

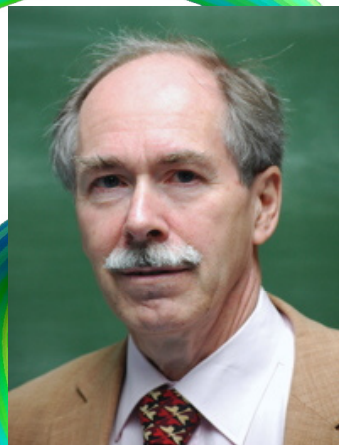
# The University of Connecticut

*College of Liberal Arts and Sciences*

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## DEPARTMENT OF PHYSICS NEWS

*Volume II  
Issue 2  
August, 2011*



### Gerard 't Hooft, Katzenstein Distinguished Lecturer

**Friday, November 4, 2011**

Nobel Laureate Professor Gerard 't Hooft of the Spinoza Institute at the University of Utrecht in the Netherlands will deliver this year's Katzenstein Distinguished Lecture on Friday November 4, 2011. In 1999 Professor 't Hooft shared the Nobel Prize in Physics with Professor Martinus Veltman "for elucidating the quantum structure of electroweak interactions in physics".

In 1955, Yang and Mills introduced a gauge theory that generalized electromagnetism to internal symmetries. This theory gave rise to the Higgs mechanism in 1964 and the Weinberg-Salam-Glashow theory of weak and electromagnetic interactions in 1967. However, standing in the way of taking these theories seriously was that it was not known how to eliminate the infinities that these theories possessed (the renormalization problem). Then, in 1971 Professors 't Hooft and Veltman solved the problem and showed that the infinities could all consistently be removed. Remarkably, Professor 't Hooft was a graduate student at the time. The work ushered in the modern era of gauge theories. So successful was their work that it immediately spawned quantum chromodynamics, the Yang-Mills gauge theory of interacting quarks and gluons that serves as the fundamental theory of the nuclear force. Extending the work of Professors

't Hooft and Veltman, in 1973, Professors David Gross, Frank Wilczek and David Politzer showed that Yang-Mills gauge theories possessed the unexpected and unusual property of being asymptotically free, work for which they eventually shared the 2004 Nobel prize. Professors Gross and Wilczek have both been Katzenstein lecturers here at the University of Connecticut. As well as providing the seminal steps toward establishing the physical viability of gauge theories, Professor 't Hooft has been very active in the even more challenging problem of understanding quantum gravity and the interplay of quantum mechanics with black holes. In his Katzenstein lecture Professor 't Hooft will talk about such fundamental issues.

Professor 't Hooft did both his undergraduate and his graduate work at the University of Utrecht, receiving a Ph. D. in 1972 for his thesis "Renormalization Procedure for Yang-Mills Fields." From 1972 to 1974, he was a Fellow at CERN, Geneva, Switzerland, before becoming an Assistant Professor at the Institute for Theoretical Physics at the University of Utrecht. In spring 1976, he was the Morris Loeb Lecturer at Harvard University, and that fall, he was a researcher at the Stanford Linear Accelerator Center. In spring 1977, he became a Full

Professor at the University of Utrecht, and in 2003 he was designated a Royal Dutch Academy of Sciences (KNAW) Professor. In spring 1981, he was appointed a Sherman Fairchild Distinguished Scholar at the California Institute of Technology. In 1988, he was Guest Professor at Boston University, and the following year was a Guest Professor at Duke University. He has also held the Simon Stevin Teaching Chair in Antwerp Belgium, and in 2005 was a Visiting Fellow at the Stellenbosch Institute for Advanced Study in South Africa. In addition to the Nobel Prize, Professor 't Hooft has been the recipient of numerous awards, memberships and prizes. These include: 1984 National Academy of Sciences (USA), Foreign Associate; 1986 American Academy of Arts and Sciences, Foreign Honorary Member; 1995 Académie des Sciences, Paris, Associé étranger; 2000 Institute of Physics (London), Fellow and Chartered Physicist; 1979 Dannie Heineman Prize, New York, USA; 1982 Wolf Prize of the State of Israel; 1983 Pius XI Medal, Vatican; 1986 Lorentz Medal, KNAW, Amsterdam; 1995 Franklin Medal, Philadelphia, USA.

Professor 't Hooft has served on many editorial and advisory scientific and governmental boards, and he is the author of more than 200 scientific articles and authored four books: *In Search of the Ultimate Building Blocks*; *Introduction to General Relativity*; *Under the Spell of the Gauge Principle*; *Playing With Planets*.

