The University of Connecticut

2152 Hillside Road
Storrs, CT 06269-3046

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Norman Ramsey,
Katzenstein Distinguished Lecturer
Friday, September 5, 2003

Professor Norman F. Ramsey, Emeritus of Harvard, will give the Katzenstein Distinguished Lecture on Friday, September 5, 2003. The title is "Exploring the Universe with Atomic Clocks." This talk is open to the public. Students in science and engineering are encouraged to attend.

Norman Ramsey received the Nobel Prize in Physics in 1989. His work has many theoretical and practical consequences. The Nobel Foundation has written "The work of the Laureates in Physics has led to a dramatic development in the field of atomic precision spectroscopy in recent years. The resonance method of Professor Norman F. Ramsey, Harvard University, USA, using separated oscillatory fields forms the basis of the cesium atomic clock, which is our present time standard. Ramsey and co-workers have also developed the hydrogen maser, which is at present our most stable source of electromagnetic radiation. The methods have been used in testing fundamental physical principles such as quantum electrodynamics (QED) and the general theory of relativity. Another application is in space communication and for measuring continental drift. The techniques have reached an unprecedented level of precision, and the development does not yet seem to have culminated."

Ramsey was a terrific student from the start, graduating from high school at 15. He went to college at Columbia, graduating in math, and again at Cambridge University, England, graduating in physics. He obtained his physics Ph.D. with I. I. Rabi at Columbia, using molecular beams.

During the Second World War, Ramsey worked at the MIT Radiation Laboratory, heading the group developing radar at 3 cm wavelength. He then served as radar consultant in Washington to the Secretary of War. Then he worked on the Manhattan Project in Los Alamos.

From 1947 he was at Harvard until retirement forty years later. With Daniel Kleppner, he invented the atomic hydrogen maser and made measurements of fundamental atomic properties that were unprecedented in accuracy. Primarily an experimental physicist, he pursues theoretical physics as a "hobby" and he has published in a great variety of fields of theory. He has won many awards in his illustrious career. Always generous with his time and attention, he gives credit to his many students and collaborators who continue to draw sustenance from their interactions with him.

2003 Charles A. Reynolds Distinguished Lecture in Physics

Professor **Steve Kivelson** from the University of California at Los Angeles presented the Charles A. Reynolds Distinguished Lecture in Physics on May 6, 2003. His talk was titled "Locally Crystalline Electron Liquids" and discussed a leading current theory concerning high temperature superconductivity. The presentation was insightful for the experts in superconductivity and entertaining as well as informative for those who are specialists in other areas. Those in attendance included undergraduate and graduate students, UConn faculty members from several departments and even visitors from other New England universities. Students and faculty participated in a lively discussion following the lecture.

Superconducting materials exhibit both zero DC electrical resistance and complete expulsion of small magnetic fields below some critical temperature, typically a few Kelvin. The phenomenon, discovered in 1911 by Kammerlingh Onnes, was initially described theoretically in 1957 in a breakthrough paper by Bardeen, Cooper, and Schrieffer (BCS). Some estimates based on the BCS theory predicted that superconductivity could not exist in any material at temperatures above 30-40 K, and indeed prior to 1987, the superconductor with the highest known critical temperature was Nb_3Ge at 23 K. However, in 1987 Bednorz and Muller shocked much of the physics world with their discovery of superconductivity near 40 K in a material containing planes of copper and oxygen. Other copper oxide planar materials were quickly discovered which are superconducting up to 150 K, notably $YBa_2Cu_3O_7$, the first material with a critical temperature higher than the boiling point of liquid nitrogen. Professor Paul Chu, the discoverer, was a previous Reynolds lecturer and a Master's Degree student of our own Professor **Joe Budnick**. Traditional theory does not describe the copper oxide materials in either the superconducting or the normal state.

A flurry of research work shows that the essential feature of these new materials is an abnormally strong Coulomb interaction amongst the conduction electrons, such that a complete many-body theory beyond the mean-field approximation is needed. A leading theory is that of Prof. Steve Kivelson, working mainly with the late Dr. Vic Emery from Brookhaven National Laboratory. According to this theory, the competition between electron spin interaction and charge repulsion is reconciled by having the conduction electrons spontaneously arrange themselves into

The Norman Hascoe Lectures on the Frontiers of Science

The Department of Physics has continued to play a leading role in a new lecture series funded by Mr. Norman Hascoe of Greenwich, Connecticut aimed at exciting undergraduates with scientific interests in frontier areas of science. Each lecture is open to the public and is followed by a reception and an informal panel discussion. In our fifth year, we had five outstanding lectures in the general field of nanoscale science:

1. Professor **Mark Reed**, Electrical Engineering and Applied Physics, Yale University, "Atomic and Molecular Scale Electronic Transport"
2. Dr. **Lov Grover**, Optical Science Research Department, Bell Labs,"Quantum Algorithms"
3. Institute Professor **Mildred Dresselhaus**, Physics and Electrical Engineering, MIT, "The Remarkable Structure and Properties of Carbon Nanotubes and Single Nanotube Raman Spectroscopy"
4. Dr. **Y. K. Chen**, High Speed Electronics Research Department, Bell Labs, "High Speed Optical Communication Devices for 40 Gbps and Beyond"
5. Professor **Rudy Grimm**, Institute for Experimental Physics, Innsbruck University, Austria, "Bose-Einstein Condensation of Ultracold Cesium Atoms"

Nanoscale science involves application of the concepts and techniques of physics to systems at a higher level of complexity (e.g. the supramolecular and macromolecular) and is the focus of major federal research funding initiatives. A comparably exciting lecture program for next year is being planned.

stripes, or rivers of charge. Under the proper conditions, conduction occurs along these charge rivers. When the charge stripes are not static but fluctuate, a superconducting ground state is favored.

