

2002

Department of Physics Newsletter: Spring 2002

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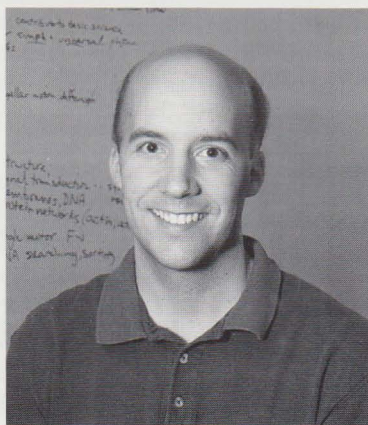
Department of Physics Newsletter

University of Massachusetts Amherst

Issue 2 Spring 2002

Bringing in the New!

Tony Dinsmore is a new Assistant Professor who came to us last September ('01) from Harvard. He studies "soft condensed matter," especially the statistical mechanics of systems in which small particles (such as gold nanoparticles, or cell membranes) are suspended in a fluid (e.g. water). Such systems can behave as viscous fluids, can condense into a "solid," or behave in other, intermediate ways. To gain insight into *why* they do this, Tony's group uses mostly optical techniques (imaging, spectroscopy and scattering) to



see what individual particles are doing. A current focus is on disordered, non-equilibrium particle gels: "When the system becomes a gel-like mass, how does the pattern of individual motions change?"

Colloidal particles can also spontaneously arrange themselves into regular, crystal-like patterns. The optical and structural properties of such self-assembled materials is another focus of his group's research efforts. Such assemblies can show a "Photonic Band Gap" through which visible light cannot propagate, so that the material becomes a perfect reflector, and under some conditions a "wire," which can conduct light around atoms just as copper wire can conduct current around corners. A major goal is to develop and characterize materials with a complete photonic band gap in the optical frequency range.

In collaboration with other UMass faculty, Professor Dinsmore is also exploring solution-based self-assembly of nano-

see **Dinsmore**, page 4....

Ringling out the Old!



Some of Gerry Peterson's former Ph.D. students in nuclear physics celebrated Gerry's retirement on March 8 and 9 with talks about current physics and recollections about physics at UMass. Front row: Xiaodong Jiang '98 (Rutgers), Yury Kolomensky '97 (U.C. Berkeley), Steve Churchwell '98 (Duke). Back row: Zen Szalata '76 (Stanford Linear Accelerator Center), Brett Parker '85 (Brookhaven National Laboratory), Itaru Nakagawa '99 (Tohoku/MIT), Gerry (the one with a tie), Jay Flanz '79 (MGH/Harvard).

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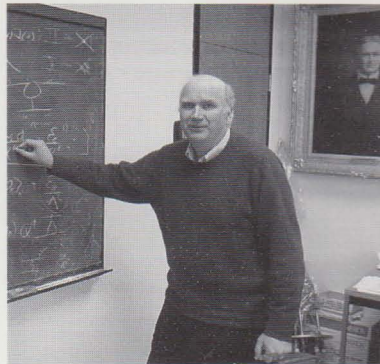
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Department of Physics - University of Massachusetts Amherst

A Letter from the Department Head

Dear Alumni and Friends,

This year has been a dramatic one at UMass. The leadership of the institution is in transition, and we have, among others, an Acting Chancellor, Acting Provost, and Acting Dean, as temporary leadership. The Acting Deputy Provost is even the Physics Department's own John Dubach and the Acting Graduate Dean is our Jim Walker. All of these people are kind enough to help guide UMass while we search for permanent administrators. And they have certainly gotten more headaches than they bargained for! The Commonwealth tax receipts have plummeted post-9/11 and UMass has taken heavy budget cuts mid-year. We have been lean for many years and these cuts are very damaging. There has also been a state-mandated early-retirement program, which removes 80% of the salary base for those who retire. (See page 7 for recent



John Donoghue, Head (and Philip Hasbrouck, background)

physics retirements.) Hiring or rehiring is minimal, and many classes will not be able to be offered. If I look for a silver lining in this mess, it is that the crisis is severe enough that drastic measures are being considered. The attrition has been random and it is clear that we need to identify the core mission of the university and keep that core healthy. The planning for this has started and, with a new Chancellor expected on board July 1*, hopefully we will see the revitalization of UMass start next year.

In the Department of Physics we are doing our best to keep up the strong programs that have been our standard. On a more positive note, the Department went through a program review by an external visiting committee and came out with flying colors. Our research programs were praised, the junior faculty members were specifically complimented, improvements in the teaching program were noted, and our future plans were endorsed. We have a good solid foundation for the future, and look forward to the rebuilding that should occur over the next few years.

I hope that you enjoy this newsletter. Creating this newsletter is also a

positive experience for us. We have many activities that we are proud of and we get to reflect on the successes of our present and past students. Our best wishes go to all of our extended Physics family.

