THE WISCONSIN PHYSICIST

VOL. 9 NO. 1 A NEWSLETTER FOR UNIVERSITY OF WISCONSIN PHYSICS ALUMNI FALL/WINTER 2002–03

UNIVERSITY OF WISCONSIN–MADISON

Newton's apple tree in final setting, including stonework, plaque, fence and complementary plantings in the Botany botanical garden.

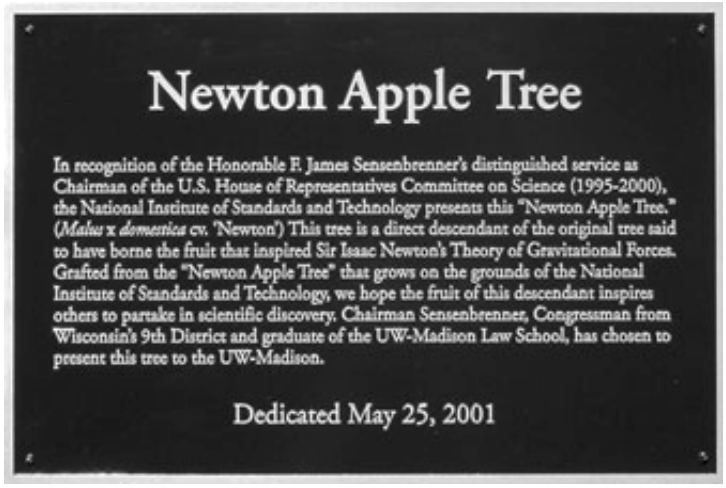
Cover picture: One and one-half year's growth.

FEATURES

• ***Remember to talk to us and send us your updates!***

Newton tree bears fruit!

Photos on this page & cover by Jim Hanesworth



Bronze plaque as it appears on the fence.

GREETINGS TO PHYSICS ALUMS & FRIENDS

I'd like to begin by introducing myself and sending my warmest greetings to you from Madison. I've been on the UW-Madison campus since 1977, mostly as a Department Administrator, and most recently in the Economics Department. Jean Buehlman retired, and I began to fill her shoes in February, 2002. I'm still learning and very much enjoy working with the Physics faculty, students and staff.

This newsletter will highlight a few of the exciting events since I arrived. On April 25th and 26th, we had a site visit from the American Physical Society Climate Team, consisting of a committee of four women: June Matthews, Margaret Murnane, Meg Urry and Cathy Newman-Holmes. Many of our women from physics, including research faculty and post-docs, undergraduates, graduate students, faculty and advisors met with this committee and provided them with feedback. We are waiting to receive their report and recommendations.

Mary Anne Clarke

Later in this newsletter you'll read about our relatively new course series for physics majors: Physics 247, 248 and 249. We are working on fine-tuning this program, and hope you will pass information about this to seniors at local high schools in your area or relatives who might be interested in pursuing a degree in physics here at UW-Madison. This fall we have an all-time record in Physics 247, three sections due to high interest, for a total enrollment of 44 new students. Physics 249 has 19 students currently enrolled.

The remodeling of Chamberlin Hall continues on schedule; we had a great group of undergraduates and graduate students receive Physics awards in May, 2002; enrollments in physics courses are slightly up this fall; our international teaching assistant program this summer went very well with eight new international students attending; our TA orientation program went well this fall; and I am looking forward to energizing the Physics Department with new ideas.

Thank you for your continued support for this newsletter project. Please keep sending me your information and news; I look forward to getting to know all of you!

Mary Anne Clarke, Editor

VIEW FROM THE CHAIR

Another year, my second in this term, has gone by far too swiftly. My "to-do" list has not appreciably shrunk, and all my good intentions are at best partially achieved. Progress is perceptible, but slow, and there are several "bumps" in the road ahead.

The shocking and tragic events of September 2001 left us all in awe of the tenuous hold we have on rationality and life. The aftermath continues to be characterized by an increased level of anxiety and concern with travel delays and visa problems for some of our international students.

Those who have been seriously affected by these events, please be assured of our sympathy and concern. We stand together in searching for a safe and secure passage to a more predictable and serene future.

Don Reeder

The bursting of the stock market "bubble" certainly further augmented our feeling of uncertainty and loss of control of events. This has caused potential faculty recruits to rethink changes and faculty members to reconsider retirement plans. The losses have adversely affected the ability of the UW Foundation to provide the support of research, start-up packages, etc. that we have come to rely on.

These, together with the deterioration of the economy, both on the national and the state level, will provide quite enough challenges in the days ahead, thank you!

But there is an upside to the situation. The talents and accomplishments of my faculty colleagues continue to be recognized and utilized. Although further information is available elsewhere in the newsletter, I note the following:

- Prof. Willy Haeberli was elected to the National Academy of Sciences.
- Prof. Dieter Zeppenfeld received the Kellett Mid-Career Award.
- Prof. Baha Balantekin is now the Chair-Elect of the Division of Nuclear Physics of the American Physical Society.

- Prof. Baha Balantekin was also elected a Member-at-Large of the Executive Committee of the American Physical Society Forum on International Physics.
- Two colleagues have received Sabbatical leaves: Prof. Thad Walker intends to pursue his research in atomic and optical physics, while collaborating on a book; and Prof. Paul Terry will conduct his research throughout the U.S.

Finally, in its first year, the "Newton Apple Tree," gift of the Hon. James Sensenbrenner, Member of Congress, has borne fruit! (Please see the cover.) We hope that it is a good omen for our future endeavors.

During our recent reviews, one item was identified that is beyond the capability of the Department alone to rectify — the adequacy of the allotment of space to the Department. Although the renovation of Chamberlin Hall will address the quality of the Department's space, the quantity remains in short supply and limits programmatic expansion and development. The acquisition of additional space will be a long-term effort requiring the assistance of the College and Campus as well as the UW Foundation and the generosity of our donors.

I was privileged to again preside at the Department's Third Annual Awards Banquet held in May, during which I presented two Distinguished Alumni Fellow Awards. The first was to Drs. Jeffrey and Lily Chen in recognition of their outstanding careers and for their continued interest in and support of the Wisconsin Physics Department. In particular, they have generously endowed a graduate fellowship. The second was to Dr. Dale Meade of the Forrestal Plasma Physics Laboratory, who has had a very illustrious leadership role in the national fusion energy program.

Another highlight of the ceremony was the presentation of Distinguished Faculty Fellow Awards to Prof. (emer.) William D. Walker of Duke University and Prof. (emer.) John Cameron of the UW in recognition of their careers, which have been filled with outstanding contributions to physics and to academia. These awards are in addition to the customary recognition of the outstanding TA and various other awards to graduate and undergraduate students.

The evolution of the Department continues as we cope with the changing physics opportunities open to the faculty and the trends in physics research. The innovative campus approach to faculty renewal has two parts — conventional recruitment and the so-called interdisciplinary "cluster" hires. Illustrative of the former approach, we searched for a theoretical astrophysicist and were successful in attracting Dr. Dan Chung, who will join the Department in September 2003. In the other direction, the Department has been particularly well served by former Chancellor Ward's "Madison Initiative" in which he challenged the legislature and the Governor among other things to match the UW Foundation in support of an increase of the Madison faculty by about 10%. Although the program has been slightly curtailed recently due to the dire financial straits of the State of Wisconsin, it has had a significant effect on the department. We have successfully competed for these positions and have been able to attract: Prof. G. "Pupa" De Stasio in biophysics; Prof. Robert Morse, Astroparticle physics; Assistant Prof. Albrecht Karle in Astroparticle physics; and Assistant Prof. Mark Eriksson in Nanostructures. The most recent are Gary Shiu, a theorist interested in quantum string theory, and Ellen Zweibel, a computational plasma astrophysicist from the University of Colorado, whom we share with the Astronomy Department. In the fourth round of the initiative we were successful in a joint proposal with Mathematics to search for three faculty members in String Theory and Topology. We identified several promising candidates and managed to complete negotiations with one of them, Dr. Gary Shiu of the University of Pennsylvania, who joined us this September. And we are back "on the street" to search for two additional theorists.