In his lecture Prof. Kivelson made an elegant analogy between the nature of the electrons in these materials and the well known states of matter. We are familiar with crystalline solids, liquids, gases, and even intermediate states such as liquid crystals. In the theory of stripe-superconductivity, the electrons form a state where they are like a crystal over very short distances but flow like a liquid. The one-dimensional nature of the stripes makes them behave in a manner analogous to liquid crystals. This is a different concept and starting point from the traditional view that treats the electrons in a metal much like atoms in a gas. The theory may explain high temperature superconductivity and some other interesting situations such as quantum hall systems.

Prizes and Awards

Phil Best

The Katzenstein Prize for the best science essay by a graduating senior was won by **Ron Pepino** for his Honors Thesis, "The Weak Gravitational Field due to Electromagnetic Fields Generated by Particles." Ron intends to continue his studies in theoretical physics in graduate school. His advisor, Professor **Ron Mallett** called his student's thesis "outstanding and insightful," saying it "significantly contributed to an understanding of the role that is played by the energy of the gravitational field itself (essentially, the gravity of gravity) in addition to the energy of the electric field in general relativity. This contribution certainly justified Ron's being awarded the Katzenstein Prize." Two Rons make a rite (of passage).

Inductees into Sigma Pi Sigma, the physics honor society, were undergraduates **Mike Winninger** and **John Dimaria**, and graduate student **Ken Miller**. The Special Colloquium held on this occasion was presented by **Jochen Heisenberg**, Professor of Physics at the University of New Hampshire and son of Werner Heisenberg of Uncertainty Principle fame (amongst other things). His talk, "The Early Development of Quantum Mechanics," attracted many undergraduate students and filled the lecture hall.

Professor Heisenberg also presented a very well attended talk "Werner Heisenberg during the Third Reich" at the Thomas J. Dodd Center in the evening of May 1, 2003. In this talk the speaker discussed the questions surrounding the war-related activities of Werner Heisenberg, and made reference to the play "Copenhagen" by Michael Frayn that was motivated by these controversies.

The special colloquium was held in PB 38, in contrast to the regular colloquia of the Spring Semester that were held for the first time in BSP 130, an auditorium in the new Biology-Physics Building. This new building has a most impressive auditorium, and we invite our alumni to visit the building when they are next on campus and to see the results of the rest of the $1 billion building campaign.

The University of Connecticut Excellence in High School Physics Teaching Award went to **Julie Barker**, from Cheshire High School. Julie teaches the UConn Co-op Physics course, Advanced Placement Physics B&C, and an astronomy elective. Her students particularly appreciate the close coupling of lab with lecture, experiment with theory, which Julie brings about.

On December 4, 2002, **Dan Potrepka** (Ph.D. UConn Physics 1998) received a U.S. Army Research & Development Achievement Award, along with Steven C. Tidrow for work performed along with Arthur Tauber (Geosystems, Inc.) developing ferroelectric materials capable of achieving high tenability over the U.S. Military Specification Temperature Range(-50°C to 100°C) for phased-array antenna applications. Dan's investigations included studying the changes in the temperature dependence of the dielectric constant and its behavior under an applied electric field brought about by substitutions of pairs of ions into the Ti site of barium strontium titanate. The award was one of 29 presented in 2002 by the Army in recognition of outstanding scientific or engineering achievement and for contributions which improve the army's capability and enhance our national defense and welfare.

Susanne Yelin, just beginning her second year as an Assistant Professor of Physics, was presented with a $35,000 Research Innovation Award from the Research Corporation for her project "Reliable quantum communication with macroscopic light pulses."

Barry Wells, another fairly new recruit to the department from Brookhaven National Laboratory, won a Cottrell Scholar Award for his work "Interactive classroom for physics majors and interactive electrons in functional oxide films" in the amount of $75,000. Congratulations to you both!

SEVEN SAMURAI

Seven valued warriors of physics accepted Governor Rowland's proffered handshake. They will be honored at a dinner on September 19. We recognize them here by recounting a few career achievements for each. They all played vital roles in the department and some continue to do so. They have not yet laid down their swords.

Four have retired from their regular university positions at Storrs and have been appointed Research Professors of Physics. They are **Joe Budnick**, **Kurt Haller**, **Bill Hines** and **Quentin Kessel**.

After terms at IBM, Fordham University, including Chairman, and the National Science Foundation, Joe Budnick became Professor and Head of Physics at UConn. He is a Fellow of the American Physical Society and a member of the American Association for the Advancement of Science and of the New York Academy of Sciences.

Joe has numerous honors, distinctions and Visiting Professorships. Among his awards are the Alexander von Humboldt Senior U. S. Scientist Award (1986), the U. of Connecticut Award for Excellence in Science (1994) and the U. of C. AAUP Award for Excellence in Research (1999). His research spans a wide realm of condensed matter physics. The flowering of the Physics Master's Degree Program in Fairfield County with a Specialty in Optics occurred during his Headship.

Kurt Haller had stints at Rutgers, Columbia, Washington University and NYU before joining UConn in 1964. He served several times as Acting or Interim Department Head and, since 1998, as Associate Department Head for Graduate Education and Research. He is a Fellow of APS.