Sincerely,

John Donoghue, Head

Editors' Comment:

Much of the preceding is not good news. These are extremely perilous times for the Commonwealth of Massachusetts. State revenues continue to decline, and in turn the University's budget has been cut and cut again. You can contribute directly to the **Department of Physics**, so that allocations may be made where they are needed most, by making your check out to the University of Massachusetts, but mailing it to the Department. Or, you can specify the Department of Physics when giving to the Annual University Fund. Our phone number is (413) 545-2545, and our mailing address is on the back cover. Every gift, no matter how small, will be deeply appreciated, and will help support the wide variety of educational and research activities reported in this newsletter.

*John V. Lombardi, former president of the University of Florida, will be our new chancellor. David Scott, former chancellor, will be teaching "Science and Religion" in our department during the fall semester, 2002.

Our Head Search committee has recommended that Jon Machta be appointed Head to replace John Donoghue, who is stepping down at the end of the spring semester after two (three-year) terms. The department has voted to strongly endorse this choice.

University of Massachusetts
Department of Physics Newsletter

Editors: Bob Krotkov
Gerry Peterson
Monroe Rabin

This second issue of our newsletter is being sent to more than 1,150 of our alumni and alumnae who received degrees in physics from the 1940's to the present, and to former staff and faculty. For more information about our department, visit our website at <http://www.physics.umass.edu> Comments about the newsletter or information about yourself may be e-mailed to us at newsletter@physics.umass.edu or sent to the address on the last page.

Research

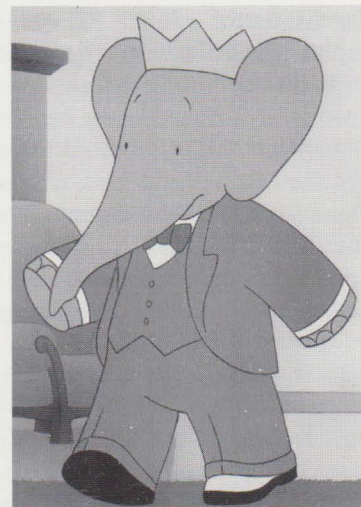
High Energy Physics

Why matter?

In the beginning, over 12 billion years ago, there were equal numbers of particles and their antiparticles. But when particles meet antiparticles, they annihilate one another in a flash of energy, just as the familiar electron when meeting an anti-electron (positron) can annihilate into photons. Then why does the Universe exist? Why didn't antimatter cancel out matter? This is the *big* question that UMass high-energy experimenters Guy Blaylock, Carlo Dallapiccola, Stan Hertzbach, Dick Kofler, Stephane Willocq, and their students, are trying to answer in experiments at the Stanford Linear Accelerator Center (SLAC). As Fig. 1 shows, high-energy electron and positron beams are stored in independent storage rings, one located atop the other. The beams cross over and

collide to produce other particles, including the exotic B meson and its antiparticle, the B-bar. Since the electron beam has about three times the energy of the positron beam, the collisions are called "asymmetric," meaning that after the collision occurs the mesons continue to move in the direction of the electron beam at close to the speed of light. Therefore it takes longer for them to decay and the differences between matter and antimatter can more readily be ascertained. The mesons are detected in a 1,200 ton detector, called *BaBar*, built by a collaboration of 600 physicists from nine countries. A major UMass contribution to *BaBar* was the instrumentation of 6,580 scintillating Cesium-Iodide crystals costing \$20 million that are used in particle identification.

Over 40 years ago Cronin and Fitch found that the decay rate of anti-*K*-



mesons slightly exceeded that of *K*-mesons, which they attributed to violation of charge and parity (CP) symmetry. (Under this symmetry, particles and antiparticles must have the same properties.) For this work they were subsequently awarded the Nobel Prize. The domination of matter over antimatter as the universe expanded and cooled following the Big Bang is thought to have come from such CP violation. The Standard Model theory of particle physics predicted that CP violation should be much larger for the exotic *B* than for the *K*. This provided the motivation for building of the SLAC "B-Factory" that would copiously produce *B*'s and would provide a thorough check on CP violation. The *BaBar* collaboration found this CP violation as predicted. However, this is only the beginning. Data will continue to be taken in searches for new phenomena not explained by the Standard Model of particle physics.

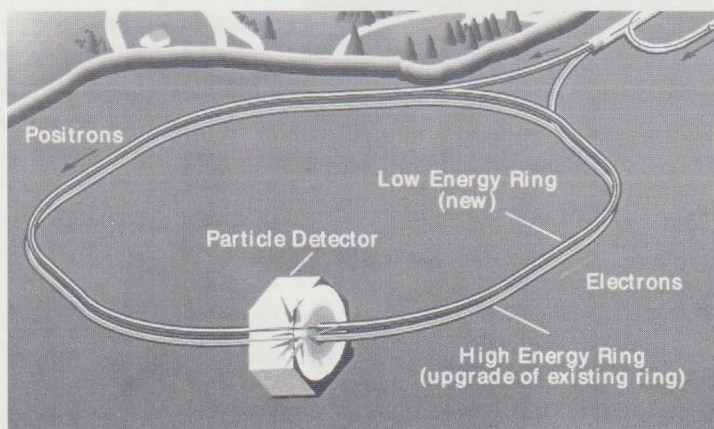


Fig. 1. Colliding beams of 9 GeV electrons and 3.1 GeV positrons at the SLAC "B-Factory"

Condensed Matter Experiment

Physics of Disorder

Though in physics courses we studied many idealized systems, we always knew that the real world is full of complexity and disorder. It turns out that the disorder itself can show a certain order, and complexity can follow simple rules. For example, in magnetism we study the laws governing the magnetic state of a piece of iron - but inside the iron the magnetic domains are jumbled together in an irregular way. One consequence of this is that the magnetic state of the iron depends not only on the magnetic field applied to it now, but also on previous history (*hysteresis*). This is the type of problem that interests **Professor Po-zen Wong**.