Finally, as I remarked above, the end of our residence in Sterling Hall is now in sight. The School of Pharmacy has moved to their new building on the west side of campus adjacent to the hospital. The vacated space has been assigned to Physics. The renovation of the building now almost 100 years old is estimated to cost $22 million and will be completed in phases. In phase I, the former Pharmacy wings of Chamberlin Hall have been completely gutted with only the floors and external walls remaining. A very exciting activity over the past year or so has been the detailed planning of the remodeling, and we believe we have a working solution to the renovation. It remains to be seen how these plans are viewed by the contractors. The schedule now calls for the phase II (reconstruction) to begin about January 2, 2003. We will post the progress on our web site, so please check in from time to time to see the updates. (http://www.physics.wisc.edu/)

Don Reeder
Professor of Physics
Current Chair Physics Dept.

REMODELING OF CHAMBERLIN HALL

by Dave Huber

A large part of Chamberlin Hall is being remodeled to accommodate departmental offices and laboratories located in Sterling Hall. Once the project is completed, the space in Sterling Hall currently occupied by Physics will be renovated for the Psychology department. The Astronomy department will remain in the east wing. The Physics department will retain space in the basement now being occupied by the Nuclear and Atomic physics groups.

The remodeling of Chamberlin, estimated to cost $22 million, is taking place in two phases. In Phase I, the space that was formerly occupied by the School of Pharmacy, is being demolished. Only the outer walls and the load-bearing inner walls remain. There is also some remodeling of space on the third and fourth floors of the Physics area to accommodate research activities on the second floor that will be displaced by the remodeling activities in phase II. Phase I began in March 2002 and is scheduled for completion in October.

Plans for phase II are currently undergoing final review. Awarding of the contract is expected by the end of the year with construction to start early in 2003. Once construction begins, the project is expected to take about 16 months. The Atomic and Condensed Matter groups will have laboratories and offices on the first and fifth floors. The department offices and the mailroom will be on the second floor. The second floor will also contain two intermediate size lecture halls, seven classrooms, the museum and lecture demonstration storage space. There will also be space for the undergraduate physics club and new laboratory space for Plasma physics. The department will make use of the renovated Rennebohm Auditorium as a replacement for historic Room 1300 in Sterling Hall. The remodeled space on the third and fourth floors will house the instructional laboratories, the electronics shop, offices and a graduate student lounge. There will also be new lab space on the fourth floor for the AMANDA/IceCube research team as well as new lab space on the sixth floor for Space Physics.

For current information, including photographs of the construction, check out the department web site www.physics.wisc.edu.

FACULTY NEWS

Two New Faculty Join the Physics Department

After a vigorous 2001–02 faculty recruitment effort led by the New Staff Committee (Dan McCammon, Susan Coppersmith, Don Cox, Bernice Durand and Tao Han), along with Don Reeder, Chair and Herb Wang, the Associate Dean of Physical Sciences, the Physics Department starts this fall with one new assistant professor, **Gary Shiu**, and we have one acceptance from Assistant Professor **Daniel J.H. Chung**, currently at CERN in Geneva, Switzerland, who will begin in fall 2003.

Gary Shiu

Professor Gary Shiu received his Ph.D. in theoretical physics in 1998 from Cornell University. He then worked at the Institute for Theoretical Physics at Stony Brook as a research associate, before joining the University of Pennsylvania as a long term research fellow. Prof. Shiu's research focuses on string theory, which is a unified quantum theory of all forces (including gravity) and matter in nature. His work encompasses both the fundamental and mathematical aspects of string theory, as well as its implications to particle physics, astrophysics and cosmology. He has made significant contributions to the inception and development of the idea of "brane world" — an idea suggested by string theory that the Standard Model particles and gravity can live in different spacetime dimensions. His most recent research has focused on understanding what string theory can tell us about the early universe and physics beyond the Standard Model of particle physics.

Promotions

Congratulations to **Peter Timbie**, who has been promoted to Full Professor of Physics, effective fall 2002.

Timbie's research group is studying the oldest photons in the universe. The cosmic microwave background (CMB) radiation, the thermal radiation re-

maining from the hot Big Bang, fills the sky with a nearly uniform glow. It is believed to provide us with a direct view to a time when the universe was only 0.001% of its current age. In the last decade, measurements of this radiation have discovered the seeds out of which all galaxies and larger structures were formed as predicted by the "standard model" of the Big Bang, called inflation. But these new observations have created new questions that are stretching the inflation model to its limits. We used to believe that gravitational attraction would slow down the expansion of the universe and possibly cause a contraction (Big Crunch) sometime in the distant future.

Peter Timbie

It now appears that the universal expansion is not decelerating at all, but rather, is accelerating in response to some cosmic force that is not at all understood. We have strong evidence that most of the matter in the universe is not in the form of "ordinary" matter such as protons and neutrons, but rather, is in the form of some mysterious "dark matter" and "dark energy." We are now in the middle of a modern version of the Copernican Revolution: not only are we not at the center of the solar system, or the center of the galaxy, or the center of the universe. We are not even made of the same "stuff" that makes up most of the universe!

Future measurements of the CMB promise to reveal even more secrets of the early universe. In particular, the CMB has recently been shown to be polarized at the level of 10-6 of its absolute intensity. Timbie's group has undertaken two experiments to measure this signal: the POLAR experiment, that has completed observations with a custom-built polarimeter at UW's Pine Bluff Observatory, and the COMPASS experiment, that will make further observations from White Mountain, CA. The group is now developing the tools to carry out even more sensitive measurements of this polarization. Polarization signals can probe fundamental physics that occurred in the first 10-35 seconds of the universe, a measurement critical for verification of the standard models of cosmology and particle physics. At the Wisconsin Center for Applied Microelectronics the team is building superconducting microwave sensors that they hope will allow measurements of these tiny signals. Timbie maintains a strong commitment to teaching as well. For the past few years he has been the Coordinator of the Undergraduate Program and last spring was elected to the UW Teaching Academy.

Congratulations to **Cary Forest**, who has been promoted to Associate Professor of Physics, effective fall 2002.

Cary Forest

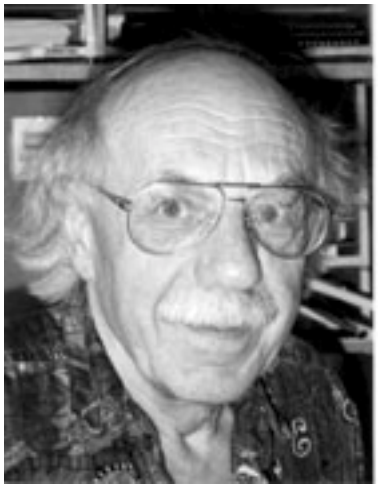
Dr. Cary B. Forest received a Bachelor of Science degree from the University of Wisconsin in 1982. He received a Magnetic Fusion Energy Science Fellowship from the DOE to attend graduate school at Princeton University where he received a Ph.D. in 1992 in the Astrophysical Sciences department. His thesis, supervised by Dr. Masayuki Ono at the Princeton Plasma Physics Laboratory, received the Simon Ramo Award for Outstanding Doctoral Thesis Research in Plasma Physics from the APS. In the course of his thesis work he invented and demonstrated a non-inductive method of tokamak formation based upon the bootstrap current.

After graduate school he spent five years working at General Atomics as a Scientist where his work focused on studies of plasma resistivity, non-inductive current drive, rf heating of plasmas and MHD instabilities in tokamak plasmas. In 1997 he became an Assistant Professor of Physics at the University of Wisconsin. At Wisconsin, he has developed research programs in Liquid Metal dynamos and in stabilization of MHD modes in fusion plasmas by flows of liquid metal walls, and continues to work in current drive by rf heating in plasmas. He is the recipient of the Alfred P. Sloan Fellowship and the David and Lucile Packard Foundation Fellowship. He has served on scientific committees for the American Physical Society and the National Research Council.