A highlight of his career was his honoring by a Festschrift published in Foundations of Physics, Vol. 30, # 3, 4, 5 (2000), to which numerous authors of world reputation contributed. His research is in Quantum Field and Elementary Particle Theories.

After positions at Berkeley, Harwell (England) and the Republic of China (Taiwan), Bill Hines joined UConn, where he has done Experimental Solid State Physics, particularly on magnetic materials. He has since spent many summers doing research in California.

His professional societies include Sigma Pi Sigma, APS, ACS and Sigma Xi. He belongs to the honor societies Phi Eta Sigma and Phi Beta Kappa. Bill continues to work out and does running and weightlifting.

Quentin Kessel worked at High Voltage Engineering Corporation, where he continued as a Consultant after leaving, and at U. of Aarhus (Denmark) before joining our department. He is a Fellow of APS and a member of the European Physical Society. Among other honors, he received an Alexander von Humboldt-Stiftung Fellowship for study at the U. of Freiburg, Germany (1977-78).

Quentin's research is in atomic, molecular and surface physics. His service to the University and to the professoriate is exemplary, as he has recently been President of the UConn Chapter of the AAUP.

Those retired from regional campuses are **David Bedding**, **David Madacsi** and **Gershom Foster**.

After working at the Woods Hole Oceanographic Institute and the Underwater Sound Laboratory, David Bedding taught at the Waterbury Branch. He is a member of APS and Sigma Pi Sigma.

His research was in atomic and molecular physics, and he had a notable collaboration with Tom Moran, who also retired from UConn. He served for many years on the Executive Committees of the AAUP, both the UConn Chapter and the Connecticut State Conference.

David Madacsi left Penn State U. to join UConn and teach at the attractive Avery Point Campus, where he eventually became Interim Director and, later, Professor of Physics and Director of Arts and Cultural Programs. He belongs to numerous organizations in the sciences and the arts.

His research has included natural lighting and the visual arts, optics and crystals, and solar energy conversion. Several times he was a Visiting Research Professor, Hungarian Academy of Sciences, Budapest.

Gershom Foster has been at the U. S. Army Electronic Proving Ground (Arizona), Cal State U. (San Francisco), U. of Toledo, JILA (Boulder, Colorado), finally being a Lecturer in Physics at the UConn Torrington Campus. To an extreme, this is our smallest branch, and Gershom was Mr. Physics in its entirety.

His memberships include APS and Sigma Xi. He has been very devoted to physics education during his 25 years with our department.

To The Seven Samurai

Don't turn in your swords
For rocking chairs. They
may prove
To be handy still.

The reception for our retirees will be held on Friday, September 19, 2003 at 6:00pm in the Shippee Banquet Hall. Please see our website or contact the office for details.

Creating a Paperless Classroom

George Gibson

Managing a large physics class involves a lot of paperwork, especially quizzes and homework. Collecting, grading, and returning this work requires a lot of time. Moreover, grading large amounts of homework cannot be done both carefully and efficiently. To provide better feedback for students, several faculty in the department have begun using electronic methods for giving homework and quizzes. An online homework delivery package, WebAssign, has been particularly successful. WebAssign consists of a database of homework problems from nearly all of the standard undergraduate physics textbooks. Thus, professors can use problems that they are familiar with. However, rather than turn in the solutions to the homework, the students enter the answers on line. Once the answers are submitted, the students can immediately see which problems they got right and which ones wrong and can be given the opportunity to revise their answers. This encourages the students to keep working on problems until they get them right.

Cheating with such a system is an obvious concern. To make cheating harder, the web-based program randomizes the numbers in each problem so that each student actually receives a unique problem. One student complained in class that this means they can talk about how to do the problems only by getting together. Comparing answers won't do! The immediate feedback benefits not only the students, but the professors, as well. After the due date, the professor can look up statistics on the class to see how they did on each problem. If the class did poorly on a particular problem, the professor can immediately address the issue before going on to new material, rather than a week or two later when homework is usually returned.

To provide even more immediate data on students' understanding of the material, one professor has tried a new system in which each student is provided with an IR transmitter with a unique serial number. During class, the professor can stop and ask a multiple-choice question. The students then beam in their answers to a computer, which instantly displays a histogram of the responses. If most of the class got the correct answer, the professor can move on. If there was a lot of confusion on a certain question, the professor can address the problem right away. Since the computer can keep track of each student's response, quiz credit for the class can be based on this system. During one semester, this system was used daily, and the attendance rate was over 95% for the entire semester - a phenomenally high number for this particular course sequence.

Besides the pedagogical advantages of these new teaching technologies, the computer savvy students are quite comfortable with them and said that they make the class much more enjoyable.

Trading Spaces

After many years in the making, the Biological Sciences/Physics (BSP) building was dedicated this spring, and we are already holding classes and lectures in its two large new lecture halls. The final outfitting of our five large physics labs is being completed during July and August. Turner Construction is doing an impressive job of customizing the labs for their varied uses, including the construction of small clean rooms, storage areas, and the infrastructure needed for numerous optical tables.

We will begin moving research groups into the new space on the week of August 15. By late September, the laboratories of Professors **Gould**, **Gibson**, **Wells**, **Dutta,** and **Sinkovic** will have been completely relocated. They are looking forward not only to the larger labs, but also to much-improved climate control and building services. Approximately twenty graduate students, postdocs, and faculty members will also be moving to the new space.