An asteroid named after him is Asteroid 9491 Thooft, with an orbit between those of Mars and Jupiter. It was discovered March 25, 1971, by C.J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels. They are also the discoverers, in 1977, of asteroid 11779 Zernike, which is named after Frits Zernike, Professor 't Hooft's great uncle.

### Margo Staruch awarded Mickey Leland Fellowship

**Margo Staruch**, a graduate student who joined the department in 2006, received the Mickey Leland Energy Fellowship (MLEF) for summer 2010. She worked at the National Energy Technology Laboratory (NETL) ([www.netl.doe.gov/](http://www.netl.doe.gov/)) in Morgantown, WV for 10 weeks. The MLEF is an Internship program sponsored by the U.S. Department of Energy's Office of Fossil Energy to provide opportunities to women and under-represented minority students who are pursuing academic majors related to the Fossil Energy mission. Margo works under the supervision of Professor **Menka Jain**. The research work on electrochemical properties of metal-oxide materials for fuel cell cathodes in NETL with Dr. A. Manivannan resulted in a paper in the journal "Electrochimica Acta". Congratulations for all the successes!



### Michael Drewson to present 5<sup>th</sup> Annual Edward Pollack Distinguished Lecture

Prof. Michael Drewsen of the University of Aarhus, Denmark has accepted our invitation to give the Edward Pollack Memorial Lecture in AMO Physics on November 7, 2011. Prof. Drewsen runs a research group of 15 students and postdocs in the Department of Physics and Astronomy at the university. Their activities span various topics involving cold, trapped ions. The topic of his lecture will be "Experiments with Cold Trapped Molecular Ions."

Trapped molecular ions can be cooled into the milliKelvin regime through the Coulomb interaction with simultaneously trapped and laser-cooled atomic ions [Mølhave, Phys. Rev. A, (2000)]. The molecular ions are not only cold, but also strongly localized and can be stored for hours. Experiments can be conducted with large samples of thousands of ions or with smaller samples, even single ions. In recent years, novel research activities have developed

across the world, including studies of (cold) chemistry, high-precision spectroscopy and quantum optics. In 2010, Prof. Drewsen's group published a paper in *Nature Physics* (v.6, p.271) describing the cooling of molecular ions for the first time to their lowest vibrational and rotational level using laser-based schemes.

The Pollack Memorial lecture honors the memory of the late Edward Pollack, a distinguished professor in our department since the late 1960s, who was noted for his research in atomic collisions and his highly effective physics teaching at all levels. Previous Pollack lecturers include Dr. Ara Chutjian (JPL/Caltech and a collaborator of Prof. Pollack), Prof. Claude Cohen-Tannoudji (Nobel Laureate - ENS, Paris) and Prof. Tom Cravens (University of Kansas).

### ***Joe Pechkis Awarded NRC Fellowship***

In the spring of 2010, **Joseph A. Pechkis** (Ph.D. '10) was awarded a National Research Council (NRC) Postdoctoral Fellowship. The NRC was formed in 1916 to expand upon the existing National Academy of Sciences, which was founded by a congressional charter signed by President Lincoln in 1863, due to an increasing role of science in national priorities and public life. Joseph's Ph.D. advisor, Phillip L. Gould was also a recipient of an NRC award in 1986 in the Laser Cooling and Trapping group of 1997 Nobel Laureate William D. Phillips at NIST, where Joseph's wife, Hyewon K. Pechkis (Ph.D. '10), is performing her postdoctoral research. Joseph's research on ultracold atom transport and electromagnetically induced transparency (EIT) in a blue-detuned hollow waveguide mode is being carried out at the Naval Research Laboratory under the supervision of Fredrik K. Fatemi in Washington, DC.

### **Doug Pease Named Outstanding ECE Coordinator**

On May 5<sup>th</sup>, **Douglas Pease** received the award for Outstanding Early College Experience High School Coordinator for the state. Early College Experience (ECE) is a concurrent enrollment program that allows actual college or university credit to be received for courses, as opposed to the Advanced Placement Program (AP) in which a high school course is given which can be used as equivalent credit. ECE has blossomed since Gillian Thorne has become chief administrator, and ECE is now in Connecticut a serious competitor to AP, at least for physics. Congratulations for this well-deserved honor, Doug!

