ph.D.

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Alexei is currently a research fellow in the Department of

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Radiation Oncology at Massachusetts General Hospital, a technique which may lead to substantial improvements in radiation therapy of cancer and the patients' quality of life, by improving the sparing of the healthy tissue surrounding the tumor," Alexei wrote. "My duties also include clinical tasks, such as treatment planning and quality assurance for cancer therapy. I have recently published a paper in *Physics in Medicine and Biology*. Three other papers, to which I contributed, have been submitted to Radiation Oncology journals in the US and Europe. I fondly remember my grad school years at BU, and I would like to thank and send my best wishes to everybody in the Physics Department."

## 2001

### **Gabriela Bunea, Ph.D.** gbunea@att.net

After working at the Institute of Microtechnology, Bucharest, Romania and the Institute of Applied Physics, Bern University, Switzerland, developing MEMS (micro-mechanical systems) for pressure sensors and Er-doped fiber lasers for medical applications, Gabriela came to BU for her Ph.D. in physics. During her thesis work, she developed a time-resolved photoluminescence system and used it to study local properties in GaN and alloy materials, and InGaAs self-assembled quantum dots. Gabriela joined Lucent Technology Microelectronics Division as a member of technical staff, developing characterization techniques

for InP/InGaAs avalanche photodetectors and device design. In January 2003, she then joined SunPower Corporation, as a R&D engineer, working on high efficiency mechanically stacked GaAs/Si concentrator solar cells. She is the author of 13 papers and conference proceedings.

### **Parameswaran Gopikrishnan, Ph.D.**

Last we heard, Gopi had taken his expertise in statistical physics to Wall Street. He is working as a financial analyst at Goldman-Sachs on Wall Street.

### **Wonmuk Hwang, Ph.D.** hwm@yogi.mit.edu

Wonmuk is currently a post-doctoral fellow at the Center for Biomedical Engineering at MIT. His current research is focused on biological systems, especially on biomolecular self-assembly and cell mechanics, mainly using computational approaches in combination with experiments.

### **Haris Kudrolli, Ph.D.**

Haris now works as a physicist with former BU professor Bill Worstell's company - PhotoDetection Systems. "We are in the process of building a PET/CT (Positron Emission Tomography / XRay Computed Tomography) system to detect for cancer in patients," wrote Haris. "PET/CT has recently become an important imaging modality." Now privately owned, PhotoDetection Systems, Inc. (PDS) was founded at Boston University's Photonics Center in

1998 and has since developed proprietary detection systems for high-performance PET, a rapidly growing medical diagnostic imaging modality. PET scanning is an excellent tool in the diagnosis and management of cancer, especially in detecting early-stage tumors and determining tissue characteristics before and after treatment.

### **Alison Loewy, M.A.** Aloewy@njhs.org

Ali decided that a career in education was more to her liking and left our graduate program after two years to pursue teaching and is now the physics teacher at the New Jewish High School in Waltham, MA. Ali writes, "I absolutely love teaching high school. This year I am teaching conceptual physics, advanced physics and math. The advanced physics class is wonderful - they really keep me on my toes! If you ever have grad students there who are interested in teaching high school, you can feel free to give them my e-mail address. I would be happy to talk to them."

### **Hans Robinson, Ph.D.** hansr@ee.ucla.edu

Currently Hans is a post-doctoral fellow at UCLA. He would be happy to act as a contact for BU physics students and alumni.

### **Gokhan Ulu, Ph.D.** ulu@clarendonphotonics.com

Currently Gokhan works for Clarendon Photonics, a company that produces integrated optics for the telecommunications industry. "Of course, given the market, who knows where I will be in the

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following years or even months," Gokhan said. He is open to being contacted by graduates seeking opinions, suggestions and perspective for their future paths.

## 2000

### **Marius Bunea, Ph.D.**

[mbunea@sunpowercorp.com](mailto:mbunea@sunpowercorp.com)

Marius began working recently for Sunpower in Sunnyvale, CA, where his wife, Gabriela Bunea, is also employed. The company "makes solar cells and photodiodes on silicon. My job is to make photodiodes," Marius said. "Everybody is very nice and they have a lot of work for me. I am really glad that it worked out."

### **Somalee Datta, Ph.D.**

For her thesis, Somalee studied the behavior of porous media when fluid carrying particulate matter flows through the media. "We showed the analytical behavior of clogged particle density and time to clogging on a simple network that we called the "bubble model" and did simulations on more complex networks," wrote Somalee. She misses the other postdoctoral fellows and students in her group. "Afterall, we spent enormous amounts of time back to back in our small office, working, sharing stories, and drinking gallons of espresso!"

Somalee started working as an R&D Engineer for Advanced Rendering Technology, a company that makes a specialized 3D rendering (ray tracing)

graphics processor. She was part of the small team developing the core software engine. Somalee's projects include writing multi-dimensional Monte Carlo integrator for smart smapling of 3D scenes, modeling the ray tree, and writing algorithms to manage the parallized computation on the chips. Recently, Somalee moved to a bioinformatics startup that hopes to enhance computational power available to drug design, making it easier, faster, and cheaper to place new drugs on the market. There, Somalee writes optimization algorithms, studies interaction energy of disease and drug relevant proteins, and learns about disease pathways in rats. Somalee is willing to be contacted with questions regarding the industry or [about Silicon Valley](#).