Before joining our department in 1988, Po-zen worked for Schlumberger-Doll Research, an oil-exploration company, where he studied disordered magnetic systems as well as sedimentary rocks, which are important for the oil industry. In a porous sandstone, pore surfaces (analogous to magnetic domain walls) separate solid sand grains from fluid-filled pores. In both cases a crucial question is: "How rough is the interface?" Po-zen probed the surface with neutron scattering, which is sensitive to roughness on the scale of the neutron de Broglie wavelength.

Po-zen pointed out to us another similarity between sandstone and a ferromagnet: "One reason oil companies cannot extract all the oil from a porous rock is that some of the pores contain oil, some water. The oil-water interface is *pinned* (stuck to the sand grains) - just as domain walls in a magnet are pinned by random defects and impurities. In both cases, the pinning leads to *hysteresis*." In a rock, the boundary

between oil and water is irregularly arranged, just as are the boundaries of magnetic domains in magnetized iron. When a pressure head is applied to force the oil out, the amount forced out depends on previous history.

Recently, Po-zen has been fascinated by another manifestation of disorder: coffee stains, which were the subject of a doctoral thesis at the University of Chicago by a former UMass student, **Richard Deegan** (B.S. '92). Have you ever noticed that coffee stains are dark near the edge and light in the middle? According to Deegan, this is because the contact line at the edge of the spilled drop is *pinned* by the microscopic disorder found on any table top. The evaporation rate of the

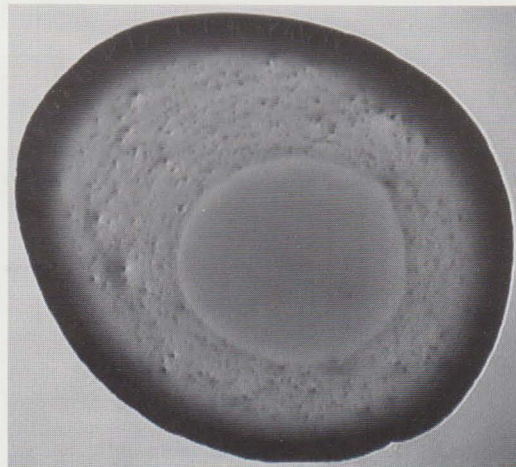


Fig. 1. A laboratory "coffee stain."

drop is largest near this contact line because the drop's curvature is discontinuous there. (This implies that a large solid angle is available to receive evaporating molecules.) Water flowing inside the drop toward this edge carries the ground coffee particles which are deposited there to form a dark ring. Figure 1 shows a reproduction of this phenomenon in Po-zen's laboratory by **Erik Schaeffer** (M.S. '97), who



Fig. 2. Close-up of ring, showing "fractal" structure.

studied the dynamics of contact line pinning for his thesis. Instead of brewing coffee for his experiment, Schaeffer put some blue food dye into water drops. You can see that the stain left behind has a dark ring no different from coffee stains. In Fig. 2 a close-up view of the ring shows that the dye molecules actually grew in a branching, fingering structure. Wong explains that the fingering is due to an interfacial instability, which as a matter of fact also plays a role when oil companies try to produce more oil by injecting water into the oil reservoir. Disordered systems, be they coffee stains, magnetized iron, or oil in sandstone, have more physics in common than one might expect!

Tony Dinsmore (continued from front page)
scale electronic components and novel membrane structures.

Tony and his wife Jennifer have two children, Jack, and Rosa, who is just two months old. The family is buying a house and likes miniature horses!

Condensed Matter Theory

Quantum Computers

Nikolay Prokof'ev is a condensed matter theorist who came to us from the Kurchatov Institute in the fall of 1999. He is interested in the physics of small systems in which quantum effects are important - for example, nanometer size molecular magnets, tiny superconducting loops with tunnel junctions, or ultra-cold gases. These are the kinds of systems which are being talked about as quantum computers, a hot topic nowadays. The quantum mechanical state of such a system may be thought of as a set of "qubits" whose time evolution is a (quantum) computation. The trouble is that in the real world, the qubits are only imperfectly isolated from a dirty, noisy, unpredictable environment - such as photons, sound waves, magnetic waves...you name it. Nikolay is working on the mechanisms which disrupt the pure quantum mechanical evolution of the qubits.