### **The Norman Hascoe Lectures on the Frontiers of Science**

The Department of Physics has completed our thirteenth year of the lecture series funded by the late Mr. Norman Hascoe of Greenwich, Connecticut. The lectures are open to the public but the focus is to excite undergraduates into pursuing their individual scientific interests. Lectures include a reception and an informal panel discussion. This year's lectures included:

- Dr. Ron Dror, D. E. Shaw Research, New York, NY, "Long-Timescale Molecular Dynamics Simulation as a Tool for Understanding Drug Targets"
- Professor Udo Schwartz, Yale University, "Atom-Specific Interaction Quantification by High-Resolution Atomic Force Microscopy - and What We Can Learn From It"
- Michal Lipson, Cornell University, "Manipulating Light On Chip"
- K. Birgitta Whaley, University of California-Berkeley, "Quantum Coherence in Biology"

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. Advances in nanoscale science are being made in many disciplines. We are pleased to be able to offer a variety of topics to our students and hope to include an even wider variety this coming academic year.

## Senior Project by Mallory Guy among Finalists in IEEE Competition

**Mallory Guy** was invited to IEEE's 2011 International Future Energy Challenge (<http://www.energychallenge.org/>) with her team's senior project for her Engineering Design Course, one of only two entries to be accepted from the USA. Mallory's project was one of seven finalists in the IEEE Energy Competition, Topic A, at the University of Michigan, Dearborn Campus,

on July 22-23, 2011. The 50-page design description was submitted for Topic (A): Low Cost Lithium-Ion Battery Charger for Automotive and Renewable Energy. Applications. There were about 30 proposals from 20 countries. Mallory received a B.S. in Physics and also a B.S. in Electrical Engineering at the respective Commencement Ceremonies in early May, 2011.

## Sarah Bouckoms



After graduating as a physics major from UConn in 2007, **Sarah Bouckoms** did a Postgraduate Certificate in Antarctic Studies at the University of Christchurch in Canterbury, New Zealand, and then started her Master in Physics program there. She did her thesis working with IceCube, the Neutrino detector at the South Pole, and presented her results in April at the Madison Wisconsin IceCube Completion Conference. She was in Canterbury when the devastating earthquake struck on February 22, and rescued her grandmother from her damaged house; she then spent days shoveling silt for the student volunteer army. Sarah is currently waiting to hear back on several job applications for positions as a scientist in Antarctica. There is a nice photo of her in her Antarctic gear at [http://www.anzec.org/view\\_member.php?member\\_id=81](http://www.anzec.org/view_member.php?member_id=81) where she's listed as a student member of ANZEC, the Australia New Zealand Explorers Club.

## Charles Reynolds Distinguished Lecture, October 21, 2011

The Department will host Professor Douglas Scalapino from the University of California Santa Barbara on Friday, October 21, 2011 when he will deliver the Charles Reynolds Distinguished Lecture in Physics at 4:00 pm. Charles Reynolds was a Professor of Physics in our department from 1952 - 1971. Professor Reynolds was one of the co-discoverers of the isotope effect in superconductors, where he showed the dependence of the superconducting transition temperature  $T_c$  upon isotopic mass in isotopically separated samples of mercury. This was important direct evidence for the role of electron-phonon coupling in the mechanism for superconductivity. It became the basic building block of the Bardeen-Cooper-Schrieffer theory which successfully accounts for traditional, low temperature superconductivity.

Professor Scalapino is one of the world's leading condensed matter physics theorists, particularly on subjects such as superconductivity and quantum many body problems. Among the prestigious awards Professor Scalapino earned are the John Bardeen Prize for contributions to the theory of superconductivity and the Julius Lillienfeld Prize of the American Physical Society for exceptional skills in lecturing to a diverse audience. He is a member of the National Academy of Science and a Fellow of the American Physical Society and the American Association for the Advancement of Science. He will speak to us about common threads among different classes of exotic superconductors, most notably the low temperature heavy-fermion, the high-temperature copper-oxide, and the very recently discovered iron-based high-temperature superconductors.



## Sigma Pi Sigma Events and Undergraduate Awards

This year's Sigma Pi Sigma Fiesta on the last day of classes of the spring semester was again outstanding. The new inductees, **William Donahue, Alex Fitts, Benjamin Iannitelli, Kyle Ivey, Nicolas Judd, Nicholas Majtenyi, and Daniel Russano**, have set the bar for admission to SPS very high. They are all outstanding students, and we are glad to have them join our chapter.