### **Matthew Earl, Ph.D.**

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Matt is currently an Assistant Professor in the Department of Radiation Oncology at the University of Maryland School of Medicine in Baltimore. "My primary duties include providing the physics support at one of the University of Maryland Medical System's satellite locations, North Arundel Hospital in Glen Burnie, MD," said Matt. "In addition to my clinical responsibilities, I am actively involved in research in the field. In particular, we are developing a novel technique to improve the treatment of cancer patients whereby the radiation dose to the malignant tumor is maximized while minimizing the dose to normal surrounding organs and tissue. This work has resulted in several articles published in peer reviewed journals ([Medical](#)

[Physics](#), [Physics in Medicine and Biology](#)) and has a patent pending. We also have a licensing agreement with a commercial treatment planning company, Prowess, Inc."

### **Ivo Grosse, Ph.D.**

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Ivo is currently a Cold Spring Harbor Association Fellow at Cold Spring Harbor Laboratory, working in the field of bioinformatics. He is glad to act as a resource for graduates.

### **Vidya Madhavan, Ph.D.**

[madhavan@bc.edu](mailto:madhavan@bc.edu)

Vidya is currently an Assistant Professor of Physics at Boston College, after a very successful postdoctoral position at the University of California, Berkeley in Prof. Michael Crommie's research group.

## 1999

### **Wei Chen, Ph.D.**

[weichen@caltech.edu](mailto:weichen@caltech.edu)

Our last information is that Wei had a postdoctoral position at Caltech in 2000.

### **Michelle Corte-Real, M.A.**

[drcr02@yahoo.com](mailto:drcr02@yahoo.com)

Michelle transferred from our graduate program after 1999 and she is about to defend her Ph.D. thesis at the University of Delaware. Starting November 1st, she will be a research physicist for a company called Materials Modification Inc. in Fairfax, VA.

# Class Notes

## **Nikolay Dokholyan, Ph.D.**

dokh@med.unc.edu

Nikolay spent several years as a postdoctoral fellow in the chemistry department at Harvard and is currently an Assistant Professor in the Department of Biochemistry and Biophysics at the University of North Carolina, Chapel Hill. "We use theoretical and computational methods to study the nature of physical interactions between amino acids in proteins," said Nikolay. "Understanding these interactions can shed light on the function of proteins and how they interact with other macromolecules in the larger context of the cell, and ultimately the organism. We are also interested in the implications of this work to protein engineering and molecular evolution."

## **Gary Garber, M.A.**

Gary\_Garber@buacademy.org

Gary is currently the physics instructor at Boston University Academy, an elite private high school under the auspices of Boston University.

## **Oana Malis, Ph.D.**

Currently Oana is working at Lucent Bell Labs after having a postdoctoral position at Cornell University and working at IQE Inc., a company that manufactures and develops chips for telecommunications.

## **Michael Manfra, Ph.D.**

manfra@lucent.com

Mike is a technical staff member at Bell Laboratories, Lucent Technologies. His research

focuses on the MBE growth and transport studies of the wide-bandgap semiconductor GaN.

## **Mark Messier, Ph.D.**

messier@indiana.edu

Mark spent three years as a postdoctoral fellow at Harvard after graduating and is now an Assistant Professor at Indiana University, Bloomington. He would be glad to talk with students about life as a graduate student, physicist, or whatever.

## **Reza M. Sadr-Lahijany, Ph.D.**

Last we heard, Reza was working in the Boston area for EMC Corporation, a major manufacturer of data storage devices.

## **Francis Starr, Ph.D.**

fstarr@wesleyan.edu

Following graduation, Francis became a National Research Council postdoctoral fellow at the National Institute of Standards and Technology (NIST). After four years at NIST, he was appointed Assistant Professor of physics at Wesleyan University in Middletown, CT. On a personal note, he married to Radostina Koleva in 2001.

## **Greg Vander Rhodes Ph.D.**

gregvr@ahuracorp.com

For Greg's thesis work for his degree in physics, he used Near-field Scanning Optical Microscopy (NSOM) to study guided-wave and photonic-crystal devices. After

graduation, Greg joined a startup company, CoreTek. He contributed to the design and development of an optically-pumped Micro Electro-Mechanical System-based tunable laser module. This is a tiny laser where one can move the output mirror an infinitesimal amount, thus changing the resonance wavelength, and ultimately changing the emission wavelength. After Nortel Networks acquired CoreTek in 2000, Greg served as Principal Design Engineer, introduced three optoelectronic modules, and was involved in designing and building initial prototypes, and in assisting in the transfer to full-scale manufacturing. Last year, he left Nortel Networks to join Ahura Corporation, currently serving as Principal Optoelectronic Packaging Manager. Greg lives in Melrose, MA with his wife Chris and their new son Peter.