Sabbaticals Awarded 2002–03

Both Profs. **Paul Terry** and **Thad Walker** have been awarded academic year sabbaticals in 2002–03 to pursue their research.

Faculty Awards



Willy Haeberli

Nomination to National Academy of Sciences

Prof. **Willy Haeberli** has been elected to the National Academy of Sciences. Election to the academy is among the most coveted and prestigious honors in all of science. Haeberli is the Ray Herb distinguished professor of physics and the Steenbock professor of natural sciences. A native of Switzerland, he is a world authority in the area of nuclear polarization studies essential to the fundamental understanding of nuclear physics.

Prof. Haeberli was one of two UW-Madison professors among 72 scientists elected in early May at the 139th annual meeting of the academy. The National Academy of Sciences is a private organization of scientists and engineers dedicated to furthering science and its use for the general welfare. Established in 1863 by an act of Congress, NAS is charged with advising the federal government, upon request, in any matter of science or technology.

The Turkish Science Prize

Prof. **A. Baha Balantekin** has been awarded the Turkish Science Prize for, "his world-renowned seminal contributions to nuclear and particle astrophysics." He received a medal in a ceremony in November, 2001. He is the third member of the University of Wisconsin to receive this prestigious award.

2002 WARF Mid-Career Awards

Prof. **Dieter Zeppenfeld** has been awarded the Kellett Mid-Career Award, which promotes the continued scholarly efforts of established faculty.

The Wisconsin Alumni Research Foundation sponsors the $60,000 awards, one of several annual programs supported each year by WARF's block grant to the university. Candidates must be between five and twenty years past their first promotion to a tenured position. Winners are chosen by a committee of the UW-Madison Graduate School. The award is named after William R. Kellett, a former president of the WARF Board of Trustees and retired president of Kimberly Clark Corp.

Prof. Zeppenfeld, one of the world's leading physicists in theoretical particle physics and collider phenomenology, is applying quantum field theory to probe the forces at the smallest distance scales. He laid the foundations to test weak-gauge-boson self-interactions in electron-positron collisions. His recent work on producing and studying the Higgs boson at the Large-Hadron-Collider has revolutionized the search strategies for this particle that is believed to explain the origin of mass. Beyond research, he is a popular teacher of graduate courses.

2002 Vilas Associates Awards

The recipients were Profs. **Brenda Dingus** and **Andrey Chubukov.**

2002 Teaching Academy

Prof. **Peter Timbie** has been elected to the 2002 UW-Madison Teaching Academy.

Special Chancellor's Award

Prof. **Bernice Durand** received a special Chancellor's award on May 8, 2002, as the faculty member who contributed the most to campus diversity through her work on Plan 2008.

2002 Tibbetts Award

Prof. **Max G. Lagally**, E.W. Mueller Professor in UW-Madison Department of Materials Science and Engineering, has been awarded a 2002 Tibbetts Award. The prestigious awards honor individuals, small firms, projects, and organizations that have used the stimulus of Small Business Innovation Research funding to make a clear and definable difference. Lagally was honored along with the company he founded, Piezomax Technologies Inc., now nPoint Inc. (Reprinted from Capital Times, 9/20/02.)

ISI Web of Science Recognition

Prof. **Franz Himpsel** is on the ISI Web of Science list of the most cited scientists. Only 0.5% of the researchers who publish are on this list, and Franz is one of only seven researchers to make this list. The College of Letters and Science has only one other recipient, **Bob Hamers**, from Chemistry. Worldwide, there are one hundred people on the list. For perspective, the list contains two UC-Berkeley people, one from Illinois, and Michigan has none.

QUANTUM COMPUTING WITH COLD ATOMS

by Mark Saffman

Sustained advances in semiconductor based computing power at a rate closely following Moore's exponential law have had far reaching effects on society, commerce, and the practice of science in the new information age. Mass produced central processing unit chips are now being sold with 0.13 μm feature widths. At these scales transistors contain but a few hundred dopant atoms. Future advances will lead,

within the next 10–20 years, to a situation where electronic circuit elements consist of only a handful of atoms. In such a situation the laws of quantum mechanics must be used to analyze, optimize, and design electronic devices. It is thus inevitable that a quantum mechanical description of nature will be a central tool in maintaining the current rate of advance in information processing technology.

The need for quantum mechanics in describing atomic scale devices comes as no surprise. What is remarkable, however, is that quantum mechanics can be exploited to perform certain computations faster than is possible on *any* classical computer. Early insights into quantum computation by Feynman, Deutsch, and others were followed in the 1990's by the development of explicit computational algorithms that harness the power of quantum mechanics. The most prominent example is Peter Shor's algorithm, published in 1994, which provides an exponential speedup in the time required to factor a number on a quantum computer, compared to the time required on a classical computer. Since the difficulty in factoring long numbers lies at the heart of public key cryptography systems, the construction of a quantum computer would change decisively the security landscape.

While no one doubts the theoretical advantage of a quantum computer, no one knows how to build one yet! In order to factor a 200 digit number on a quantum computer (this is about the limit of present day classical computers) it would require a machine with about 10,000 quantum bits, called qubits. So far the best anyone has done is less than 10 qubits using nuclear magnetic resonance and 4 qubits using trapped ions. A mad race is on to build a practical quantum computer. Scientists working in many different fields are exploring different approaches to creating a practical device. With support from the Army Research Office and The National Science Foundation totalling about $3 million over the next five years, Assistant Professor Mark Saffman and Professor Thad Walker have embarked on an ambitious project to build a scalable quantum computer using individual atoms.

The goal of the project is to build a 32 atom array of qubits as shown conceptually in figure 1. The basic ideas are deceptively simple. We focus an array of laser beams to very small, micron sized spots. Each focused laser beam creates a potential well that can be used to trap an atom. Even though the atoms are safely trapped they are very well shielded from the outside world. The optical traps work just fine, even though on average an atom only scatters less than one photon per second. The ground state atomic hyperfine levels of trapped Rb atoms will be used to store the quantum information. Calculations show that information can be stored this way for many hours without loss. To perform a computation the atoms need to interact with each other so that the state of one atom depends on that of a second atom. The interaction also has to be well controlled in order for the computation to be done correctly. We can control atomic interactions by turning on additional laser beams that boost the atoms into highly excited Rydberg states. Two neighboring atoms in Rydberg

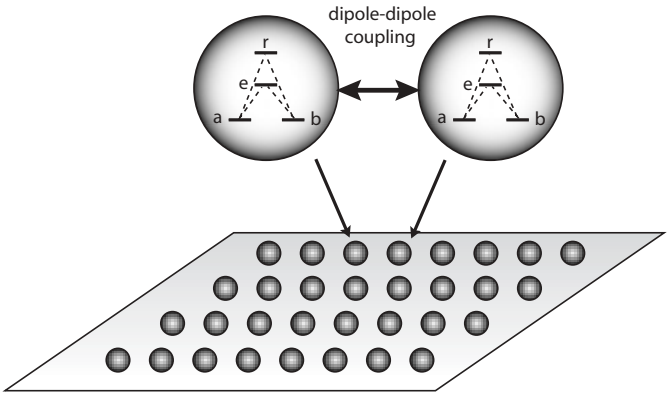


Fig. 1: Two-dimensional array of atomic qubits.

states interact with each other through a dipole-dipole coupling that will allow us to perform a basic two-atom gate in about 1 μs.

Successfully building such a device will require a solution of many technical challenges. All the tools we need are available in the interaction of laser beams with atoms, and atoms with each other. Putting it all together will require a lot of hard work over many years. We also expect a lot of side benefits from this work. No matter how long it takes to build a practical quantum computer we will learn a lot along the way about the behavior of single atoms, and how to manipulate them. This will be useful for creating new types of laser sources that emit photons in a controlled sequence, and for constructing nanoscale materials atom by atom. Our work with atomic quantum computing will also add to the already strong activity in the department led by Mark Eriksson and Bob Joynt who are working on semiconductor-based quantum computation.