Subsequently, we will take advantage of the opportunity to rearrange the offices and labs that remain in Gant, allowing all of us the space we need to do our work more efficiently. We plan to create a long-awaited graduate student common room, expand the teaching laboratories back to their original scope and beyond, and make numerous other improvements in office and lab allocations. The department will be looking very different this fall!

Teachers For a New Era

The University of Connecticut has been named as one of seven recipients of a $5 million (each) Carnegie grant to train teachers for a new era. The NEAG School of Education and the College of Liberal Arts and Sciences are jointly responsible for the grant, and collaboration between members of those entities will be a feature of the venture.

Input to the proposal from the Physics Department mainly centered on the new course for preservice elementary school teachers, Inquiry-Based Physics to be taught by **Phil Best**. David Moss of NEAG fully supports that course, and is recommending that his advisees take it. Students in the course learn by doing: most of the four credits are earned in the six hours of lab per week. The National Science Foundation and the National Academy of Sciences both advocate this method of instruction for school children, and for their teachers. The latter extension is included because most teachers "teach as they were taught."

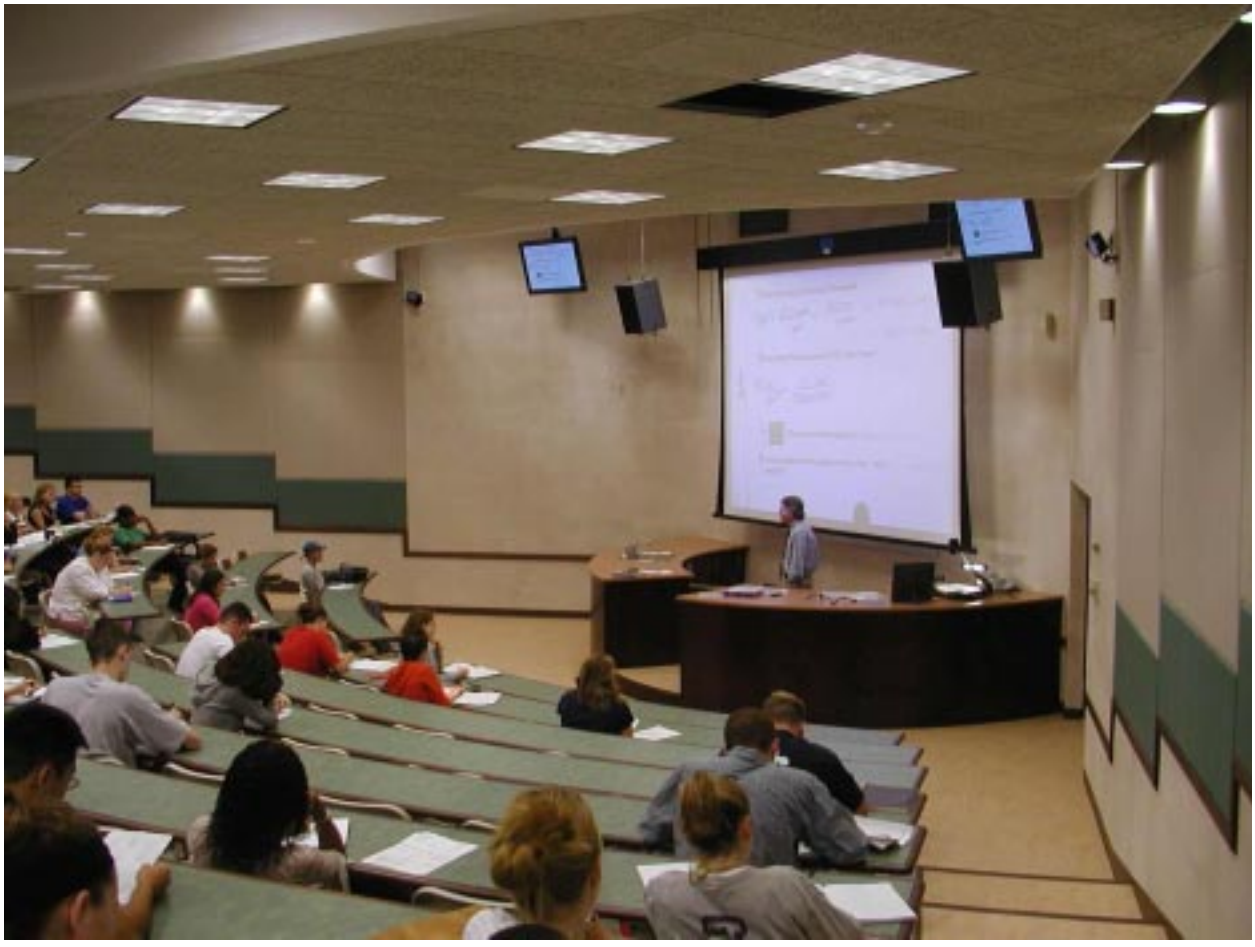
PB36 in a New Light

The storied and now newly renovated PB-36 lecture hall opened for business at 8 am on Wednesday August 28, 2002 as Professor **Douglas Hamilton** presented a Physics 101 lecture to about 150 students. Later in the day, Professor **Larry Kappers** gave his own version of "Welcome to Physics 101" while Professor **Cynthia Peterson** began her popular Physics 155 Astronomy course the following day. The renovations to this 30-year-old classroom were transformative, structurally and infrastructurally. Gone are the creaky wooden chairs, the stained and tattered "harvest gold" carpet, and the woefully inadequate lighting. In their place is a bright and functional classroom which is much more conducive to both good teaching and lasting learning. According to facilities operations, UConn spent $733,000 to do it.