# 1998

## **Bhashyam Balaji, Ph.D.**

Bhashyam.Balaji@drdc-rddc.gc.ca

Bhashyam is a Defense Scientist for the Canadian Department of National Defense, working on airborne radar signal processing. He completed a second Ph.D. degree in electrical engineering during the summer of 1999 and is now a Canadian citizen.

## **Gian Franco Bonini, Ph.D.**

gian.franco.bonini@sap.com

After a two-year postdoctoral fellowship in Heidelberg, Gian

# Class Notes

Franco left physics and got a job as a software developer for SAP. Gian Franco writes that he is happy in his current position as it provides interesting opportunities, yet leaves him enough time for other activities. He wrote, "I sometimes miss the intellectual challenges of working in theoretical physics, and of course Boston's cultural climate."

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## Douglas Brown, Ph.D.

brown@ieee.org

Doug switched from physics to financial engineering. He is glad to act as a resource for graduates interested in either field.

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## Bogdan Dobrescu, Ph.D.

bdob@fnal.gov

Bogdan recently left his postdoctoral fellowship at Yale to return to Fermilab, where he is now an Associate Scientist, a tenure-track position. Bogdan would be very happy to be contacted by graduates.

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## Joel Goldstein, Ph.D.

J.Goldstein@rl.ac.uk

After graduating, Joel worked as a postdoctoral fellow at Fermilab on the CDF experiment (rival to the BU D0 experiment). In the fall of 2002, Joel moved back to the UK to take a position as a research physicist at the Rutherford Appleton Laboratory, where he'll mainly be doing R&D on silicon detectors for future high energy physics experiments.

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## Bozidar Jovanovic, Ph.D.

bozidar@earthlink.net

Bozidar is currently working on

Wall Street, like many other physicists. His current position is as a "quant" -- a quantitative analyst -- for a hedge fund. "It is a very interesting and challenging job -- lots of statistics," he wrote.

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## Cyrill Muratov, Ph.D.

muratov@njit.edu

While we have not heard from Cyrill directly, he is currently an Associate Professor of mathematics at the New Jersey Institute of Technology.

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## Terry Russell, Ph.D.

drtsr@mail.com

Terry spends his time helping start-ups and advising venture capitalists on technology due diligence. He would be happy to act as a resource for students interested in the world of start-up companies, technology commercialization or the role of physicists in a business setting.

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## Stefano Zapperi, Ph.D.

zapperi@pil.phys.uniroma1.it

Stefano holds a permanent research position at INFN (Istituto Nazionale per la Fisica della Materia) in Rome.

# 1997

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## Chuck Ferguson, Ph.D.

ferguson@miis.edu

A year after graduation Chuck left academic physics and went into public policy work. "I've concentrated on issues of nuclear

arms control and non-proliferation," Chuck said. "Currently, I'm the scientist-in-residence in the Washington, DC office of the Center for Non-proliferation Studies, Monterey Institute of International Studies. Mainly, I advise the Center on physics related aspects of its non-proliferation programs. Presently, I'm co-directing a project assessing all the major aspects of nuclear terrorism."

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## Ned Green, Ph.D.

ngreene@bloomu.edu

Ned recently earned tenure and promotion to Associate Professor after teaching for seven years at Bloomsburg University in Pennsylvania. "Teaching is what I love to do, and that's what this job is all about," said Ned.

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## Iaroslav Ispolatov, Ph.D.

iispolat@lauca.usach.cl

After graduation, Slava held postdoctoral positions at McGill University, Cornell University, and Rockefeller University. Slava now holds the position of Profesor de Asociado at the Universidad de Santiago de Chile. His current research interests include the thermodynamics and phase transition kinetics of self-gravitating systems. Slava has also published papers on mechanisms of periodicity in volcanic eruptions and applying self-organized neural networks to cluster genotypes.

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## Xiaomei Liu, Ph.D.

Xiaomei.Liu@fmr.com

After graduating from BU,

# Class Notes

Xiaomei obtained a position as Senior Engineer at Auburn International in Beverly, MA. In this position, she worked on the design and development of industrial NMR. In 1999, she took a position as Consultant Software Engineer for Fidelity Investments in Marlborough, MA. She is currently working on software architecture and the design of enterprise applications.

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## Dinesh Loomba, Ph.D.

dloomba@unm.edu

Dinesh went to SLAC to work as a postdoctoral fellow with Martin Perl on two desk-top exotic particle searches. One search dealt with free fractional charges and development of technology to search interesting materials such as meteorites formed about 4.5 Gyrs ago. The second search was for ultraheavy, stable exotic particles in the mass range  $M > 10^{13}$  GeV. He left SLAC in 2000 for a research faculty position at University of New Mexico working on two high-energy cosmic ray experiments, HiRes (Utah) and Pierre Auger (Argentina). Dinesh became interested in observational cosmology and joined the Deep Lens Survey, a gravitational lensing experiment which aims to map out the dark matter in large scale structures over 28 square degrees out to a redshift of about 1. He is now working on a search for strongly lensed quasars. Dinesh is currently a tenure track assistant professor in the Physics and Astronomy Departments at the University of New Mexico.