It turns out that at low temperatures the most trouble is caused by the flipping of nuclear spins, which are everywhere. In quantum mechanics, the observer plays a special role: an observation "collapses" the wave function. Ironically, in this case the role of observer is played by the smallest participant: a nuclear spin.

Nikolay is also actively involved in computer simulations using advanced quantum and classical Monte Carlo techniques. With his collaborators he has recently studied the quantum phase transition that occurs in an ultra-cold atomic gas trapped at the intersection of three orthogonal laser beams. When the laser beams are switched off, the interference of matter waves radiated from the trap site changes dramatically and the gas undergoes a transition from a superfluid to an insulating phase.

Nikolay and his wife Svetlana have a 15 year old son - who no longer says "make me." He is taking taekwondo lessons (a Korean martial art)! With their son in school, Svetlana recently joined a local agency and is starting a new life in real-estate.

Teaching

Undergraduate Program

In the old days, homework in introductory physics courses was dealt with in discussion sections. Now we use the Online Web-based Learning system (OWL) for electronic homework. OWL was developed here at UMass and is now used by 24 departments, a local high school, and UMass Boston. The Scientific Reasoning Research group in our physics department has been a pioneer in its development. Prof. **Arthur Swift** played a major role in establishing the OWL system in our department. In this system, students can work on problems online in their dormitories, at home, or in the

departmental resource room, where old-fashioned human help is available in the form of TAs and faculty. (See photo on pg. 11.) In doing a problem, students are asked to check the right answer out of a list and can re-do each problem if they are not satisfied with their performance. Hints are provided if they check a wrong answer. However, they cannot just try all the answers till they get it right because the input numbers change randomly each time they begin the problem. Another change in our undergraduate physics program is the establishment of three tracks: the **Professional (P)**, the **Applied (A)** and the **General (G)**. The

P track is intended for traditional students going on to graduate school in physics or related fields. The majority of our graduates are still in this track. The A track requires students to take a concentration of 18 credits in a technical field in place of certain Physics courses. It attracts many students who want to double major in Physics and a related field such as Astronomy, Mathematics, or Environmental Science. The G track is intended for a students who wish to concentrate in a non-technical area such as teaching or science writing. Currently we have a baseball varsity player in this program who intends to teach high school.

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Graduate Program

Although a former graduate student visiting the Department would feel very much at home, there have been changes. **Bill Gerace** is Graduate Program Director, replacing **Jim Walker**, who is now *Dean of the Graduate School*. **Jane Knapp** is the full time staff person responsible for the graduate program, doing whatever is needed bureaucratically, and being a friend to all students.

We have had 29 faculty departures, mostly retirements, and 10 hires over the past ten years. The reduction in faculty size has affected the courses offered. For example, Classical E&M has been reduced to a single semester and relativistic Quantum Mechanics is now part of the intermediate QM sequence. Although there is great student demand, it has become difficult to offer advanced research-area courses. The department is currently working on ways to improve this situation, including of course the hiring of additional faculty.

This past year saw the largest number of new students in recent years. Our graduate student mix now includes 38 foreign students, 20 who matriculated at an American university, and six German exchange students. Spearheaded by the younger faculty, we devote more personal attention to those admitted to the program, use Departmental and grant overhead funds to provide incentives, and guaranteed summer support for all, and have implemented a training program for new students to help acclimate them to the Department and their new environment. Graduate teaching assistants and research assistants have unionized and their union has been successful in negotiating pay raises and improved conditions.

Several years ago, the Department adopted an electronic homework (OWL) system that eliminates most hand-grading of assignments. Instead, five or six TAs are now assigned to a physics resource room to help undergraduates with homework questions in any of their physics courses – quite a challenge!

Some research programs have disappeared as faculty have retired, but new faculty have developed a strong program in soft condensed matter physics, a discipline focused on complex systems, such as colloids and gels. Planning is also well underway for a life science physics program.

Outreach

The Science, Technology, Engineering, and Mathematics program (STEM), under the direction of Emeritus Professor Mort Sternheim, has received a grant from the National Science Foundation that will provide \$21,500 fellowships for each of ten UMass graduate students to work with Springfield middle school teachers on the implementation of research projects with their students. The first yearly cycle will begin in June and will be followed by two other cycles. Summer workshops will start this June followed by two semesters in a course focused

on teacher learning of project-based instruction while concurrently developing similar projects with the middle school students.

Physics Graduate Student Association

It may have been about a year ago: a physics graduate student had to give an estimate of the total number of graduate students in our Department. “Certainly not more than twenty,” he said. In fact, our department always has had almost sixty graduate students. The wrong guess testifies to the fact that most of them just had not met each other.

In April 2001, the Physics Graduate Student Association (PGSA) was born, with the intent of bringing the students together. A constitution was written, members recruited, and meetings called.

The first PGSA Social was held at the Amherst Brewing Company. Attendance was great, and many physics graduate students met each other for the first time. Quote of the day: “Hi, I am from the physics department too.”