(See the article in "The Wisconsin Physicist," fall 2001.)

NEW PHYSICS MAJORS SEQUENCE: MEET PHYSICS 247-248-249

by Professor Mark Eriksson

Most college graduates with an enthusiasm for technical matters have a good memory of first semester physics. They studied force and acceleration; they learned about Newton and Kepler; they worked hard — and they used quite a lot of energy. In short, they learned the classics of classical physics. But did they learn about black holes? What about pair creation and annihilation? Did they touch the mind of Einstein or Lorentz? A UW-Madison physics major might give you an answer that surprises you.

Fall 2002 Physics 247 lab. Clockwise from the left, Brad Moran, Mike Schneider (TA), Ethan Kellogg & Katie Reinhart.

In the fall of 1999, the physics department decided that it was time to stir up its introductory course for majors. The result is a new three semester course sequence, "A Modern Introduction to Physics," and some new course numbers, Physics 247, 248, and 249. The ideas behind the class were simple. Teach modern topics as soon as the students can understand them. Increase the contact between faculty and students, and commit two faculty to teach a small class of potential physics majors. Use the time and talent of the faculty to blur the boundaries separating teacher and learner, and help the students to teach each other.

In the fall of 2002, the department is teaching "A Modern Introduction to Physics" for the third time. How is it going? Jessica Myrbo put it this way: "The physics 247-248-249 sequence is unquestionably the best intellectual and educational experience I have had. Since modern topics were introduced alongside classical ones, and examples from current research were frequently incorporated with textbook problems, all the subject matter became more interesting and comprehensible." So what is the new curriculum? Simply put, if they can learn it, we teach it. Once students understand Newton, they learn Einstein; special relativity is now taught in the first semester. Once they understand sound waves, they explore matter waves. In fact, electromagnetism is now motivated by the need to know what holds atoms together — not the other way around. Physics hasn't changed, but the students' perspective on it has. The new course sequence responds to that modern point of view.

The students seem to be excited, but are they learning any physics? Has something been lost in a "modern" approach? Maintaining high standards and a thorough treatment of the curriculum is one of the department's top priorities. Check the curriculum, and you won't find any gaps or holes. Has anything new been added? In terms of topics, the answer is no. Physics 247, 248, and 249 cover the same material as Physics 207, 208, and 241. In terms of the overall experience, many things are new. To the student, the most valuable change appears to be the closer contact with the faculty and the informal conversations that result.

The university and the department have a lot to gain from an enthusiastic group of physics majors. Are their numbers rising? It is far too early to draw firm conclusions, but the initial numbers are promising. Both Physics 311 last spring and Physics 322 this fall have substantially stronger enrollment than in previous years. At least in part, this increase is due to students who enjoyed their modern introduction to physics.

Who can you contact to learn more? The entire department has had a hand in crafting the course, and four faculty have taught the class so far: Don Cox, Mark Eriksson, Cary Forest, and Thad Walker. If asked, they will give you the details. If you probe more carefully, however, they will tell you the class is great fun to teach — in part because the students are so enthusiastic.

The final word should come from the students themselves, and Jessica sums it up nicely: "The most important thing I got out of the sequence was a concept of how to 'think like a physicist' (something I believe is rare at the introductory level). I would highly recommend the courses to any student with an interest in physics and in pursuing a related career or degree. The sequence answered (for me) one question I always hear: 'But why physics?'"

Fall 2002 Physics 249 class. Seated on the desk, facing the blackboard is Prof. Mark Eriksson.

GRADUATE PROGRAM

Graduate Program Report

by Barb Schutz

The Admissions and Fellowships Committee, under the chairmanship of Jim Lawler, is pleased to report that a total of 102 offers were made (76 domestic, 26 international) to this year's graduate program applicants. Acceptances number 36, including two new students who will be receiving WARF Fellowship supplements of $9,000 during their first year of study, one Advanced Opportunity Fellowship, one Chen Fellowship and one Herb Fellowship. Twenty-four of the incoming students are domestic, and twelve are international.

There were a total of 310 applications for admission (up 6% from last year) to the Physics graduate program. Of these, 111 were domestic and 199 were international. Offers were made to 85 males and 17 females, with 29 males and 7 females accepting.

We are seeing continued success of recruiting efforts instituted a couple of years ago — namely, with two group visit events in March, greater involvement of current graduate students, an increased financial supplement to all TA offers with a marked boost to our top applicants, and several summer RA offers to prospective students. Those unable to participate in the group events were given the option of an individual visit to campus. Additionally, Prof. Yibin Pan conducted telephone interviews with approximately ten Chinese students as part of the application process.

We invite you, as alumni, to encourage prospective graduate students to consider pursuing their studies here at UW-Madison.

Evelina Tsoncheva

Awards Honor Graduate Students

Evelina Tsoncheva won the Joseph Dillinger Award for Teaching Excellence in May, 2002. She has taught Physics 109, Physics in the Arts, for several semesters with top-notched evaluations!

Jennifer Sebby and **Angie Laird** submitted papers and won the Elizabeth Hirschfelder Graduate Women Awards. Angie Laird writes: "I grew up in central Florida, near Orlando. After graduating from Florida State University in Tallahassee, FL in 1998 with a degree in physics, I started graduate school at UW in the fall of 1998. I plan to graduate in December of this year."

Angie Laird

"My graduate work focuses on functional magnetic resonance imaging (fMRI) under the direction of Beth Meyerand (department of medical physics) and Bernice Durand (department of physics). fMRI has emerged as a useful and noninvasive technique for studying the function of the brain. Using magnetic resonance technology, researchers have found that it is possible to indirectly detect changes in oxygen levels of the blood that are a result of neuronal activation. This type of neuro-imaging is relatively new to neuroscience, and there remain many questions as to how these functional time series may best be analyzed. My thesis will concentrate on applying some of the ideas from the field of nonlinear dynamics to the analysis of the fMRI signal. I spend most of my free time training my dog, Gracie. We compete in flyball tournaments all over the Midwest and are currently preparing for our first agility trial."

Ali Soleimani and **Fan Zheng** won the Emanuel R. Piore Award, which is presented annually to recognize excellence on the Qualifying Examination. Congratulations to Ali and Fan!

Wisconsin Distinguished Graduate Fellowship Awardees

Shiue-Yuan Shiau has been awarded the Jeff and Lily Chen Fellowship for 2002-03, and **Srijit Goswami** is the recipient of the Raymond and Ann Herb Fellowship for 2002–03. Thanks to our donors for establishing some distinguished awards which allow us to bring in outstanding graduate students!

NEW PHYSICS PH.D.'S

August 2001

Jay Anderson

"Current profile measurement and studies of resistivity in the reversed field pinch" (Forest)

US DOD Postdoctoral Fellow,
UW-Madison, Madison, WI

Jason Breitweg

"Neutral current deep inelastic scattering at large momentum transfer with Zeus at HERA" (Smith), Germany

D. Matthew Feldmann

"Current flow in YBa2Cu3O7-X deformation textured coated conductors" (Larbalestier)

Jing Jiang

"Higgs and SUSY studies at linear colliders" (Han)

Postdoctoral Research Associate, Argonne National Laboratory, Argonne IL

Nikolas Kauer

"Finite-width effects in top quark production at hadron colliders" (Zeppenfeld)

Danny Marfatia

"New aspects of physics with extra dimensions" (Han)

Postdoctoral Research Associate, Boston University, Boston MA

Jason Nielsen

"Observation of an excess in the search for the standard model higgs boson at ALEPH" (Wu)

Postdoctoral Research Fellow, Lawrence Berkeley National Laboratory/Fermilab, Batavia, IL

Steven Watchorn

"The development of spatial heterodyne spectroscopy for observation of C IV emissions near 1550A from the cygnus loop and diffuse ISM (interstellar medium)" (Roesler)

December 2001

Rostyslav Boutchko

"Coupled dynamics of inert gases on crystal surfaces" (Bruch)

Postdoctoral Research Associate, UW-Madison, Medical Physics Department, Madison, WI

Young-Jae Kim

"Top quark physics in SEWS at future lepton colliders" (Han/Barger)

Seeking position in computer industry.