The celebration began in earnest at the SPS colloquium given by Professor Mara Prentiss (Department of Physics, Harvard University) on "Solving the Mysteries of Life with Single Molecule Biophysics" (<http://www.phys.uconn.edu/seminars/archive/2011-04-29-16-00-uconn-physics-colloquium/>). The talk, proving once and for all that physicists can do biology well, was extremely well delivered and received. The topic of the talk centered on the physics of DNA repair and reproduction, but see the abstract from the above hyper-link, or ask someone who was there!

The banquet was held at a new location, the Morosko Student Lounge on the 1st floor of the Pharmacy-Biology Building, which turned out to be an improved venue over previous years. Although

the location was new, our good and capable emeritus colleague, **David Markowitz**, emceed the ceremony, as usual. The event was hosted by the Physics Club and six seniors who had previously been inducted into Sigma Pi Sigma: **Derek Horkel, Charles Talbot, Mallory Guy, Marissa MacDonald, Sean Meehan, and Christopher Pelletier**. **Daniel Russano** also won the Katzenstein Prize for the best physics paper by a graduating senior. Dan's paper was titled "Interaction between Brush Layers of Bottle-Brush Polyelectrolytes – Molecular Dynamics Simulations," and he also presented this work at the 2011 March Meeting of the American Physical Society in Dallas. He did this work under the supervision of Professor **Andrey Dobrynin**. **Charles Talbot** was also elected to membership in Phi Beta Kappa, the national honor society for the liberal arts and sciences. Graduating senior **Derek Horkel** was elected to Phi Beta Kappa in 2010 as a junior.

In 2011 we had a small but talented graduating class. We look forward to hearing about their success as they move on to careers in science, technology, and the world at large.

### TIMELESS ARTS AND SCIENCES

The UConn Contemporary Arts Galleries, located in the Art Building of the School of Fine Arts, will start the fall season with a special exhibit TEMPUS NULLIUS. It commences with a colloquium dialogue featuring Swedish multimedia artist Lina Persson, independent curator Manuela Moscoso, physicist/astronomer Dr. **Cynthia Peterson**, and theoretical physicist Dr. **Ronald L. Mallett**, author of *Time Traveler: A Scientist's Personal Mission to Make Time Travel a Reality*. This will be held on September 12 at 6 PM in the Konover Auditorium of the Dodd Research Center. TEMPUS NULLIUS will show from September 12 to October 21. Colloquium and exhibit are free and open to the public. For additional information contact Prof. Barry Rosenberg at [barry.rosenberg@uconn.edu](mailto:barry.rosenberg@uconn.edu).

### Distinguished Women Physicist Lecture Series

The spring 2011 semester saw the inception of a Distinguished Women Physicists Lecture Series. A total of eight female scientists from prestigious universities and national laboratories gave presentations that were embedded in the usual colloquium and Hascoe lecture series. These women talked about physics topics such as Bose-Einstein condensates or nucleon spins as well as interdisciplinary efforts with engineering (e.g., computer chip development), biology (e.g., chromosome pairing), and biochemistry (e.g., photosynthesis). They drew much interest from inside and outside the department, and served as wonderful role models for young scientists, both female and male. In particular, those visits included catered undergraduate lunches. The students describe this experience as very enjoyable and useful, and often it was their first real personal encounter with "real" researchers, especially outside the department.

# DemosRUs

UConn alumnus (BA 1974) and retired lab coordinator from the Physics department, **Robert V. Erickson**, along with retired Physics teacher **George Vartenegian** launched a Limited Liability company called Demos “R Us” in 2000. Both also currently hold gratis positions with the Department, which tremendously appreciates their outreach efforts. “Our desire is to provide science demonstrations, knowing that what the students see can appear as magical, but it is real science. One of our goals is to show that science can be interesting and fun.”

They have incorporated the motto of

Tell me – I forget

Show me – I remember

Involve me – I understand.

During the demonstrations, students are involved as much as possible so that the

concepts of the subject matter are better understood. The teacher is involved in the selection process to ensure a connection between the demonstrations and the classroom curriculum.

A series of demonstrations in Electricity and Magnetism, Pressure, Forces, Low Temperature Physics, and Optics and Sound has been developed and the two principals are always working to develop new ones.