(continued on page 7)



A Graduate Student Social

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PGSA (continued from page 6)

More Socials and other events took place. The physics graduate students became a body capable of acting as a group and reaching common goals. They discussed department policies and more than half of them signed a petition to the department for high level condensed matter courses. They became represented in superordinate organizations like GEO (Graduate Employees Organization) and GSS (Graduate Student Senate), and they tapped funding sources for student organizations.

This semester, they started the Student Seminar, in which members give talks to other members, on topics ranging from the interpretation of quantum mechanics to supersymmetry.

After slowly sprouting from its seeds, the Physics Graduate Student Association has grown into a young tree in the course of about a year. PGSA Socials draw ever more people. Our constitution is being revised on the basis of experience we have gained in about a year. Our executive board now counts

eleven active officers and is looking forward to even more involvement from our members.

In conclusion, this has proved to be a successful experiment; no one would now underestimate our number as twenty.

Web site: <http://www.physics.umass.edu/pgsa/>

Current PGSA officers are: Oliver Ruebenacker, John Cummings, Xuenan Li, Kevin McCarthy, Lisa J. Kaufman, Yung Ho Kahng, Klebert Feitosa, Ozgur Yavuzcetin, and Xiaotao Peng.

People

Faculty Honors

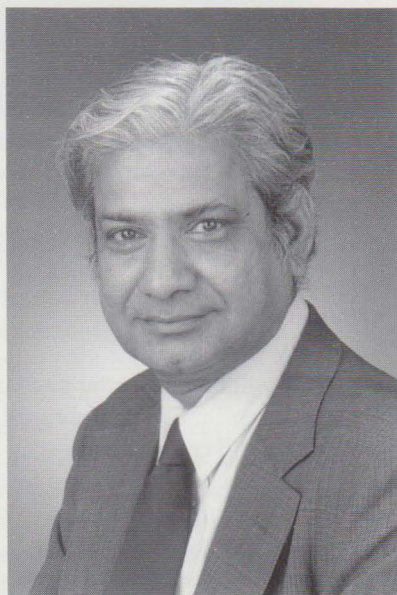
In August of 2001, **Robert Hallock** became a *Distinguished Professor*. Bob was an undergraduate here and has had a long distinguished career in teaching and low temperature physics research. He has served on many university committees and was Head of the Department of Physics.

Professor **Michael Kreisler** received awards at Lawrence Livermore National Laboratory for his contributions to proton radiography and for studies at the extremes of temperature and pressure in the National Stockpile Stewardship Program.

The New England Section of the American Association of Physics Teachers awarded the 2001 Janet Guernsey Prize for Excellence in Physics Teaching to Professor Emeritus **Morton Sternheim** for his many years dedicated both to college and pre-college teaching, for the many programs and workshops he has conducted, and for the authorship of his physics textbook for biology and pre-med students.

Faculty Retired

Roy Cook _____ 12/31/01
Richard Kofler _____ 8/31/01



Professor **Kandula Sastry**

In Memoriam

Professor **Kandula Sastry** died of a heart attack on November 25, 2001 at the age of 66. He had devoted 38 years of service to the university. He will long be remembered for his generosity to students and for his work in radiation- and biophysics. Among his contributions to our department, he created the Kandula Endowment Fund for awards to high-achieving physics students (see Awards).

From 1970 to 1984, **Arnold Sweeney** was a research machinist, primarily for the Nuclear Physics Group. He died on September 28, 2001 at the age of 84. Arnold was kind and patient in his dealings with both graduate students and faculty, and often improved on their designs of experimental equipment.

Katherine Pope, a Smith College student, worked on UMass nuclear physics projects at SLAC with Smith Prof. P. Decowski. While bicycling to work on July 5, 2001, she was fatally hit in traffic. A SLAC fellowship has been established in her honor. (See page 8, Awards).

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Visitors

David Griffiths, Professor of Science at Reed College served as a Five College Distinguished Professor of Physics this academic year. He is the author of undergraduate texts on electrodynamics, quantum mechanics, and elementary particles that are among the most widely used nationwide. In 1997 he received the prestigious Millikan Award from the American Association of Physics for his outstanding success in the classroom. He obtained his Ph.D. in theoretical physics from Harvard and was a UMass postdoctoral research associate in 1972-74.

Undergraduate Awards

Kandula Award

Julie Nantais, Brian Hourigan,

Hasbrouck Scholarship

Melissa Motew and Kevin Ann

Youngren Research Award

Melissa Motew

Field Award

Adam Marquis

Katherine Pope Award

Jennifer Joyce

Graduate Student Awards

Arthur R. Quinton TA Awards

Laurel Mayhew - 1994

Edwin Eckel - 1994

Ian Beatty - 1995

Deborah Lee - 1996

Joe Adams - 1996

Prasad Venugopal - 1997

Hao Qi - 1998

Meg Lysaght - 1998

Otilia Gabor - 1999

Moataz Emam - 2000

Pablo Marrero - 2000

Dwight Luhman - 2002

Izabela Santos - 2002

Christopher Knutson - 2002

Mini Puthayathu Kurian - 2002

Staff News: Machinists

The Department of Physics is fortunate in having a first-class, state-supported machine shop, which builds state-of-the-art instruments. Many of the experimental projects require high precision, and leak-tight welding of intricate apparatus. The shop has specialized instruments such as a Plasma Needle Arc Welder, which can be used to join parts as thin as 0.003 inch (about the diameter of a human hair). However, one piece of equipment the machine shop does not

Pollard. The "Tower" shop in the Graduate Research Center is run by Dick Letendre. Our four current machinists have about 150 years of experience between them. In the industrial world, they would be described as "tool-makers" or "designers". They make precision parts out of exotic materials, and also function as consultants and designers. They are very involved with each project: "A student's success is our success".