Yadong Li

"Computer simulation of linear and harmonic ultrasound imaging" (DeLuca/Zagzebski)

Consultant, Yahoo, Sunnyvale, CA

Christopher O'Dell

"A new upper limit on the large-angular scale polarization of the cosmic microwave background" (Timbie)

Postdoctoral Research Associate, Univ. of Massachusetts, Astronomy Dept, Amherst, MA

Katherine Rawlins

"Composition of cosmic rays with the SPASE and AMANDA detectors" (Karle)

Winter-Over Scientist, AMANDA, South Pole

Brian Schwartz

"Measurement of the nuclear polarization of hydrogen molecules formed by the recombination of polarized atoms" (Quin)

Visiting Assistant Professor, Carthage College, Kenosha, WI

Thomas Wright

"Parity violation in decays of z bosons into heavy quarks at SLD" (Prepost)

Postdoctoral Research Fellow, Randall Lab of Physics, Univ. of Michigan, Ann Arbor, MI

May 2002

Theodore Biewer

"Electron thermal transport in the Madison Symmetric Torus" (Prager/Forest)

Research Associate, Princeton Plasma Physics Laboratory, Princeton, NJ

Eric Charles

"A measurement of the CP parameter sin zp in bottom to charm-anticharm decays at BaBar" (Wu)

Research Associate, Livermore-Berkeley Laboratories, Berkeley, CA

Peter McNamara

"The search for the standard model Higgs Boson at ALEPH" (Wu)

Postdoctoral Research Associate, CERN, Switzerland

Zoran Skoda

"Coset spaces for quantum groups" (Chubukov)

Visiting Professor, Purdue Univ., West Lafayette, IN

Masters Degree Recipients

August 2001

Paul Cassak
Angela Laird
Matthew Wilson
Benjamin Wood

May 2002

Max Wyman
Kyle Cranmer
Thomas Heitmann
Ryan Miller
Jennifer Sebby

December 2001

R. Adam Bayliss
Patrick Ryan
Thomas Stone

AWARDS HONOR UNDERGRADUATE STUDENTS

Undergraduate/Faculty Hilldale Awards

Congratulations to **Sara Childs** and **Dan Shumow**, who under the direction of Brenda Dingus and Bob Joynt respectively, have won 2002–03 Hilldale Undergrad research awards.

L.R. Ingersoll Awards

L.R. Ingersoll Awards for distinguished achievement in undergraduate physics for Spring and Fall were awarded on May 10, 2002 at the Physics Banquet & Awards Ceremony at the Fluno Center. Awardees included:

Spring 2001	***Fall 2002***
Kristin Rieser	Brian Buckel
Kelly Peters	Daniel Sklansky
David Schuster	Dan Olson
Brit Lunde	John Lenz
Ben Cain	Kristin Morgenstern
Drew Keppel	

Albert Augustus Radtke Scholarship

The 2002 Albert Augustus Radtke Scholarship for distinguished achievement in the study of undergraduate physics was awarded to several physics students: **Alexandru Cabuz**, **Jason Haas**, **William Creighton Hogg**, **David Mulvihill**, **Jennifer Palguta**, **Moire Prescott**, and **Daniel Swetz**.

David Mulvihill writes: "I am a senior undergraduate student, graduating in May 2002 with a B.S. in physics and computer science. While I originally intended to solely pursue physics, it was my sudden fascination with computer architecture that I discovered after taking a course in the field that has led me to continue in graduate school for computer science."

"I will attend the University of Wisconsin-Madison this fall to do graduate study in computer science and computer architecture. While my specific interest in computer architecture is not yet well defined, I would like to explore the methods of exploiting instruction- and thread- level parallelism for billion transistor microprocessors. But who knows, if the field of quantum computing continues to advance, I may one day return to physics."

Jennifer Palguta says: "Born and raised in Vienna, Virginia, I attended James Madison High School, which is where my interest in physics began. Upon entering UW-Madison, I took classes in a number of academic areas, but found none as interesting as physics. Since declaring a physics major, I have declared a joint major in astronomy-physics. Both subjects fascinate me; both also offer me the possibility of an interesting and challenging career, one in which I can continue to grow and to learn. As such, after graduation next spring, I hope to attend graduate school in order to pursue a doctorate and eventually enter a career in research."

Jennifer Palguta

"To supplement my academic coursework, I've tried to gain work experience that would help me to better define my ultimate career goals. In the summer of 2001, therefore, I interned at the Nuclear Regulatory Commission in Washington, D.C., where I worked closely with health physicists. During the 2002 spring semester, I worked with Professor Christopher Anderson and Dr. Walter Harris, and have plans to do so again in the fall of 2002. Additionally, this summer I will participate in a 'Research Experiences for Undergrads' program in Northern Arizona University in Flagstaff. There, I will work with Drs. Bowell and Koehn at Lowell Observatory on the re-reduction of archived image of asteroids."

"All of my experiences at UW-Madison have been positive. Now, as I enter my last year of undergraduate study here, I am both honored and excited that I have been awarded the Albert Augustus Radtke Award. To be a recipient of the award is one of the highlights of my undergraduate career and something that I will value in the years to come."

Moire Prescott

Moire Prescott writes: "Between speaking French at the French House, working on galactic interaction with Professor Wilcots in the Astronomy Department, and

taking the typical array of junior-year physics and astronomy courses, it has been a busy year. I returned to campus in the fall after a year abroad studying anything but physics. Instead, my focus was political science, literature, history, and life in general in Aix-en-Provence, France. It was an amazing cultural and academic experience. At the same time, spending a year away from my major reaffirmed my desire to continue the study of astrophysics. For while I enjoyed my brief foray into the humanities, I found nothing as awe-inspiring and intellectually fulfilling as finding out the inner workings of the universe."

"This summer, under the direction of Dr. Stephen Tegler, I will participate in an REU at Northern Arizona University in Flagstaff, AZ. My work will primarily involve determining the colors, sizes, and rotation rates for several members of the Edgeworth-Kuiper Belt. A better understanding of the properties of this elusive group of objects will potentially shed light on the processes at work in the early evolution of the solar system. In the upcoming year, I will be completing an Honors Thesis on gas and stellar kinematics of Magellanic spiral galaxies and putting the final touches on my Astronomy and Physics degrees."

Fay Ajzenberg-Selove Award

The 2002 Fay Ajzenberg-Selove Award for outstanding undergraduate women majoring in Physics, Astrophysics or Astronomy had three winners: **Louise Helenius**, **Catherine Radomski** and **Erin Vanderpan**.

Here is the story of **Catherine Radomski**: "My name is Catherine Radomski and I am a junior here at the University of Wisconsin-Madison. I am planning to graduate in May of 2003 with majors in astronomy, physics, and mathematics. I have been interested in astronomy since second grade when my teacher would show every space shuttle launch that she could. Since then I have soaked up knowledge about space and astronomy in almost any form that I could. I joined the Young Astronaut club in grade school and when I joined 4-H in high school, I joined the astronomy project and worked with an astronomy teacher. I even was able to do science fair projects on light pollution and spectra."

Catherine Radomski

"Currently I work in the Observational Cosmology lab under Professor Peter Timbie and am looking forward to working on my senior thesis next year. This summer I am also working for Professor Jay Gallagher in the astronomy department on studying star formation in starburst galaxies. After graduation from here, I plan to go on to graduate studies working with the cosmic microwave background radiation. From there, my dream is to become an astronaut."

Erin Vanderpan writes: "I have been at UW-Madison for four years, working toward a double major in physics and violin performance. This coming year will be my fifth and final year here. Pursuing these two majors has been challenging and rewarding. Beyond class work here, I have worked at the Physics Library, and I currently work in the X-Ray Astronomy Laboratory in the Space Physics Department. I also play in the UW Symphony Orchestra, and toured Spain with them last summer."