## Hernan Makse, Ph.D.

makse@mailaps.org

Hernan spent his postdoctoral period in the laboratories of Professor Pierre-Gilles de Gennes (1991 Nobelist) at College de France, Paris; Hans J. Herrmann (Ecole Superieure de Physique et Chimie Industrielles, Paris); and Robin C. Ball (Cavendish Lab, Cambridge University, UK). He then worked at Schlumberger-Doll Research, an oilfield services company located in Ridgefield, Conn. for three years. Currently, Hernan is an Assistant Professor of Physics at the Levich Institute and Department of Physics of the City University of New York. His current research interests include granular flows, micromechanics and jamming in disordered materials, non-equilibrium kinetic roughening, scaling in complex systems, and porous media.

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## Yumian Su, Ph.D.

yumian.su.1997@alum.bu.edu

Yumian is currently at DSO National Laboratories in Singapore. She would be glad to be of any help to graduates.

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## Sveinn Valfells, Ph.D.

sveinn@dimonsoftware.com  
sveinn@stanfordalumni.org

Sveinn completed a one-year program in economics at Stanford after graduation. He dabbled in entrepreneurship, finance, natural resource economics, skiing and white water kayaking. Sveinn took a job with an Iceland-based population genomics company, deCode, where he was Director of Operations. He then became active as an angel investor and

consultant to tech start-ups and venture funds in Iceland and Scandinavia. He participated in founding and funding Iceland's first independent full service telecoms company and establishing a venture fund in Stockholm. Currently, Sveinn is Executive Chairman of Iceland based Dimon Software.

"Physics has proven to be an excellent background for business life in general and technology entrepreneurship in particular," said Sveinn. "The overall analytical skills are applicable in almost all aspects of business, but I have also found myself using basic physics to plan high-throughput genomics sequencing facilities and in evaluating novel telecommunications technologies."

Sveinn would be very happy to act as a resource for graduates.

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## Gandhimohan Viswanathan, Ph.D.

Gandhi@fis.ufal.br

Gandhi is currently teaching physics in Brazil at the Federal University of Alagoas. He would be glad to be a resource for graduates.

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## Townsend Zwart, Ph.D.

zwart@bates.mit.edu

Townsend currently is Research Scientist at the MIT Bates Linear Accelerator where he works in accelerator physics. He would be happy to be contacted by graduate students about professional opportunities.

# Class Notes

## 1996

**Vassilios Koulovassilopoulos, Ph.D.**  
vassilisk@hess.com

After graduation, Vassilios took a postdoctoral position at the University of Barcelona, working on phenomenology and lattice field theories. After military service, he moved to Paris to be a postdoctoral fellow at I.N.R.I.A. and started working on mathematical finance. In 2000, he moved to London where he obtained a permanent faculty position at the Business School of South Bank University, as a lecturer in Information Systems, where he applied statistical physics ideas to the theory of heterogeneous economic agents, consumption theory and market micro-structure. In 2001, Vassilios joined the London office of Hess Energy Trading Company as a Quantitative Analyst and Trading Strategist, where he builds derivatives models and assists in trading strategies.

Vassilios would be happy to be in contact with BU alumni.

**David Zimmerman, Ph.D.**  
dzimmerman@thinkfire.com

David is a patent agent and works as Director of Portfolio Operations for ThinkFire Services USA Ltd. In addition, he is an adjunct professor in the Computer and Electrical Engineering Department at the New Jersey Institute of Technology.

## 1995

**(Leonard) Pete Carter, Ph.D.**

carterl@dpg.army.mil

After completing his thesis in space physics, Pete went on to work at the Boston Air Route Traffic Control Center as a Computer-Based Instruction Administrator. He is currently working at the Dugway Proving Grounds in Utah.

**Apollo Go, Ph.D.**  
apollo.go@cern.ch

Appollo is a research scientist at the National Central University in Taiwan and is stationed full-time at CERN, Geneva. He is working on the silicon sensors, readout electronics, and the production database for the CMS (Compact Muon System) Preshower.

Appollo also continues to work on the foundation of quantum mechanics, a topic that he became interested in when writing his senior thesis with Abner Shimony. He is currently working on the first non-photonic test of the Bell Inequality by analyzing coherent semi-leptonic decays of neutral B pairs at the BELLE experiment in KEK, Japan.

**Carlos Marin, M.A.**  
carlosma@mail.usfq.edu.ec

Carlos is working at San Francisco de Quito University in Ecuador. He works with Dr. Bruce Hoeneisen in the field of elementary particle physics. They recently submitted a paper to the SPIRES HEP database about "Limits on

the Two Higgs Doublet Model from meson decay, mixing and CP violation. "I miss Boston University. My time there was very rich," wrote Carlos.

**Gary Varner, M.A.**  
varner@phys.hawaii.edu

After graduation, Gary worked as an experimental physicist and engineer on high energy physics experiments in China, Japan and CERN. He completed his Ph.D. in particle physics at the University of Hawaii in 1999. Gary was part of the core team that established a successful telecommunication company in Silicon valley, which allowed him to return to the "pleasurable environs of academia," where he plans to remain.