The most significant change is the state-of-the-art audio-visual capabilities in the renovated classroom. The high tech and multimedia equipment include a AMX touch-screen, document camera, desktop computer, laptop computer ports, slide projector, VCR with TV tuner, DVD player and a complete audio system. The touch screen is the command center and allows the professor to select input source (document camera, computer, etc.) and output (the large video projector or the 42-inch plasma display panels). "The first month was pretty exciting," quipped Prof. Peterson. "The video projector bulb burned out twice with no replacement on campus, the front electrical outlets had not been wired up, the white boards were a foot too high, and the light dimmer controls didn't work." But perseverance won the day as Profs. Hamilton and Kappers adapted their overhead transparencies to the new video projection system and document camera.

"Good teaching is not a hardware issue," commented Prof. Hamilton. "But this new technology does provide for several creative ways to address various shortcomings of the chalk-and-blackboard physics lecture. I am particularly excited about being able to supplement our traditional lecture demonstrations with video we have created using iMovie™."

UConn now has 65 high tech classrooms and there is much hope that someday soon PB-38, the most widely used physics lecture hall, will also undergo renovation. Notes Professor **Phil Best**, "These classroom improvements can enhance how we teach physics in a very profound way."



NASA Funded Collision Studies

Professors **Quentin Kessel**, **Edward Pollack**, and **Winthrop Smith**, along with Dr. **Thomas Ehrenreich** and two of our graduate students, **Phil Gee** and **Ken Miller**, are working on a NASA-funded program. The research involves laboratory simulations of collisional processes that result in soft x-ray emission analogous to that observed from comets and optical emissions similar to those found in the Io (a Jovian Moon) plasma torus.

In 1996 the ROSAT Satellite observed soft x-ray emission from Comet Hyakutake. The presence of these emissions was unexpected but it is now established that all comets emit x-rays. Models have been proposed to account for these data; the most promising one attributes the observed x-rays to interactions between highly-charged ions from the solar wind and molecules in the cometary "atmospheres." Examples of important highly charged solar wind ions are O^{6+}, O^{7+}, and C^{5+}. H_2O is the dominant volatile species accounting for about 80% of the cometary atmosphere. Other molecules found in comets include CO, CO_2, CH_4, NH_3, and N_2. X-ray emission is attributed to electron-capture collisions, such as $O^{6+}+CO \rightarrow O^{5+*}+CO^{+}$.

The excited O^{5+*} then decays, to the O^{5+} ground state, by emitting characteristic x-rays and optical photons. The Io plasma torus (where H^+, O^+, and S^+ ions dominate) was also found to emit radiation at UV and optical wavelengths.

The experimental aspects of this research include measurements (at the "Atomic Collisions Laboratory" of NASA's Jet Propulsion Laboratory (JPL), Pasadena, CA) of the total collision cross sections for one- and two-electron capture by multicharged ions from atomic and molecular targets, and studies of the collision-induced soft x-ray spectra (using a University of Connecticut soft x-ray spectrometer mounted on a beam line at JPL) and optical spectra (in our Van de Graaff Laboratory).

A Brief History of the Time of Manasse Mbonye (UConn PhD, 1996)

(This profile of an alumnus shows how will and resourcefulness overcame the most severe obstacles.)

Manasse was born in the East African country of Rwanda. He moved to Uganda (mid 60s) at an early age, along with his parents and tens of thousands of other Rwandese escaping political persecution. He grew up in a refugee camp in Uganda.

In the 70s his schooling was interrupted by Idi Amin's murderous regime. He moved to neighboring Kenya as a refugee, the second protracted interval in that status. In Kenya he strove for ten years to obtain sponsorship to continue his studies. In 1983 he was admitted to Fourah Bay College, Freetown, Sierra Leone, under a World Council of Churches Scholarship.

In January 1986 he moved to Slippery Rock University, Pennsylvania, USA, under the African American Institute (AAI) Scholarship. When he graduated (1987) with a BS in physics, he owed a tuition balance of about $700, so could not get academic transcripts to support his applications for grad school. Only Wayne State University, Detroit, was willing to admit him provisionally.

At Wayne State (1988-90) he wanted to do astrophysics but there was no advisor there. Professor **Ron Mallett** met Manasse

at a conference in early 1990 and invited him to UConn, where he spent 1990-95 and graduated in May, 1996, with a Ph.D. in physics, specializing in general relativity. He was honored at graduation by being the Ph.D. banner-carrier for his contributions to university society and for his launching of the Rwanda Education Reconstruction Effort (RERE) at UConn.

As a lecturer at UConn he taught at Storrs, Stamford, Avery Point and West Hartford. In 1997 he began a physics post-doc at University of Michigan, Ann Arbor, where in 2001 he became a Visiting Assistant Professor of Physics and established a record of excellence in teaching.

Since June, 2003, he has a full-time faculty position at the Rochester Institute of Technology (RIT) in Rochester, NY, continuing his research in astrophysics and cosmology. His recent proposal earned a Senior Research Associateship award from the National Research Council. This pays for his upcoming year at the NASA-Goddard Space Flight Center, Greenbelt, Maryland. Along with research lectures at institutions around the world, he has given popular public talks on black holes before live audiences and television audiences in Michigan. Videotapes of his talks are used by teachers of basic physics. Manasse often visits UConn, where he has many friends.