Those of you who had an interaction with the machine shop may remember



Left to Right: Dick Letendre, Walter Pollard, Ashley Webb

have but could certainly use is a numerically controlled milling machine. The shop also serves the Departments of Astronomy and Chemistry.

Many of you will remember the student shop in the basement of old Hasbrouck. It is still there, still crowded with machines, and has been supervised by Rick Wilkey since the early 70's, though Rick is currently considering retirement at the end of this semester. Old-timers may remember Modeste Poudrier, who supervised the student shop before Rick arrived; Rick took over when Modeste moved to Chemistry.

The "main" machine shop in the basement of new Hasbrouck is now staffed by Ashley Webb and Walter

the names Jud Stone, Walter Piela, Bob Verner, Arnold Sweeney*. The first three have all retired and live in the area.

Bob Verner lives in Erving, just north of Amherst. He retired in 1996 after working in the shop for 13 years and is enjoying life: he heats his house with wood which he cuts himself, goes hiking, and is looking forward to having his daughter move in across the road. Of his years here, he says: "I was never bored - there was always something new and interesting to do, and I liked interacting with the students".

(continued on page 9)

Machinists (continued from page 8)

Jud Stone lives in Florence and builds Queen Anne furniture. He left the physics department in 1975 to work for Radio Astronomy, and later for high-tech "spin-off" companies founded by some of our astronomers. Of his UMass days he remembers that he and the shop worked on a large variety of projects,

and he found this variety to be very stimulating (particularly if the project were connected with space).

* see In Memoriam, page 7



Rick Wilkey in the student shop

Alumni News

David Battisti (B.S., '78) writes:

I vaguely recall my rationale for choosing to be a physics major: I would obtain a good "toolbox" for whatever I might choose to do, and it was unlikely that I could learn physics without some help. Well, I would like to thank the faculty and fellow students for helping me to obtain an exceptional education. I ended up receiving a Ph.D. in Atmospheric Sciences from the University of Washington (UW), in '88. My thesis was on the physics of the El Nino phenomenon, and fortunately, my theory seems to be supported by the observations collected over the past 10 years. After two years at Wisconsin, I returned to UW where I am now Professor and Director of the Joint Institute for the Study of the Atmosphere and Ocean (a joint venture between NOAA and UW) and co-chair of the Science Steering Committee for the U.S. Program on Climate (US CLIVAR). My research is focused on understanding the natural variability of the climate system, and in particular how the interactions between the ocean, atmosphere, land, and sea ice lead to climate variability on seasonal to decadal time scales. My training in physics continues to serve me well. (david@atmos.washington.edu)

Phil Catagnus (M.S. '66) writes:

After reading the Spring 2001 Newsletter it is no wonder that an endowed chair was named for Robert L. Gluckstern. Gluckstern's professional contributions to UMass were numerous and he obviously made a difference in the success of the university. I would be remiss if I didn't acknowledge the difference he made in my life. He is remembered as a kind and caring human being who took a personal interest in each and every student. I always had an experience of being welcome, included, and supported for the two years I spent at UMass. Dr. Shin R. Lin and Dr. Claude Penchina also deserve these acknowledgements. Even though I only use a fraction of what I learned in my present endeavors, I am very well grounded in the physical sciences. My education at UMass has provided me with a certain confidence that allows me to pursue business that maybe I would otherwise not pursue. If it is difficult to assign a dollar value to my educational experience at UMass, so I would say it was priceless. (philc@valquest.com)

Steve Churchwell (Ph.D. '98) is a postdoctoral research associate at Duke University where he has been engaged in low-energy nuclear research on few-body systems at the Triangle Universities Nuclear Laboratory. This includes neutron-proton capture, the most important nuclear reaction in the early universe and the source of the largest uncertainty in the synthesis leading to the present isotopic abundance in the universe. Before this work, he investigated the structure of the proton by using high-energy electron scattering at the Thomas Jefferson National Laboratory. Steve has a daughter Astrid, a son Tristan, and a new son, Hartley, born 3/9/01, who still isn't sleeping through the night. (stevec@tunl.duke.edu)

Benjamin Crooker (B.S. '77) received a Ph.D. from Cornell in low temperature physics in '84. From '83 to '85 he was at USC working on superfluid ^3He . In '85 he became an Asst. Prof. at Purdue. In '91, after promotion and tenure, he shifted his research to the low temperature properties of diluted magnetic semiconductors such as CdMnTe. He says, "In '95 my wife accepted a position at Columbia University and I