## 1994

**Giovanni Amelino-Camelia, Ph.D.**

Giovanni.Amelino-Camelia@cern.ch

After graduating, Giovanni was at MIT, Oxford University and the CERN laboratory, before returning to Italy to be faculty member of the Univ of Rome La Sapienza.

"The objective of my ongoing research is to find a unifying theory that would reproduce both General Relativity and the Standard Model of particle physics as appropriate limits," said Giovanni. "One challenge in this field is that it is hard to know whether I am on the right track. It is nearly impossible to compare theory results

# Class Notes

with experiments. Interest in my research by colleagues working in the same field is growing, but it is of course dangerous to be encouraged by the opinions of other theorists, without the support of experimental results.”

About his current position, he writes, "Now it is my turn: I supervise some PhD theses, and my students appreciate my informal "American style" (usually in Italy the student/supervisor relationship is rather hierarchical)

"Rome is a fantastic city, but I still miss Boston, especially the Charles, Fenway, Harvard Square and, believe it or not, some of the Boston-area Pizzerias. Fortunately every now and then I have an opportunity to spend a few days in Boston as part of a US trip for conferences and collaborations."

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## Albert-Laszlo Barabasi, Ph.D.

alb@nd.edu

Laszlo has become well-known for his recent and influential research on networks. He is the recent author of the popular book "LINKED: The New Science of Networks". Laszlo is currently the Emil T. Hofman Professor of Physics and Notre Dame University.

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## Eli Ben-Naim, Ph.D.

ebn@t13.lanl.gov

Eli held two-year postdoctoral research fellowships at the University of Chicago and Los Alamos. Now he is a staff member of the Theoretical Division in Los Alamos National Laboratory. His research is in the statistical

physics of nonequilibrium systems, in particular, stochastic processes in granular media including collision processes in granular gases, compaction of granular materials, and relaxation of topological constraints in granular chains. He also researches interacting particle systems and their application to problems in material science, chemical kinetics, population dynamics, social dynamics, and computer science. He is also a member of the Center for Nonlinear Studies.

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## Alonso Botero, M.A.

abotero@uniandes.edu.co

After receiving his M.A. at BU, Alonso graduated from the University of Texas with a Ph.D. in 1999. He worked as a postdoctoral fellow at Texas A&M and University of South Carolina with Yakir Aharonov. "I'm back home as faculty at my old Alma Mater," writes Alonso.

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## Iuval Clejan, Ph.D.

clejan@mindspring.com

Iuval worked as a semiconductor physicist/electrical engineer, but after 4 years decided to switch to molecular biology. Iuval writes that this is "a field where both experiment and theory are still thriving and can be done by individuals or small teams." He is willing to be a resource for graduate students.

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## Marco Fanciulli, Ph.D.

Marco.Fanciulli@mdmlab.mi.infm.it

Marco is currently a lab director for MDF - INFM in Italy.

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## Bill Herzog, M.A.

wherzog@ll.mit.edu

Bill is a member of the technical staff in the quantum electronics group in the solid state division. "Things are going well; most of my work is related to bio-defense, though my group is mostly into laser development and applications," he wrote.

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## Gregg Jaeger, Ph.D.

jaeger@bu.edu

Gregg is currently a Senior Research Associate in the Department of Electrical and Computer Engineering at BU. He would be willing to act as a resource for graduates.

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## Ramana Mani, Ph.D.

ramana@Princeton.edu

Ramana is currently a research staff member at the Program on Science and Global Security, which is part of the Woodrow Wilson School for Public and International Affairs at Princeton University. His move from physics research to policy studies was aided by a postdoctoral fellowship from the Social Sciences Research Council. He works on issues related to nuclear weapons and nuclear energy in India and on global nuclear disarmament issues. Ramana has received fellowships from the Guggenheim Foundation, the MacArthur Foundation, and the Social Sciences Research Council to pursue this work.

Ramana is also active in the peace and anti-nuclear movements in the US and India. He serves on the "Global Council of Abolition 2000," a network of over

# Class Notes

2,000 organizations in more than 90 countries working for the elimination of nuclear weapons.

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## Stanley Myint, Ph.D.

stanley.myint@rbos.com

Stanley is currently working in finance at the Royal Bank of Scotland, but still maintains contact with the department through his former advisor, Claudio Rebbi. He would be glad to be a resource for current and future graduates, especially those who are interested in a career in finance.

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## Sinisa Pajevic, Ph.D.

pajevic@helix.nih.gov

Since graduation, Sinisa has worked in the Mathematical and Statistical Computing Laboratory at the National Institute of Health. He is involved with biomedical research, primarily dealing with statistical analysis and the field of medical imaging -- particularly, Diffusion Tensor MRI (DT-MRI). DT-MRI is a new imaging technique known for its ability to image brain white matter fibers. His other projects include analysis of multi-electrode recordings of the in-vitro neural network preparations, estimation of genetic linkage, and association using Bayesian integrated likelihood approach.