Unusual Careers for UConn Physics Ph.D.s

Since the fall of 1999, Dr. **G. Robert Wein** (1992) has been a physics teacher at St. George's School in Newport, Rhode Island. He writes, "It is a boarding school (grades 9-12) situated on a hilltop overlooking the ocean, and with 325 students from over 20 countries and 30 states, the atmosphere is quite unique. I teach four classes (two sections of AP, general and introductory), coach two sports (soccer and softball) and live in a dorm with my wife, two daughters and thirty-five teenage girls. The schedule is rather hectic, with classes and athletic practices six days a week and two or three nights of dorm duty.

"Why give up a university position for all of this? The answer is in the students. My classes average eleven students, and almost all of them are energetic and motivated. One of my advisees finished AP Physics, AP Chemistry and AP Calculus as a sophomore, so for this year and next he will work with me on special topics and projects. And another unusual senior has asked to borrow my copy of Lorrain and Corson!

"The contact in and out of the classroom gives me the ability to get to know my "kids" in an unusually close manner. The lifestyle demands aren't for everyone, but the rewards can be great!"

Amanda Woods earned her Ph.D. with **Ralph Bartram** in 1991 and **Steve Blechner** earned his with **Paul Klemens** in 1990.

"We were married while vacationing in New Mexico in 1995 and live in West Bridgewater, Massachusetts. We have a four year old son, Dylan Jack." Amanda is a tenured full Professor at the Massachusetts Maritime Academy (www.maritime.edu) on Buzzards Bay, a four-year state college specializing in the education of merchant marines. She has taught at the Academy for 10 years, 5 of which she participated in the "semester at sea," teaching aboard a training vessel and visiting such ports as Amsterdam, Edinburgh, Barcelona, Naples, St. John and even those in Costa Rica. She enjoys her work tremendously.

Steve trained as a postdoc at Los Alamos National Laboratories, studying proteins using x-ray and neutron scattering. He then started the Molecular Computing Facility at Harvard and Beth Israel Hospital. He left for the pharmaceutical industry to become the Director of Scientific Computing. In 1999 he was awarded a Chartered Financial Analyst certification after a six-year program in quantitative finance. He is currently on sabbatical from his two businesses, SB Investment Management, focusing on financial analysis of high tech and biotech companies, and HobNob Industries, a software development company specializing in computational Molecular Biology issues. At present he plays drums for a Boston-based band and connects with his son.

"We keep in touch with many colleagues from UConn; **Arnie Russek**, Bob Wein, **Dave Perry**, **Chuck Tapalian**, **Fran Rogomentich**, **John Charpie**… we would love to hear from any long lost friends…" - awoods@mma.mass.edu, hobnob@aol.com

Edwin Lombridas came to the Physics department in 1988 as a Ph.D. student in the particle theory group. After graduating in 1996, he joined the Guardian Life Insurance Company of America in New York City where he quickly advanced from a Junior Actuarial Analyst to a Senior Project Manager of the Business Technology unit of the Group Medical division. In addition to database application development, his present responsibility includes preparing in-house technical training materials and teaching Visual Basic and SQL programming classes.

Edwin was never "into" computers until he came to UConn. He said he was enticed to use a personal computer by the program Expressionist – an Equation Editor for the Mac. Later, as **Kurt Haller's** graduate student, he worked on the canonical quantization of (2+1) –dimensional gauge theories with the use of symbolic manipulation programs to perform the often tedious calculations. With **Juha Javanainen** as motivating force, Edwin wrote an operator manipulation subroutine in Mathematica.

Edwin wanted to stay in academia. After unsuccessful tries for two years, he sought an alternative career, programming in a financial institution or in an internet company. The hardest part of his search was repackaging his skills in his resume to get to an interview. With his revised version, he received four interviews in three months– one with Guardian Life.

At Guardian Life, Edwin started as a junior analyst running canned programs and reports built in a dying platform. Realizing that those programs and reports could be written better using a new software, he took on the challenge and impressed his supervisor with the new applications just six months later. Although his job is totally unrelated to physics, Edwin attributes much of his success in his new career to his physics training. Physics enables him to see and to solve problems very differently from everybody else. "Anyone can learn an array of programming languages, but you cannot learn how to solve problems. That takes experience. And, in physics, you solve a lot of problems."

Henry Sour Katzenstein
1927-2003

Henry Katzenstein, who died January 10, 2003, was the first student to receive a UConn Ph.D. in Physics (1954) and a role model for generations of UConn Physics students. He was a highly intelligent individual, yet he was also modest, generous, personable and highly respected by those who came to know him. He and his wife Connie gave generously through an endowment which has enriched the UConn Physics community and will continue to do so.

Henry's academic career began at Duke University (interrupted by service in the Navy during World War II) and continued at the University of Chicago where he earned a bachelors degree. Most notably, Henry entered the new graduate program at UConn becoming the first Ph.D. in Physics in 1954. After a postdoctoral fellowship at MIT, he began an illustrious career in industrial research and management, working in succession for Olympic Radio and Television in New York, and Solid State Radiations (Vice President) and Quantrad Corporation (President) in California. He then founded Brooktree Corporation which became a leading producer of analog-to-digital converters for computer graphics. Finally, in 1992 he switched fields to agriculture by starting Greenhart Farms where he used innovative methods to grow a significant fraction of the seedlings in California for several different crops.