George and Bob have had the wide experience of making demonstration presentations to pre-kindergarten classes, as well as first grade through high school. One of the schools that has held science demonstrations is Woodstock Middle School in Woodstock Connecticut. Arline Maynard, a sixth grade science teacher at Woodstock Middle school, in an interview with the Norwich Bulletin was quoted as “the science demonstrations for students have a lasting effect. For the rest of the year, the students will make connections with what we have studied in science and the demonstrations that happen when the gentlemen come. It makes them very excited, looking at the wonder of science and it piques their interest.” Jill Levasseur, science department representative at Bacon Academy in Colchester stated, “They’re very knowledgeable men and have been adding things year after year. They keep finding new tricks to bring us.”

Bob and George find joy watching the faces of the students and sometimes teachers as they are thinking about the material presented. “When we see the eyes light up, hear the words ‘no way – that can’t happen,’ we know that we have found a way to bring some understanding of the science involved in the demonstration.” “This venture has been rewarding as well as enjoyable.”



## Arrivals/Departures

The particle theory group is very pleased to announce the hiring of a new faculty member at the assistant professor level, Dr. **Fedor Bezrukov**. Fedor is currently a senior postdoc in the group of the Chair for Theoretical Particle Physics of the Ludwig-Maximilians-Universität, München, Germany (his home page is <http://homepages.physik.uni-muenchen.de/~Fedor.Bezrukov/>). He received his Ph.D. from the prestigious Moscow State University under the guidance of Professor Valery Rubikov. Fedor is active in many areas, including beyond-the-standard-model physics, dark energy, and neutrino physics. His appointment is joint with the RIKEN BNL Research Center at Brookhaven National Lab. His wife Oleysa, who is a biochemist at the Université de Genève, will join him, and they plan to arrive in January 2012. Please welcome them!



Dr. **Jan-Michael Carrillo** joined the Physics Department in January 2010 as a post-doctoral fellow in Professor **Andrey Dobrynin's** research group. He is using a combination of theoretical



and computational techniques to understand the role of the electrostatic interactions on lubrication in polymeric and biological systems. Jan-Michael earned his B.S. and M.S. degrees at the University of

the Philippines, Diliman Quezon City, in Chemical Engineering and Environmental Engineering. His background and Ph.D. thesis work with Professor Dobrynin on "Computational Studies of Polymeric Systems" will enable the research project to make great advances.



**Amer Kotb** is a research scientist who joined Professor **Niloy Dutta's** group in 2009. He has been awarded a full fellowship sponsored by the

Egyptian government for two years to conduct research studies in support of his Ph.D. degree from Fayoum University. Amer's research has been in the area of all-optical logic devices. He has demonstrated all-optical XOR, OR, AND and INVERT operations at speed of 80 Gb/s which is the highest data rate of performance reported so far. Also, he has demonstrated a new scheme for logic operation using Two-Photon Absorption which is scalable to very high speeds.



Amer received his B.Sc. and M.Sc. in Physics from the University of Cairo and from the University of Fayoum, Egypt, in 2002 and 2006 respectively. He was born in Beni-Seuf, Egypt. He is married and has two children. Amer will return to Egypt at the end of September 2011.



Professor **Douglas Hamilton** has been named the Interim Head of the Physics Department and we welcome him to his new role. He took over the position on July 1, 2011 when Bill Stwalley stepped down as Department Head. Hamilton received a B.A. in Physics from the University of Colorado in 1971 and a Ph.D. in Physics from the University of Wisconsin-Madison in 1976. From there he held a joint appointment as a Research Associate in Physics and Electrical Engineering at the University of Southern California.

Professor Hamilton joined the Physics Department at UConn in 1979. During his 32 years at UConn, he is most proud of the ongoing professional accomplishments of the eight Ph.D. students for whom he served as their Major Advisor.

The emphasis of his research program has been the investigation of the optical properties of solid-state materials, especially those incorporating substitutional lanthanide (rare-earth) and transition metal ions. The research is conducted primarily using laser-based spectroscopic techniques involving both linear and nonlinear interactions. Most recently he has been investigating scintillator materials with an emphasis on understanding efficiency limitations of

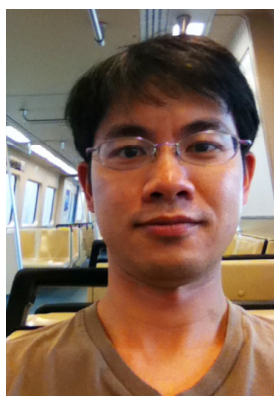


the conversion to visible light.