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took a one year leave while we relocated to the New York City area. In '96 I joined Fordham University where my research currently focuses on sputtered films of InSb heavily doped with Fe. In 2000 I was elected to a term as chairman of the Physics Department. On the personal side my wife Colleen and I have been married for 15 years. We have two sons, Patrick, 13, and Ian, 10. Our home lives revolve around school and an endless series of football, basketball, and baseball games, swim meets, choir performances, cub scout meetings, etc. My son Patrick is now learning some basic physics as part of a revamped junior high science curriculum. This has made me a very popular resource among his friends!"
(crooker@fordham.edu)

Charles Dandreta (B.S. '00) is on the faculty of Pinkerton Academy in Derry, NH (P.O. Box 4171, Windham, NH 03087). Since he is a Pinkerton alumnus, going to work is like a homecoming for him. [Editor's note: Chuck was active in the Society of Physics Students (SPS) at UMass, and he especially enjoyed traveling to high schools and junior high schools and giving live physics demonstrations with other SPS members. He liked working with the kids and they liked him. He should be ideally suited for his new job.] Currently he is teaching physics and chemistry to 9th graders.
(dandreta@hotmail.com)

Jeffrey Gordon (B.S. '83) got a Ph.D. in Medium Energy Nuclear Physics at the University of California at Berkeley. There he met some designers of semiconductor imaging chips, with whom he is working now. In the interim he returned to Boston to work in Medical Physics developing imaging system technologies for a few years in the 90's. He then moved back to

California with his family (Michaela and son Cameron) where he is the research director at a San Jose start-up company designing medical imaging systems, especially for dental work. He says, "I got my start in all of this by doing a Senior Honors thesis with Prof. Ross Hicks on the development of an areal thickness monitor. I really appreciated the time and interest that Ross devoted to my education. It has benefited me throughout my career."
(jgordon@sun1.com)

Brian Lamore (B.S. '85) writes: I am currently serving as a teacher in the Peace Corps in Nepal. I meet UMass graduates everywhere I go. Before the Peace Corps I worked as an engineer in both the defense and semiconductor industries for 14 years. Although I may be "evolving" away from a technology vocation, I consider my UMass education extremely valuable, and I think fondly about the years I spent at UMass. Since graduating, I have lived in eight states and have traveled (for business) to numerous foreign countries. I feel my degree has helped in allowing me to "see" the country/world. I very much enjoyed receiving your newsletter (forwarded to Nepal a few months ago). (Dr. Peterson. I remember you well: How you wrote with your left hand, and at the same time, erased the blackboard with your right!) I was both happy and sad to read that some of my former professors had retired; a lot of water has passed under the bridge I suppose. If possible please extend my greetings to professors Brehm, Englesberg, Mullin, and Shafer. Best regards and namaste,
(bclamore@yahoo.com)

John Lareau (B.S. '72) writes: Great newsletter! I had Dr. Gluckstern for freshman physics and had Dr. Hallock for the first class he taught at UMass (junior-year mechanics). He had just

arrived from Stanford that had won the NCAA baseball collegiate-world-series and he had several photos of their team on his office door. Presently, I am working for Westinghouse Nuclear Services as Chief Engineer for the field services department. My physics background has been invaluable in my primary technical area of nondestructive testing of various components of nuclear power plants. We have had the opportunity to apply our technology to such various structures such as the space shuttle, the Alaskan pipeline, satellites, and off shore oil wells. I have maintained contact with the University over the years through the Chancellor's Council and season tickets in football and basketball. (17 Reed Hill Rd., Granby, CT 06035
(john.p.lareau@us.westinghouse.com)

Peter Morgan (M.S. '92) left UMass for London, UK, where he is now in telecommunications. His interest in the internet led to positions at Cisco Systems and to AT&T Global Solutions where he is now a Network Design Engineer and is responsible for designing large scale global IP networks. He is particularly interested in optical networking which permits switching of terabits per second of Internet traffic. By reading about developments in string theory on the Internet, he keeps in touch with physics. Peter has an English wife and two beautiful (but noisy) children, Luke and Charlotte. He recently visited our Department while on vacation in the U.S.
(pmorgancisco@yahoo.com)

Department of Physics - University of Massachusetts Amherst

Alexey Petrov (M.S. '94, Ph.D. '97) had a postdoctoral fellowship in theoretical particle physics at Johns Hopkins for three years, followed by a postdoctoral associate position at the Laboratory of Nuclear Studies at Cornell. Since the fall of 2001 he has been an Assistant Professor at Wayne State University in Detroit where he is building a particle theory group. He has taught relativistic quantum mechanics and is revitalizing their SPS chapter. He writes: "I enjoy being a faculty member, and I appreciate some of the additional tasks and responsibilities that it entails."