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## John Smathers, M.A.

john@smathers.net  
smathers@molecularware.com

John is currently employed as a software engineer for a company that writes software for genomics research, specifically to address the data management issues related to the manufacture of DNA

microarrays. John currently focuses on database programming.

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## Anna Swan, Ph.D.

swan@bu.edu

Anna is currently a Research Assistant Professor in the Electrical and Computer Engineering Department at Boston University.

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## Jun Zhuo, Ph.D.

Jun.Zhuo@AIG.com

After completing his thesis in statistical physics, Jun took a postdoctoral fellowship in Computational Biology at the University of California, Berkeley. Subsequently, Jun moved into mathematical finance. He was a research associate for Gifford Fong Associates, a company based in California, and then he became a Global Market Officer for the Chase Manhattan Bank in New York City. He is currently Risk Analytic Principal Analyst for the American International Group, Inc. in New York City. In this capacity, Jun is responsible for all aspects of quantitative analysis and implementation of AIG's market risk initiatives. Jun leads a team of analysts and developers to incorporate pricing models for structured derivative and life insurance products into a risk management system.

resource for graduates. His main activities are teaching and popular writing.

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## Marcelo Camperi, Ph.D.

camperi@usfca.edu

Marcelo is an Associate Professor of physics at the University of San Francisco, where he chairs the department. At BU, he worked in topological field theory and phenomenology of elementary particles. Upon graduation, he became interested in the study of the brain from a physicists' point of view. Currently, Marcelo is working on theoretical and computational neuroscience. He is also interested in computational physics, mathematical physics, and computers in education.

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## Chris Fabri, M.A.

graviton6@mindspring.com  
christopher.fabri@morganstanley.com

Since leaving the physics program, Chris has been working for Morgan Stanley, IT, in New York and in Tokyo.

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## Sharon Glotzer, Ph.D.

sglotzer@umich.edu

After graduation, Sharon worked at National Institute of Standards and Technology (NIST) where she co-founded and then directed the Center for Theoretical and Computational Materials Science. For her research contributions in materials science, Sharon won the American Physical Society Maria Goeppert-Mayer Award in 2000. Sharon then moved to the University of Michigan where she is currently

# 1993

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## Michael Burstein, M.A.

mab@mabfan.com

Michael is happy to serve as a

# Class Notes

an Associate Professor of Chemical Engineering.

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## Greg Huber, Ph.D.

huber@umb.edu

Greg is currently a faculty member in the department of physics at the University of Massachusetts, Boston.

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## Ting Lei, Ph.D.

tinglei@WellsFargo.com

Ting has recently had considerable success in quantitative finance. "Although my physics career ended seven or eight years ago, I still have fond memories of the BU physics department and its faculty," wrote Ting. He would be happy to be a resource to graduates.

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## Chung-Kang Peng, Ph.D.

peng@chaos.bidmc.harvard.edu

Chung-Kang "CK" is the Associate Director of the Rey Institute for Nonlinear Dynamics in Medicine at the Beth Israel Deaconess Medical Center and Assistant Professor of Medicine at the Harvard Medical School. He is also the Associate Director of the Research Resource for Complex Physiologic Signals funded by the National Center for Research Resources of the National Institutes of Health. Dr. Peng is also a Visiting Scholar at the BU Physics Department and a Research Affiliate of the Harvard-MIT Division of Health Sciences and Technology.

Dr. Peng has expertise in statistical physics and its application to the study of physiological measures. He has been working

at the interface of statistical physics and biology since he was a graduate student.

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## Alex Perel, Ph.D.

mnaperel@juno.com

Alex manages the micro-contamination group at Axcelis Technologies, a company that manufactures semiconductor devices. Alex manages scientists and engineers that design and test equipment to reduce the amount of particles and other contaminants that can infiltrate semiconductor devices.

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## Peter Poole, Ph.D.

ppoole@stfx.ca

Peter is an Associate Professor of physics at St. Francis Xavier University and he also holds the Canada Research Chair in Modelling and Computer Simulation.

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## John Ross, Ph.D.

jbross@msdpt.k12.in.us

John is a physics and calculus teacher at Southport High School, Indianapolis, Indiana. He would be glad to be contacted by students would be interested in high school teaching.

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## Srikanth Sastry, Ph.D.

sastry@jncasr.ac.in

Srikanth is a faculty fellow at the Nehru Center for Advanced Scientific Research in Bangalore, India. He would be happy to serve as a resource person for graduate students and alumni. Since he is in India, any assistance he could provide will probably be limited to

Indian graduate students wishing to return to India.

# 1992

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## Astero Provata, Ph.D.

aprovata@limnos.chem.demokritos.gr

Astero is a senior researcher at the Institute of Physical Chemistry, part of "National Center of Scientific Research 'Demokritos,'" the national research institution of Greece. "I am now married to Anthony Mistriotis, a doctoral graduate of the University of Illinois," wrote Astero. "He is also a physicist (Computational Fluid Dynamics) and is working at the Agricultural University of Athens. We have twin babies, one year old, Demetrios and George." Astero is willing advise graduate students about professional opportunities.