Doug served a five year appointment as the Associate Dean for the Physical and Mathematical Sciences in the College of Liberal Arts and Sciences from 2006 through 2011. In 2009-10 he was the Interim Vice Provost for Undergraduate Education. He is a Fellow of UConn's Institute for Teaching and Learning and a member of the Connecticut Academy of Arts and Sciences.



We are happy to welcome Dr. **Guin-Dar Lin** to the Department of Physics. Guin-Dar joined the group of Professor **Susanne Yelin** as a Postdoctoral Fellow in September 2010,



coming from the group of Prof. Luming Duan at the University of Michigan. An expert in the theory of ions and ion crystals in traps, he collaborates with Prof. Chris Monroe's (University of Maryland) ion trap quantum computing experiments. Guin-Dar

is now working on superradiance, i.e. the collective enhancement of spontaneous radiation that can be dramatic in some environments. In particular, he includes the findings from these studies into the research of Professor Yelin's group on polar molecules. One example is to use these effects on the transitions between vibrational states of polar molecules, which are otherwise difficult to address directly.



**Heather Osborne** was hired in November 2010 as the Manager of Laboratory Services for the physics department. Heather is in charge of all aspects of our introductory laboratory courses, including supervising our teaching assistants. One of Heather's most interesting qualifications is that she actually took our introductory lab courses, since she was a UConn physics undergraduate student. She graduated with a BS in Physics in 2000, with a minor in mathematics. After UConn, Heather received a Masters degree in Astronomy from New Mexico State university. She has extensive experience as an adjunct physics faculty member at Western Iowa Tech Community College and Northwestern College of

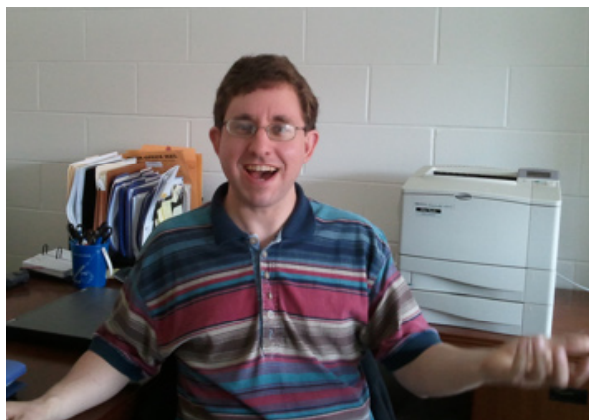
Iowa as well as serving as an editor working on articles to be published in several top physics journals. Since returning to UConn, Heather has jumped into the tasks of designing new TA-



training programs and updating our laboratory curricula. We welcome Heather back to her alma mater and look forward to her energizing our teaching labs.



**David Rahmlow** has just begun his second year as a postdoctoral fellow working on two related programs on ultracold physics. One is the research program on ultracold molecules in the P007 laser laboratory, a joint venture of Professors **Stwalley**,



**Gould**, and **Eyler**. The other is a program on ultracold Rydberg atoms led by Professors Gould and Eyler, located in room P325. David comes to us from Yale University, where he completed his Ph.D. with Professor David DeMille. In addition to his general atomic physics background, he has particularly strong interests in instrumentation and experimental methods.



The Physics Department welcomes the new Program Assistant for both our undergraduate



and graduate programs. **Barbara Styrzcula** lives in Farmington with her husband, three children, and black lab named Riley (a.k.a. the cupcake



thief) and is native to Connecticut, although she grew up speaking Polish. Barbara has a strong interest in things international - she worked for many years for non-profit organizations involved in community and family programs and international economic development. Besides Polish

and English, Barbara has studied Spanish, Russian and French. Both her personal and professional interests in the world have taken her to Siberia, India, Mexico, Puerto Rico, Panama, the Czech Republic, the Dominican Republic, and Morocco. Barbara likes working at UConn in Storrs because of the strong international diversity of the students and faculty. Two of her children attend school here. We are thrilled to have Barbara on board - stop in and say "Hello" if you get the chance!

We would like to express our thanks to **William C. Stwalley** for serving as Head of the Department of Physics for 18 years. Professor Stwalley is Director of the Connecticut Laser Facility, Affiliate Professor of Chemistry, a Board of Trustees Distinguished Professor, and an internationally known expert in ultracold physics. He is a Fellow of the APS and the AAAS, and a 2005 recipient of the Connecticut Medal of Science. He has a long and distinguished record of service to the physics community. He is also a dedicated servant of the university; his more recent appointments include chair of the search committee for the Dean of Engineering in 2007, and member of the buildings and grounds committee and the space committee of the University Senate.