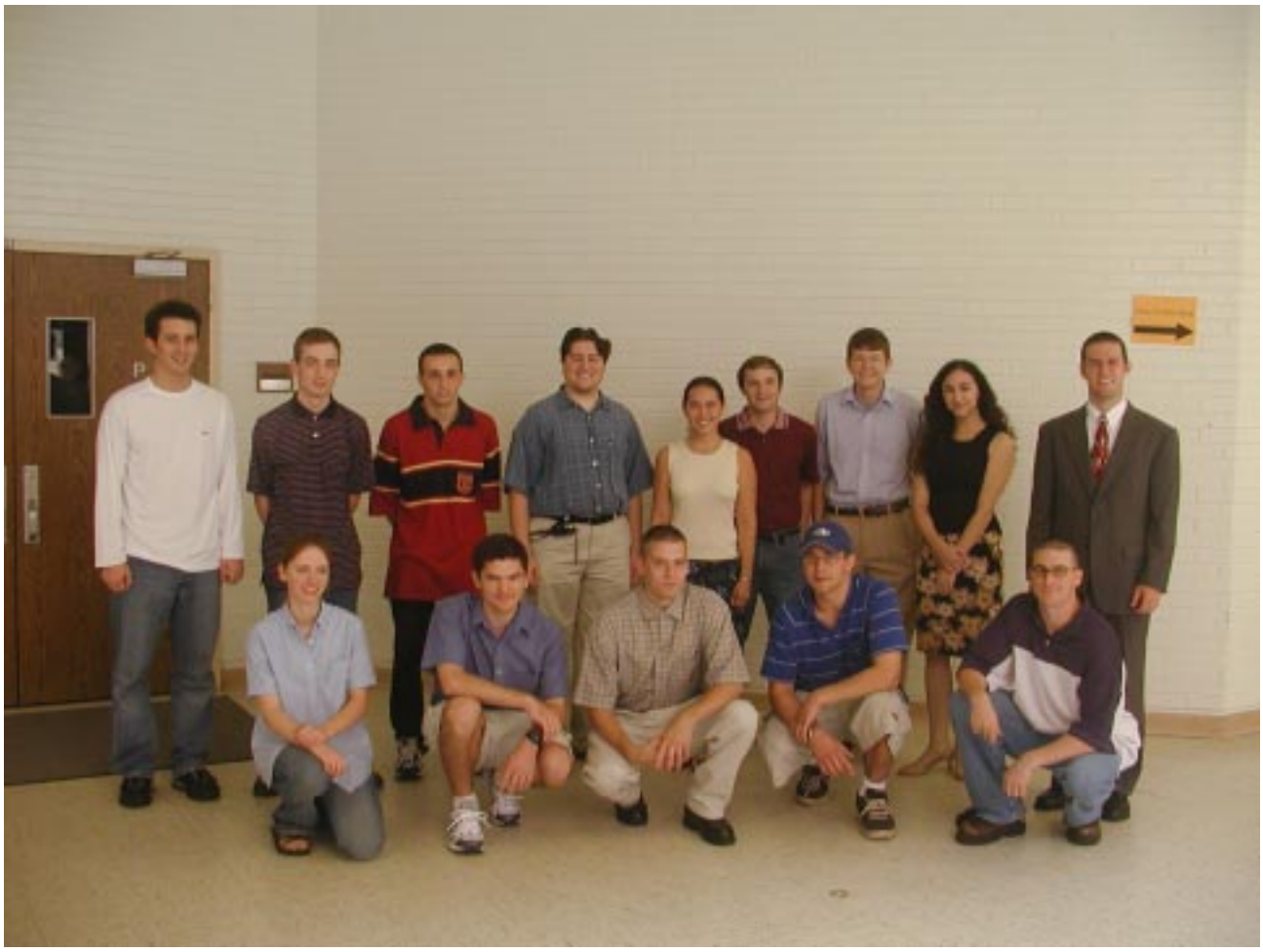
Henry remembered fondly his days at UConn and consequently did much to help the department. In 1987, he funded the Stephen Friedland Memorial Lecture in honor of his UConn mentor. He helped us celebrate 50 years of Physics graduate studies at UConn (1990) with a stimulating lecture on "Physics of the Compact Disc"; moreover, he used the honorarium for his lecture to initially fund the annual Katzenstein Prize for Undergraduates. In 1996, he established the Katzenstein Endowment to fund the annual Katzenstein Distinguished Lecture, as well as the annual Prize and possibly departmental initiatives in the future. He and his lovely wife, Connie, began a series of annual fall visits to Connecticut for these lectures, given by some of the most eminent and innovative physicists anywhere: 1997-David Lee (M.S. UConn, 1956) of Cornell, 1998-Bill Phillips of NIST, 1999-Horst Störmer of Columbia, 2000-Jerry Friedman of MIT, 2001-Alan Heeger of the University of California at Santa Barbara and 2002-Eric Cornell (NIST and the Univ. of Colorado) The 2003 lecture will be given by Norman Ramsey (Harvard) (see cover page). All seven lecturers are Nobel Laureates. These lectures are the highlight of our academic year and the interactions of the students, faculty, the lecturer and Henry were marvelous; David Lee commenting "how much he enjoyed interacting with Henry" in particular. We very much hope that Connie continues her fall visits to Storrs.

Henry Katzenstein was a most remarkable man. We at UConn are extremely proud and appreciative of Henry Katzenstein as a scientist, an entrepreneur, a benefactor and a friend. We miss him.