Erin Vanderpan

"I have no concrete plans for the future, but I would like to find a path that will incorporate both physics and music. This year was a great year for me in both of these fields. Winning the Fay Ajzenberg-Selove award was a wonderful conclusion to this year. I am grateful for my friends, professors, and advisors, inside and outside the Physics Department, who continue to support all that I do."

Liebenberg Family Undergraduate Summer Research Fellowship

Our thanks go to the family of **Maude Liebenberg** and her son, **Don**. Because of their generosity, this Undergraduate Summer Research Fellowship was presented to **Andy Ruland** at the May awards banquet. This award provides funding to encourage undergraduates to become involved in summer research programs.

UNIVERSITY PHYSICAL SOCIETY

The Physics Club of University of Wisconsin-Madison, also known as the University Physical Society can be found at http://www.sit.wisc.edu/~ups/index.html.

Check it out!

They feature information on:

- Jobs: Job posting in the UW Physics Department
- Events: Upcoming UPS Events
- Officers: Your UPS Officers
- Research: How to find research opportunities
- About: What is the University Physical Society?
- Tutoring: We offer volunteer tutoring
- Humor: Bad physics humor
- Photos: Physics Club memories

They also provide links to The American Physical Society and the Society of Physics Students.

The officers for 2002–03 academic year are:

Chris Malec (President, Treasurer)
William Creighton Hogg (Tutoring Coordinator)
Sara Childs (ASM Liaison)
Alane Petrowski (Secretary)

UPS Officers 2002–03

Chris

Sara

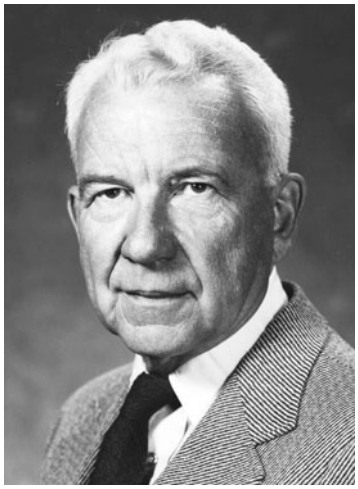
Alane

Creighton

DEFENDING FREEDOM OF SPEECH: WHAT HAVE WE ACCOMPLISHED?

June 10, 2001, *Physics Today*

The American Institute of Physics (AIP) and the American Physical Society (APS) have historically been committed to the free and open discussion of ideas. That commitment has been upheld by courts in Germany, Switzerland, the US, and finally in France following 12 years of challenges to it by Gordon and Breach Publishers (G&B). G&B's recent withdrawal of its pending appeal in France brings the challenges to an end. The AIP and APS passionately believe that the proper place to raise issues that involve substantive disagreements is in public forums, not in the courts. Although the legal battles meant tremendous costs — in both human and financial terms — we strongly feel we did the right thing for the right reasons. The societies can rightfully be proud of this victory.



Heinz Barschall

The source of the conflict involved studies of journal costs to libraries done by the late Heinz Barschall of the University of Wisconsin-Madison. His findings were published in articles in both PHYSICS TODAY (PT, published by AIP) and the *Bulletin of the American Physical Society* (BAPS, published by APS). Barschall received awards for his research from librarians but, unfortunately, did not live to see his final vindication in the courts. It is also unfortunate that threats of costly lawsuits have had a chilling effect on scholarly discourse related to journal pricing.

In a December 1986 article in PT, Barschall compared the unit prices — essentially the prices paid by US libraries per 1000 characters or equivalent — of a small group of physics journals. In two 1988 articles, one in the July issue of PT and the other (written with John Arrington) in the July/August 1988 issue of BAPS, Barschall expanded his study to include the relative cost-effectiveness of about 200 physics journals. His measure of cost-effectiveness was the ratio of journal price per 1000 characters to the published *Science Citation Index* impact factor.

G&B, which did not fare well in the comparisons, charged AIP, APS, and Barschall with false and misleading advertising, unfair competition, and related offenses. It also challenged Barschall's integrity and motives in conducting his research. Despite offers by AIP and APS to provide a public forum in their publications for both the societies and G&B to air their views, G&B chose instead to institute court cases against AIP and APS in Germany (1989), Switzerland (1989), France (1989), and the US (1993). Barschall was a codefendant in several of these cases. In every case, final decisions have now been rendered, upholding the accuracy and truthfulness of the articles. The US court also affirmed the freedom-of-speech rights of PT and BAPS to publish such reports. In addition, the US court case documented an international pattern of threatened lawsuits against those who compared G&B prices.

So what has been accomplished by the vigorous and successful defense of our right to publish reports about the pricing of physics journals? Clearly, we have defended our freedom of speech for articles that compare prices and are published and distributed in the US. We have also learned that, in foreign courts, defending the publication of such articles has even higher burdens. Foreign laws differ from US laws, and foreign courts often have a lower threshold for interpreting published articles as advertising, leaving those articles unprotected by freedom of the press per se. Advertising itself has standards of truthfulness, objectivity, and data relevance that may vary from country to country. In all the cases, we were found to have met the very highest of these standards, but it was a costly (millions of dollars) and complicated legal exercise. In a related instance, the American Mathematical Society (AMS) dropped its defense of a G&B suit in Germany because it felt that it could not afford the cost of defending its survey of journal pricing. Legal costs have only increased the burden to AIP and APS while the societies continue pricing their journals as low as possible for the widest dissemination of information. Such is the irony when the courts are the venue chosen to settle differences of opinion about reported data.

As the AMS and other documented situations illustrate, G&B was successful, for a while, in squelching comments on its pricing. So, does our successful defense mean that pricing data on journals for libraries and publishers can now be provided, and discourse conducted in the same venues used for other policy debates without fear of lawsuits? Let us hope so.

However, much has happened in journal publishing over the past 12 years. One event was the sale in February of the G&B physics journals to another publisher. But the main development has been the appearance and use of the World Wide Web as a vehicle for journal publication and public exchanges of opinion. The Web has led to a variety of complicated pricing options; it is likely that a latter-day Barschall would find it much more difficult to gather and organize pricing data. We do not know whether pricing comparisons will become moot or will be more subject to legal challenges. We shall see.

Both AIP and APS will continue to offer forums for discussion of issues related to scholarly publishing. We are proud of our role in defending the right of Barschall to publish his findings. The credit for victory goes to several members of the leadership of both societies, and to the societies themselves, which gave unstintingly of their time and money to pursue challenges in courts throughout Europe and the US. During this struggle, we have received not only consistent moral support from members of the academic library community, but also dedicated and knowledgeable legal support. We thank those who supported Barschall and our societies in upholding his integrity and competence, his right to have his say, and our right to publish his data.

Marc H. Brodsky
Executive Director
American Institute of Physics
College Park, Maryland

Thomas J. McIlrath
Treasurer and Publisher
American Physical Society
College Park, Maryland

SHELL OIL COMPANY FOUNDATION

Shell Oil Company Foundation Supports the University of Wisconsin-Madison College of Letters & Science/Department of Physics

Houston, Jan. 23, 2002

The Shell Oil Company Foundation has awarded $20,000 in two departmental grants to the University of Wisconsin-Madison, College of Letters and Science. The purpose of the Shell Departmental Grants is to strengthen activities in specified academic areas in colleges and universities with well-developed areas of teaching and research. The College of Letters and Science's Department of Geology and Geophysics used the funds to defray the costs of setting up a laboratory for a program in computational geochemistry/biogeochemistry. The Department of Physics has applied Shell funds to support increased stipends, comparable to that of peer institutions, for incoming graduate students. The Shell Foundation contributed $42,000 in departmental grants to the University of Wisconsin-Madison in 2001 in the following areas: mechanical engineering, chemical engineering, geology and geophysics, and physics. Overall, Shell giving in 2001 totaled $76,700. The Shell Oil Company Foundation focuses on making a difference in the communities where Shell people work and live. In 2001, the Shell Foundation awarded approximately $27 million in gifts to qualified organizations focusing on areas of civic and public policy, community involvement, culture and the arts, education, environment and health and human services.