William Stwalley's distinguished research career has featured major advances in both experiment

and theory. Early in his career, he developed a widely-used model for the energy level spacings of highly vibrationally excited levels in molecules, and he published a detailed proposal showing that Bose-Einstein condensation of a dilute gas should be possible, long before this now-familiar topic had even occurred to anyone else.

He has had a career-long interest in the structure and interactions of diatomic molecules composed of alkali atoms such as sodium, potassium, and rubidium, and is regarded by many as the world's foremost expert on these molecules. More recently, he leveraged this background to become one of the early pioneers in the formation and study of ultracold molecules by photoassociation, a process in which laser excitation joins together a pair of ultracold atoms to form an excited-state molecule.

At present, his research is focused primarily on the physics and chemistry of these ultracold molecules. He leads a large and active experimental research group in the P007 laboratory, much of it a joint effort with Professors Gould and Eyler.

The Physics Department and all of his colleagues around campus are grateful for all his hard work for the Department and his many fine contributions to the University.

Dr. **Maurizio Ungaro** has been a key member of the experimental nuclear physics group of Professor **Kyungseon Joo** since 2004, first as a Postdoctoral Fellow, then as a Research Associate. He obtained his undergraduate degree from Università degli studi di Genova, Genoa, Italy and in 2003 completed his Ph. D. at Rensselaer Polytechnic Institute in Troy, NY under the supervision of Prof. Paul Stoler. Mauri is an expert in the study of nucleon excitations and has been working on the CEBAF Large Acceptance Spectrometer detector at the Thomas Jefferson National Accelerator Facility. He has just accepted a Staff Scientist position with TJNAF. Congratulations, Mauri! We are also pleased that we will be able to continue our collaborative work.



We are happy that Dr. **Diego Valente** joined our Department in February 2010, after completing his Ph.D. at the University of Central Florida under the direction of Professor Eduardo R. Mucciolo. His work in theoretical condensed matter physics

specialized in quantum information processing. His thesis title was “Decoherence in Semiconductor Solid-State Quantum Computers,” in which he investigated decoherence in quantum dot charge-based qubits. Diego is a member of the group of Professor **Robin Côté** and works on charge transfer between ultracold atoms and ions of alkaline-earth elements. This work should pave the way to applications of ultracold atom-ion systems to quantum information as well.

## UConn Physics Graduate Student Placement, Fall 2011

Our recent MS and PhD graduates have done extremely well starting their careers after physics graduate school. **Brad Moser** (now at Univ. New England, ME), **James O’Brien** (Wentworth Institute of Technology, MA) and **Kalum Palandage** (Trinity College, CT) have positions as faculty and staff in Academia. The following graduates have taken up postdoctoral research scientist positions: **Tolga Altinoluk** (Ecole Polytechnique, Paris), **Gokce Basar** (SUNY, Stonybrook), **Marko Gacesa** (ITAMP/UConn), **Adolfo Huet** (Univ. Michoacan, Mexico), **Yuefeng Nie** (Cornell Univ.), **Joe Pechkis** (Naval Research Lab, Washington), **Hyewon Pechkis** (Joint Quantum Institute, Univ. Maryland), and **Ran Zhou** (Indiana Univ). Another group of graduates are working in scientific staff research positions in industry or at government research labs: **Zhe Chen** (JDS-Uniphase, CA), **Sam Emery** (Eglin Air Force Base Research Lab, FL), **Kuang He** (Geophysicist at ION Geophysical, TX), **Don Telesca** (Kirkland Airforce Base Research Lab, NM), **Yuan Zhou** (Intel, AZ), and **James Zickefoose** (Canberra Industries, CT).

Congratulations to all our graduates – well done!

### Dave’s Dilemma

Your editor has been asked by bright inquisitive youngsters who read, watch TV, and go to movies various questions. He would like to hear thoughts on how to answer them. One such puzzler is below.

- Is there any correct physics or chemistry in the Harry Potter series?

Possible answers may be tweeted to <http://twitter.com/uconnphysics>. We look forward to hearing from you.

## ENDOWMENT NEWS

The department is very pleased with your endowment contributions, which continue to enhance our mission. The endowment of Drs. Henry and Constance Katzenstein will once again bring a Nobel Laureate to campus for the twelfth annual "Katzenstein Distinguished Lecture." This fund also provides a monetary prize for the best undergraduate physics paper of the year (see related article on page 5). The Edward Pollack Endowment for Physics, initiated by Ed's family, supports an annual distinguished lecture in Atomic, Molecular, and Optical Physics (see related article on page 2).