RICHARD RHODES, IN MEMORIAM

Richard A. Rhodes II died in St. Petersburg, Florida, May 9, 2003, at the age of 81. He taught in our department for some fifteen years principally as Instructor, until he received his Ph.D. at Brown University around 1962. He had also worked in the Sound Division of the U.S. Naval Research Laboratory and served in the U.S. Naval Reserve, from which he retired in 1972 as a Commander.

Richard taught for four years at the University of Florida in Gainesville. In 1966 he joined Florida Presbyterian, now Eckerd College, and retired as Professor of Physics in 1994. He was involved in many civic activities and was particularly active in water safety programs.



Back Row: Patrick Meinel (Juha Javanainen), Richard Forziati (Niloy Dutta), Edli Papadhima (Sal Fernandez), Michael Rosenkrantz (Ed Eyler), Jonelle Walsh (Cynthia Peterson), Andrew Scott (William Stwalley), Jeremy Ouellette (Winthrop Smith), Rebecca Cremona (Susanne Yelin), Jeffrey Levinson (Phil Gould) Front Row: Melissa Grakowsky (Barry Wells), Zachary Huard (Robin Côté and George Rawitscher), Anthony Palladino Jr. (George Rawitscher and Robin Côté), Chris Gauthier (Richard Jones), Clayton Radei (Phil Best)

2003 Research Experience for Undergraduates

We had a talented group of participants in this year's Research Experience for Undergraduates (REU) Program. The program, funded by the National Science Foundation, is intended to give students experience working in a research environment and hopefully entice them to go on to graduate school. PI for the program in UConn's Physics Department is **William Stwalley**; co-PI is **Cynthia Peterson**; members of the Organizing Committee also include **Ron Mallett**, **Niloy Dutta** and **Elizabeth Taylor-Juarros**.

This year's program included organized events such as the weekly Careers in Physics luncheons and Frontiers in Physics colloquia. The last major activity in the program was the poster session which was well attended and full of exciting science and vigorous discussion. Pictured above are the students (advisor's name in parentheses) at the poster session.

A NEW ENDOWMENT AND A MAJOR GIFT!

We are very pleased to report that the late Marshall Walker's children are in the process of establishing an endowment to maintain and fully fund the "**Marshall Walker Teaching Award**" in memory of Marshall and his late wife Georgianna Walker. This award is presented annually to an outstanding graduate teaching assistant who is deemed to have done the best job of teaching and encouraging students to learn physics during the year. Many thanks go to Patricia Ducharme of Chaplin, Connecticut, and Robert S. Walker of Blue

Hill, Maine for their generosity.

We are also very pleased to report that **David Lee** (M.S. 1956; Professor of Physics at Cornell and Nobel Laureate) has generously funded a major gift to our department by adding to the Katzenstein Endowment through the Marvin/Annette Lee Foundation, which he founded in honor of his parents. The Katzenstein Endowment, funded primarily through the generosity of Henry and Connie Katzenstein and supplemented by gifts from department members and others and matching funds from UConn 2000, funds the annual Katzenstein Distinguished Lecture and the annual Katzenstein Prize (for the best undergraduate research paper). It also formerly funded the above-mentioned Marshall Walker Teaching Award and initiation banquet meals for new Sigma Pi Sigma inductees; other departmental initiatives will be funded in the future by the Katzenstein Endowment, with its largest supplemental gift ever from David Lee significantly enhancing its annual income.

"Still maturing," are **the Isaac S. and Lois W. Blonder Graduate Fellowship in Physics** and the **KMS Nagavarapu Graduate Award in Physics**. These are newer endowments and may not be drawn on until their incomes have accumulated for three years. We are eager to provide our top graduate students with supplements from these funds.

We are also pleased with the thoughtfulness of others of you who are making a significant difference to our department. The form on the bottom of this page is intended to prompt further generosity! If you are one who contributes to the more general requests made by the University, we would be delighted if you would direct such contributions to the Physics Department! Using the fund numbers from the form below will ensure that your contribution goes where you intended. These contributions make a world of difference to us, both to our morale and to our effectiveness.

I/we are interested in supporting the Physics Department programs. Please direct my gift of $_____ to:

- Katzenstein Distinguished Lecture Series Endowment (30438-2014)
- Charles Swenberg Memorial Endowment (30641-2014)
- Isaac S. and Lois W. Blonder Graduate Fellowship Endowment (30743-2014)
- KMS Nagavarapu Graduate Award Endowment (30723-2014)
- Physics Department Unrestricted Fund (20555-2014)

Matching Gift

- I work for a matching gift company. The form is enclosed.

My company is: _____

_____

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phone/fax _____

Please send your contribution directly to the

University of Connecticut Foundation
2390 Alumni Drive
Storrs, CT 06269-3206

Thank you for your support!

Any news about yourself that you are interested in sharing? We have enjoyed the unsolicited mail we received as a result of our last newsletter so now we're actively soliciting. Please send suggestions to:

David Markowitz, Editor
at Department address.

(Folding both ends of this sheet in will turn the response form into a mailer.)

From:

Professor Quentin Kessel, Ph.D. UConn '66
University of Connecticut
Department of Physics
2152 Hillside Road
Storrs, CT 06269-3046

SAVE THE DATE
September 5, 2003

Invitations for the Katzenstein dinner have gone out to those of you with New England, NY, NJ and PA addresses. If you are interested in attending and live outside of this area, please contact Kim Giard at 860-486-4924, email: kim.giard@uconn.edu for an invitation.