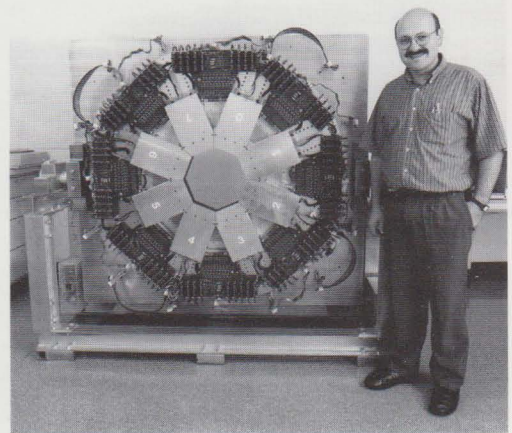
(apetrov@physics.wayne.edu)

Satish C. Prasad (Ph.D. '72) is a professor of radiation physics in the Dept. of Radiation Oncology at SUNY, Upstate Medical University, Syracuse, NY. After finishing his Ph.D. with Prof. John Brehm as his advisor, he had a two-year postdoctoral position at the University of Rochester in New York. "I found it difficult to make a living in High Energy Physics in 1974, so I went for a 2-year training position in physics applied to medicine in Denver, Colorado. There were plenty of jobs in this field in 1976 and there still are." (114 Robbins Lane, Dewitt, NY 13214) (prasads@mail.upstate.edu)

George Theofilos (B.S. '60) writes: Since my days at UMass I have been a physicist, an engineer, and a mathematics teacher. Now I am retired, but am still working on physics. Several years ago I formed Theo Industrial Controls, Inc. to research and develop a gravitational motor. (gtheofilos@aol.com)

Jorge Uribe (Ph.D. '93) sent us this response to our Spring 2001 Newsletter: It was a very pleasant surprise to receive the department's newsletter, great job! Thank you for

including me in your mailing list. I am now in Houston with my wife Luz Patricia Cano and children Santiago and Daniela, where I am Asst. Prof. of Nuclear Medicine and Asst. Physicist at the U. of Texas M.D. Anderson Cancer Center. A current focus in my research is in nuclear instrumentation, in particular for Positron Emission Tomography (PET) for diagnosis of brain and breast tumors. (juribe@di.mdacc.tmc.edu)



Jorge and his pet PET scanner

Nearly Alumni (Graduating Seniors-a partial list)

Jonathan P. Celli will begin graduate studies in physics at Boston University.

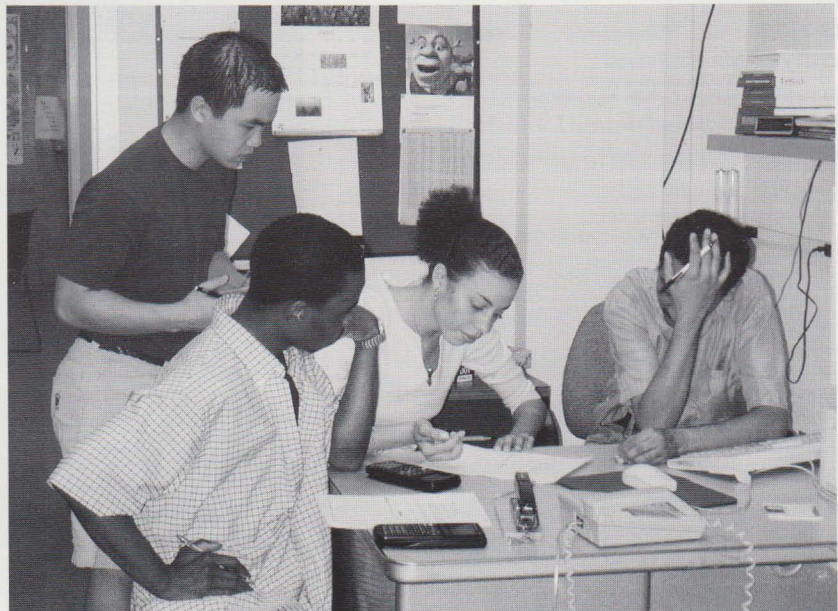
Elizabeth Clark will begin graduate studies in physics at UMass.

Tarek Halabi will begin graduate studies in physics at UMass.

Ryan McWilliams will begin graduate studies in geophysics at Berkeley.

Dean Reese plans to teach high school physics and chemistry in Tracy, California.

Andrew G. York will begin graduate studies in physics at the University of Maryland.



Physics students at their "OWL" homework (see pages 5,6)

Where are they now?



This picture shows our new (mostly) graduate students as of November 1966:

Rear Row: Gwendolyn Ewart, Mrs. Nancy Wylie Lee, Kwo-ray Chu, Guy Yagunoff, Daniel Krause, Michel Mathis, Monte Haun, Satish Prasad, John Cambell, Chester Hitz, Eugena Walter.

Front Row: Ching-cheng Wang, Robert Mohr, Edward Cheng, Philip Rynes, Patrick Manzo, Jonathan Weiner, John Lochhead, Richard Halpern, Michael Belanger

We have heard from Dan Krause and Satish Prasad; if you are one of the others - drop us a line to tell us what you are doing now! Either go to the web at <http://www.physics.umass.edu> and click on Newsletters or send us e-mail at newsletter@physics.umass.edu, or write to the return address below.

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