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## Mousumi Roy, M. A.

mroy@unm.edu

During his research work at BU, Mousumi became interested in geophysics and transferred to MIT where she completed her Ph.D. in geophysics in 1997. She is currently an Assistant Professor at the University of New Mexico, where she works on such problems as geodynamic modeling of lithospheric deformation, lithospheric evolution, and fault dynamics. "Dinesh Loomba (Ph.D. '97) and I are married," wrote Mousumi. "Dinesh started on a tenure-track position at UNM also, so we feel pretty lucky with two jobs. We also have a 15 month old, Ishan, who has kept us really

# Class Notes

busy - I really had no idea what a huge change it would be to the way we live/work! He is an incredibly active guy. He is full of energy. It is fun though, and we are both still happy doing science too, so can't complain."

## 1991

### David Considine, Ph.D.

d.b.considine@larc.nasa.gov

David is a research scientist at NASA Langley in the Chemistry and Dynamics branch of the Atmospheric Sciences Division. His research involves computational modeling of atmospheric trace constituents in the stratosphere and troposphere, and analysis of satellite, aircraft, and ground-based atmospheric trace constituent measurements. "A physics degree is good preparation for my research," writes David. He is married with two daughters.

### Jysoo Lee, Ph.D.

jysoo@hpcnet.ne.kr

Jysoo is currently a scientific staff member at the Super-computing Center of the Korea Institute of Science and Technology Information (KISTI).

### Mohammed Tahar, Ph.D.

mtahar@brockport.edu

After graduating, Mohammed worked with Prof. George Zimmerman on feed-throughs using Hi-Tc superconductors. He then went to Ireland to join family and to teach. Mohammed was appointed to a tenure-track position at SUNY Brockport in

1997. He works in low-temperature physics, studying Ferric Chloride Intercalated Graphite, layered materials with 2D electrons, and 2D magnetic systems, as well as superconductivity and phase transitions.

### Pablo Tamayo, Ph.D.

tamayo@genome.wi.mit.edu

Pablo is a senior computational biologist manager at Whitehead Institute and MIT Center for Genome Research.

### Ed Victor, M.A.

Ed has an R&D position as a Systems Engineer at Qualcomm, which specializes in cellular and satellite communications. He helps create and design new concepts, works with developers to engineer products, and tests product performance. Ed received a Masters degree in Electrical Engineering from University of Colorado in 2000, and now has three patents. Currently, he is working on "third generation" cellular technologies for world markets. Ed married six years ago and has a three year old daughter.

## 1990

### Ming Lu, M.A.

ming.lu@gs.com  
minglu23@yahoo.com

Ming transferred to Caltech after receiving his M.A degree. He is currently working for Goldman Sachs in New York.

### Lawrence (Yehudah) Posnick, M.A.

ylposnick@yahoo.com

After he left B.U., Larry taught in a local yeshiva high school, which combines Jewish studies with secular subjects in the afternoon. He then studied a year and a half in Israel for rabbinic ordination. He is now married and living in Israel and has worked at various teaching jobs, including giving private lessons in undergraduate physics. He continues to have an interest in physics and is seeking to get back into the field. He would be glad to serve as a resource for current/future graduates.

## 1989

### Kenneth Gall, Ph.D.

Kenneth.Gall@UTSouthwestern.edu

Ken is currently working in radiation oncology and he writes that he has been very happy in switching from research in experimental particle physics to medical physics. He would be happy to serve as a resource for graduate students.

## 1987

### Shawn Burdick, Ph.D.

sburdick@adelphia.net

Shawn went to work for a private firm that contracted out to NASA, DoD, NOAA and other institutions that put optical and IR sensor systems in space. He worked up to principal scientist for large grants. "But I was becoming increasingly unhappy working

# Class Notes

insane hours and never had any time for my family," wrote Shawn. "I was starting to spend more time on administrative garbage, like budgets, than on science, so I 'retired' in 1999, staying on part-time. I am now a full-time high school physics teacher at my old high school. I LOVE it! I took a 50% pay cut, but a huge raise in lifestyle. I now work a four acre farmstead in a 1880 old saltbox farmhouse. I now get to spend lots of time with my family."

Shawn would be glad to serve as a resource for students.

## Thomas Earnest, Ph.D.

TNEarnest@lbl.gov

Thomas works at the Berkeley Center for Structural Biology at Lawrence Berkeley Laboratories.

## 1986

## Daniel Hong, Ph.D.

It is our sad duty to report that Daniel Hong died in July 2002 due to liver disease. Daniel was a Professor of Physics at Lehigh University for many years where he made many important research contributions to the physics of granular materials. Daniel is survived by his wife Susy and four children.

## 1985

## R. Chandrasiri Samaratunga, Ph.D.

samararc@healthall.com

R. Chandrasiri Samaratunga is

a medical physicist at University Hospital in Cincinnati, OH.