The department is very grateful to Shell for their generosity.

Looking for a Classmate/Friend?

The Wisconsin Alumni Association has a feature to locate other Wisconsin Alumni. Check out http://www.uwalumni.com. Scroll to the bottom to locate "Find a Friend." You will need to set up an account, as this service is available to UW Alumni only. If you wish to call the University's Alumni Records Office to update your address, please contact them directly at 1-800-442-6469.

ENIAC OR ABC?

The review by J. Ross Macdonald and Harvey G. Cragon (*Physics Today*, July 2000, page 58) of *ENIAC: The Triumphs and Tragedies of the World's First Computer* seems to be an able assessment of the book and its content. However, perhaps due to misstatements in the book, the review fails to reflect adequately the place of the Atanasoff-Berry Computer (ABC) relative to the Eckert-Mauchly ENIAC in the lineage of the electronic digital computer. (See Alfred E. Brenner's article, "The Computing Revolution and the Physics Community," *Physics Today*, October 1996, page 24.)

Work on the ABC design by John V. Atanasoff (a University of Wisconsin Ph.D. physics graduate whose adviser was John Van Vleck) began in 1937 at Iowa State University (ISU). It is well established that a breadboard mock-up was completed in 1939 and that a full-scale prototype was being tested by early 1942. The review correctly indicates that, years later, Honeywell initiated a lawsuit claiming that ENIAC patents applied for by Presper Eckert and John Mauchly in 1947, though not issued until 1964 to Sperry Rand, were invalid.

On 19 October 1973, the trial judge entered his opinion, stating that "Eckert and Mauchly did not themselves invent the automatic digital computer, but instead derived that subject matter from one Dr. John Vincent Atanasoff."[1] Behind that terse statement is a trial record that exhaustively examines the "prior art" embodied in the ABC and the adoption in either ENIAC or the later EDVAC of many concepts first introduced in the ABC, such as regenerative memory, base-2 calculating, modular construction, and fully electronic computation.[2,3] (See also Alan R. Mackintosh's article "The First Electronic Computer," *Physics Today*, March 1987, page 25.)

Evidence introduced at the trial showed that, starting in December 1940, Atanasoff met with Mauchly, briefed him on the ABC design, invited him to Iowa to see the full scale machine under construction (he stayed at Atanasoff's home) and provided him with free and open access to detailed design features that later appeared in the ENIAC or the EDVAC. Nevertheless, many supporters of ENIAC's historical primacy still claimed that the court decision was flawed, that the ABC could never operate, and that the ENIAC did not, in fact, depend on the ABC design.

After 1973, Atanasoff began receiving widespread recognition for his accomplishment, including major awards from the Institute of Electrical and Electronics Engineers (IEEE) and the Navy, several honorary doctorates, and, in 1990, the National Medal of Technology presented by President George H. W. Bush.

In 1994, senior engineers at the Department of Energy's Ames Laboratory put forward the idea that the availability of ABC documentation and old parts could make it possible for them to build a full-scale replica of the ABC that might refute the charge that the ABC could never have operated successfully. A small group of ISU officials, of which I was one, then took on the challenges of project oversight and fundraising.

In late November 1996, the completed (but not yet operational) replica was unveiled in Pittsburgh, Pennsylvania, at "Supercomputing '96," an annual joint meeting of the IEEE and the Association for Computing Machinery. The ABC anchored an extensive display of historic supercomputer artifacts in celebration of 50 years of computer development.

By October 1997, all systems were fully operating and the machine was brought to Washington, DC. At the National Press Club, the ABC carried out its first public calculations before computer experts, ISU alumni, and the press. For the next eight months, the ABC toured Iowa, promoting ISU eminence in developing advanced technology. Along the way, some computing runs were videotaped, preserving a visible place in history for Atanasoff's dream. Ironically, the unattributed adoption of some of the ABC's concepts apparently provided the only means by which they were incorporated into the mainstream of computer development.

Joel A. Snow
Iowa State University, Ames (jasnow@iastate.edu)

References

1. *Section 3 of Judge Earl R. Larson's opinion in Honeywell Inc. vs. Sperry Rand Corp. et. al., 19 October 1973.*
2. *C. R. Mollenhoff, Atanasoff : Forgotten Father of the Computer, Iowa State U. Press, Ames (1988).*
3. *For an informative technical discussion of the ABC and the trial, see A. R. Burks and A. W. Burks, The First Electronic Computer: The Atanasoff Story, U. of Michigan Press, Ann Arbor (1989).*

LOCAL NEWS

Life after Physics

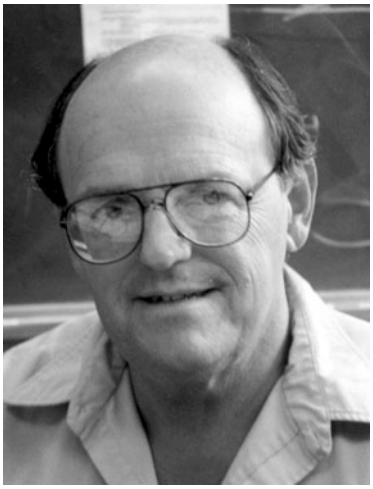
by Jean Buehlman

This morning as I took an early stroll, I watched my neighbor's garage doors open and close and got out of the way as they raced down the highway in their shiny SUV's. No, I wasn't envious at all. I simply continued my walk until I reached home, poured a cup of coffee and sat out on my deck to enjoy it, accompanied by my faithful cat. Don't get me wrong. I loved my job, but I thought it should be my duty to tell you that there really is life after Physics. Now I know that some of you won't believe me…you know who you are. But, you see I thought there might be hope for others. In case you didn't have the opportunity to read the last paragraph of my article in the 2001–02 The Wisconsin Physicist announcing my retirement, my successor, Mary Anne Clarke, invited me to address you again this year. Yes, on January 3, 2002, I became a whole new person — a retiree. Once again I must thank Physics for the great going away party they provided for me and the lovely gifts. They were very much appreciated. Following my retirement, my husband and I traveled for several weeks in the great American Southwest. We visited some very interesting country, including some spots I've never seen before, like the Gila Cliff Dwellings, Tucumcari Mission, and Canyon de Chelly. We also viewed those retirement havens of Palmer and Quartzite, AZ. We followed the Rio Grande from El Paso, TX to South Padre Island and spent some nice warm days on the beach. We returned to Madison in early February (much too early). Since that time, I've been busy painting and wallpapering our home, going on field trips with grandkids, helping an aging parent, and planning our next adventure vacations. Of course, there's the yard and the garden and the flowers and a few more rooms that could use paint. There's all those books to read and all those classes to take. I do miss my work friends, so if you are really alert, you just might catch me as I'm reaching my hand into my Physics mailbox or sticking my head into your office someday. It's been a pleasure getting to know all of you — faculty, staff, co-workers, alumni and friends. As I said, I really enjoyed my career in Physics. I'm sure you will be in equally good hands with my successor. Carry on and keep in touch. My email is buehlman@facstaff.wisc.edu.

Jean Buehlman at the Grand Canyon.

OBITUARIES

Kenneth Clarence Maas, Jr., Madison — Kenneth Clarence Maas, Jr., age 67, died on Monday, April 1, 2002, at the Don and Marilyn Anderson HospiceCenter, Madison. Ken was born on April 5, 1934, the son of Kenneth and Esther Maas of Burlington, Wis. Ken was raised in Burlington and graduated in 1952 from Burlington High School. Ken attended the Massachusetts Institute of Technology, served his country in the United States Army for two years and received a B.S. degree in Geology from the University of Wisconsin-Madison in 1959. Ken began his career at the University of Wisconsin-Madison, in February, 1963, and served as a Specialist with High Energy Physics until August, 1969. He served as the Physics Department Administrator from August, 1969, to September, 1971, and as Specialist from September, 1971, to January, 1975. He also served as Senior Instruction Program Manager from January, 1975, until his retirement with emeritus status on October 31, 1995. Ken enjoyed country living and was a longtime resident of Rio, Wis. Ken was an honest, quiet and friendly person who loved reading, photography, gourmet food, animals and the outdoors. Ken is survived by his brother, Keith and wife of Washington, D.C. Memorials may be sent to the American Cancer Society. *(from Madison Newspapers)*



Ken Maas

Prof. **Bunji Sakita**, former UW Professor of Physics, died August 31, 2002 at the age of 72. Prof. Sakita was an Assistant Professor at the UW from 1962 to 1964. He did research in theoretical physics and developed an international reputation for his work.

A former UW graduate student, **Nate Rodning**, died of a heart attack in April, 2002, at age 45. Nate was a UW graduate student in the early 80's, receiving his Ph.D. in nuclear physics in 1986. After leaving Madison, he went on to become a professor of physics at the University of Edmonton in Alberta, Canada, where he led a vigorous program of research in nuclear and particle physics. Nate is remembered for his enthusiasm for physics in particular and for life in general and Nate was devoted to his family.

MADISON - **Elizabeth Stafford Hirschfelder** died at home Sunday, Sept. 29, 2002, in Madison, Wis. She was born April 25, 1902, in Providence, R.I. She attended the Women's College of Brown University, now Pembroke College, receiving B.A. and M.A. degrees in mathematics in 1923 and 1924. She taught mathematics at Texas Tech University in Lubbock, Texas, beginning in 1925. She moved to Madison the next year to accept a fellowship with Professor Mark Ingraham, and she received her Ph.D. in mathematics from the University of Wisconsin in 1930. She taught mathematics at the University of Wisconsin for almost 20 years. With her first husband, Ivan Sokolnikoff, she co-authored an important textbook for engineering, "Higher Mathematics for Engineers and Physicists," first published in 1934. In 1953 she married Joseph O. Hirschfelder, professor of chemistry. She played a critical role in proofing and editing the famous textbook co-authored by her husband, Joe Hirschfelder, and his colleagues, Professors R. Byron Bird and Charles F. Curtiss, "Molecular Theory of Gases and Liquids." After Joe Hirschfelder established the Theoretical Chemistry Institute at UW-Madison, she and Joe helped launch many scientists while also nurturing their families. Beginning in the mid-1970s, Joe and Betty divided their time between UW-Madison and the University of California at Santa Barbara. As in Madison, they made many friends in Santa Barbara and contributed greatly to the exchange of scientific ideas. After Joe Hirschfelder died in 1990, Betty kept in close contact with many of his former students and colleagues. On one of her birthdays a friend, Laura Markus, wrote of Betty's "intellect and character, her courage, her adaptability in experiencing the different periods in her life… (as well as) her innate cheerfulness, her companionable ways, friendly laugh, and her abiding and kindly interest in other people." In April of this year close friends and family gathered in Madison to celebrate her 100th birthday. Among those present were Joe Hirschfelder's nephews, Professor George Akerlof (Janet Yellen) of Berkeley, Calif., and Professor Carl Akerlof (Carol) of Ann Arbor, Mich., as well as, Professors Curtiss and Bird, mentioned above, and other friends both long-standing and new. Those wishing to honor her may send donations to the Elizabeth S. Hirschfelder Fund for Graduate Women in Math, Chemistry, and Physics, care of the University of Wisconsin Foundation, PO Box 8860, Madison, WI 53708.

(from Madison Newspapers)

ALUMNI CORNER

Nicolle Zellner, B.S. 1993, recently (December 2001) received her Ph.D. in Multidisciplinary Science from Rensselaer Polytechnic (RPI) in Troy, N.Y. She is the first recipient of this degree and one of the first people in the country to receive a Ph.D. that focuses on the studies of the origin of life, a topic encompassed by Astrobiology. She's currently a post-doc at the NASA- sponsored New York Center for Studies, where she studies lunar impact glasses (found in the Apollo soil samples) in order to determine the impact flux of the Earth-Moon System and its implications for the origin and sustainability of life on Earth. She hasn't left Astronomy behind, though. She created and directed RPI's first Public Observing program, which utilizes the campus' 16" telescope (http://galileo.phys.rpi.edu), and she was recently appointed as a NASA/JPL Solar System Ambassador (http://www.jpl.nasa..gov/ambassador). She can be reached at nicolle@iris.phys.rpi.edu, and more about her research and interests after college can be found at http://www.rpi.edu/~zellnn.

Matthew A. Bernstein, Ph.D. 1985, and his wife, Rhoda, adopted a son from Korea in April 2002. Their new son, Lee, born August 2001, joins their two daughters, Juliet (16) and Sara (11). At the Mayo Clinic, where Matthew works in Rochester, Minnesota, Matthew was awarded a grant from the Whitaker Foundation in Biomedical Engineering for 2001–2004.

Jeff Chilton, Ph.D. 1999, is employed by the Center for Naval Analyses, based in Alexandria, Virginia, and is working as their field representative to Air Test and Evaluation Squadron One (AIRTEVRON ONE) at the Naval Air Warfare Center, Patuxent River, Maryland. He was involved with the testing and development of new systems and tactics for antisubmarine warfare. CNA is a federally funded research and development corporation that provides analytical support to the Navy, whose primary client is the U.S. Navy. As a field rep, Jeff acts as the science advisor to AIRTEVRON ONE, helping to develop models and test plans, and analyze data. During the past year, he has had the opportunity to travel, has spent several weeks aboard the aircraft carriers USS Enterprise and USS Theodore Roosevelt, both of which supported Operation Enduring Freedom. In addition to the pleasure of experiencing arrested landings onto, and catapult shots off of the carriers, he's also spent time in Hawaii and Puerto Rico. Jeff works with the Marine Search and Undersea Warfare team as an antisubmarine warfare analyst. He said that he enjoys his job, as it gives him a chance to apply physics to some challenging real-world problems. Currently, he's working for CNA's Combat Systems Team as a science advisor to a Naval Air Test Squadron. CNA always is interested in hiring folks with physics backgrounds, and he encourages anyone who's interested in using their physics degree in an unconventional setting to investigate a career with them. The CNA website, at www.cna.org has more details.

Douglas Keil, M.S. 1985/Ph.D. 1994, is currently the manager in the core technology group at Lam Research, Colorado, which manufactures (and develops) plasma etch equipment. He uses his plasma knowledge gained at Wisconsin in his work as an Industrial Physicist.

C. Thomas Sylke, B.S. 1982/J.D. Law School 1985, has his own law practice in Milwaukee, Wisconsin and works in the high technology patent field and represents various companies and other clients (including Stanford University). He returns to Madison as Director of Law School's Alumni Board of Directors and as a member of the Alumni Marching Band, among other things. He is attempting, unsuccessfully, to help UW establish a program to allow law students who wish to work in technology-related areas to study law and one or more areas of science (primarily physics and engineering fields) so that they are equipped to work with companies such as his firm represents.

Steve Grimes, Ph.D. 1968, has been named Distinguished Professor at Ohio University. This award is given to one member of the faculty each year and is awarded on the basis of career research accomplishments. Steve has been a member of the Department of Physics and Astronomy faculty at Ohio since 1981.

Herbi Dreiner, Ph.D. 1989, wrote to request that his web page be added to alumnus list: http://www.th/physik.uni-bonn.de/th/People/dreiner/

David Radzanowski, B.S. 1988, has been appointed chief of the OMB Science and Space Programs Branch, with responsibility for the budgets of NSF, NASA, and OSTP. He has been acting branch chief on a part-time basis for the last six months. Prior to OSB, he worked as an aerospace policy specialist at the Congressional Research Service. He has a graduate degree in public policy from Carnegie Mellon University.

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