## 1983

## Steve Millman, Ph.D.

millman@us.ibm.com

Steve joined IBM after graduation as a research staff member in the Magnetic Recording Department at the Almaden Research Center. In 1988, he moved to the Thomas J. Watson Research Center. His current interests include system and application software for enabling prototype high-pixel-density displays to function with modern operating systems. He would be glad to act as a resource for students.

## 1982

## Robert Beland, Ph.D.

Robert.Beland2@hanscom.af.mil

Bob has been a physicist in the Air Force Research Lab for the past 20 years, mostly doing research in atmospheric turbulence. He currently leads a 44-person group conducting atmospheric research and a smaller group doing seismology research. Bob is an NRC-approved advisor and has resources to sponsor postdoctoral fellows as well summer faculty. "I think most students are completely unaware of an Air Force laboratory in suburban Boston, one that presents opportunities for summer employment, post-docs and full time employment," wrote Bob.

## Liacir Lucena, Ph.D.

liacir@dfte.ufrn.br

Liacir is professor of physics at Universidade Federal do Rio Grande do Norte in Brazil. He is glad to renew the contact with the physics department, colleagues, and professors.

## Andre Mirabelli, Ph.D.

amirabelli@ttaa-cref.org

Andre is currently working at TIAA-CREF. "I was wooed away by Wall Street," said Andre. "Now I spend my time cogitating on how to construct the proper formal definitions of concepts such as the return on a day of an issue within an actively traded portfolio, or the contribution of a decision to hold an issue at differing weights over a period to the period's excess of the portfolio's return over a benchmark's return. It is amazing how similar is the experience of the research process of applying mathematics to physical concepts vs. to financial concepts. I still publish an article per year, and give a talk at a conference every now and then." Andre would gladly speak with graduate students about the financial world.

## 1980

## Brian Holmes, Ph.D.

bwholmes@sjsuvm1.sjsu.edu

Brian studies the physics of music and recently gave an interesting colloquium in the physics department on the subject. He is currently in the physics department of San Jose State University.

# Class Notes

## 1976

**Demetris Paraskevopoulos, Ph.D.**  
demetris@nif-t.net

After graduation, Demetris spent two years as a research staff member at the MIT National Magnet Lab before moving to Xerox in Rochester, NY where he did product development and technology management.

Demetris was transferred to Los Angeles, where he led corporate efforts to bring microelectronics technologies (ASIC) to all engineering organizations of Xerox worldwide.

Demetris then went to National Semiconductor in Silicon Valley, initially as VP of Marketing, and later Sales of all subsystem products. He got involved in establishing programs for increasing corporate innovation and spinning-off successful new technologies.

He then spent several years in high-technology startup firms, and later founded a consulting firm that works with high technology companies during the formative years of their business.

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**Leon Stommes, M.A.**  
LJSAPS@aol.com

Leon has spent over twenty years working in the high tech industry, for companies such as EMC, Compaq/Digital, and Sanders Associates. He has worked with fault tolerant middleware, backup/restore software, semiconductors, system

utilities, operating, storage, and high performance systems that have been applied to financial exchanges, online banking systems, command and control communication systems, and intelligence systems. He is willing to be a resource for graduates who may have questions about careers in high tech.

## 1971

**Larry Rothman, Ph.D.**  
LRothman@CfA.Harvard.edu

Larry is a physicist in the Atomic and Molecular Physics Division of Harvard-Smithsonian Center for Astrophysics. He has been directing the HITRAN molecular spectroscopic database almost since its inception in the 1970s. "HITRAN is the recognized international standard molecular spectroscopic database used for generating synthetic spectra required to carry out atmospheric remote sensing, detection of constituents, and high-resolution atmospheric optical radiative propagation studies," writes Larry. "HITRAN research involves a combination of quantum-mechanical solutions of molecular Hamiltonians to very high accuracy, acquisition of high-resolution laboratory data for molecular absorption and collisions, and validation efforts. The articles describing the HITRAN database are among the most cited references in the geosciences.

Larry is a Fellow of the Optical Society of America, an officer of the International Radiation Commission, Associate Editor of

Journal of Quantitative Spectroscopy and Radiative Transfer, and an invited professor at the University of Paris.

## 1970

**Rajendra Gupta, Ph.D.**  
rgupta@uark.edu

Rajendra was the Physics Department chair at the University of Arkansas. He will enjoy hearing from old colleagues.

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**Phillip Hoeper, Ph.D.**  
phillip.hoeper@jhuapl.edu

Phillip was in the Army from 1970 to 1973, working at a tandem Van deGraff accelerator. Then he worked for the Link Simulation Systems Division of Singer, building training simulators for nuclear power plants until 1983. Philip also worked at General Physics, which did simulator work, mostly for nuclear power plants. "One of the most interesting assignments was to serve as a consultant to the North China Institute of Electric Power, in Baoding, China," said Philip. "This is an entire university dedicated to the electric power industry. They train engineers, managers, operators, maintenance people, etc. all in one place." Philip eventually returned to Link Simulation, now called S3 Technologies, before working on aircraft simulators at Hughes/Raytheon. He has also worked at Johns Hopkins Applied Physics Lab, writing software for analysis of data from nuclear submarines.