We are happy to announce a new endowment in Physics which supports the missions of the department and university by providing fellowship support for graduate students enrolled full-time in the Department of Physics in the College of Liberal Arts & Sciences. The "Kurt Haller Academic Opportunity Fellowship" fund was initiated by Thomas J. Welsh (his former student, B.S. 1975) and acknowledged by Lottie S. Haller (wife of Kurt) in memory of Kurt Haller (Professor in Physics 1964-2004, serving as Department Head on three separate occasions). Candidates for the award must demonstrate academic achievement and financial need.

We have several maturing funds intended to support graduate students doing research. The Georgiana and Marshall Walker Endowment rewards the student voted by the faculty as the best Teaching Assistant of the year. For 2010, the award was presented to Charles Rogers. The Anne and Win Smith Fellowship (Win Smith is currently Emeritus Professor of Physics) is awarded to students demonstrating academic achievements. The Isaac S. and Lois W. Blonder Graduate Fellowship in Physics was named for Isaac Blonder - our first physics major,

Charles Talbot, advisee of Professor Susanne Yelin, was initiated to Phi Beta Kappa for 2010-11. He is majoring in Physics and Mathematics. Congratulations, Charlie!

B.S., 1938. Adric Quackenbush, from Franklin & Marshall College [Pennsylvania], has been awarded the Ruth and Paul Klemens Endowment Award, named in honor of our distinguished Emeritus Professor Paul Klemens and his wife Ruth. Paul Klemens is a world expert on phonons and thermal conductivity in condensed matter physics [<http://advance.uconn.edu/2005/051017/05101711.htm>]. The Nagavarapu Graduate Award in Physics (Nagavarapu S. Mohan received his Ph.D. in 1975) was presented to Scott Galica, from Colby College [Maine]. Other endowments include the Dwight Hills Damon Graduate Fellowship in Experimental Physics (initiated in 2006 in his honor and memory); the Edward Frisius Memorial Fellowship (initiated by his family, which includes Mauricette (Frisius) Stwalley, wife of William Stwalley, the Head of the Department of Physics 1993-2011); and the Kurt Haller Endowment for Physics Research and Graduate Education which provides yearly research awards to our best graduate students (initiated in 2004 in his honor and memory) are all continuing. This year, Ekaterina Sergan, from University of California, Davis, has been awarded an Outstanding Student Award from the UConn Physics Department and Graduate School.

We are grateful to all of you who contribute to these funds. Many of you respond to the general solicitations sent out by the University; we would be grateful if you used the fund numbers on the next page to direct such contributions to the Physics Department. We appreciate your assistance supporting and educating our students.

### *Making a Gift*

*There are many ways of making a gift including checks; marketable securities; planned or estate gifts; and through payroll deduction for University employees. Checks should be made payable to The University of Connecticut Foundation, with a cover note directing your gift. All gifts are eligible for tax deductions as The University of Connecticut Foundation, Inc., is recognized as a 501(c)(3) non-profit organization. Donors have the option of remaining anonymous if they wish.*



STAY IN TOUCH

*We've added a feature to our departmental web page that also assists our Alumni Office in updating their records. We would like to start an email distribution list for our Physics Alumni and Alumnae so that we can update you promptly when we have important news to share. Please help us by logging on to our site <http://www.physics.uconn.edu> and clicking onto the link for Alumni. That will take you to a page that requests your contact info, including your email address. There is also a place for any comments you would like to send us. We want to keep in touch and keep you posted. Thank you for your assistance.*

I/we would like to support the Physics Department programs.

Please direct my gift of \$ \_\_\_\_\_ to:

- \* Kurt Haller Academic Opportunity Fellowship (31224-2014)
- \* Anne and Win Smith Fellowship (22662-2014)
- \* Edward Frisius Memorial Fellowship (22520-2014)
- \* Space-Time Twisting by Light Project (22398-2014)
- \* Time Domain Fund (22457-2014)
- \* Dwight Hills Damon Graduate Fellowship in Experimental Physics (31028-2014)
- \* Edward Pollack Endowment for Physics (30958-2014)
- \* Ruth and Paul Klemens Endowment (30951-2014)
- \* Kurt Haller Endowment for Physics Research and Graduate Education (30911-2014)
- \* Marshall and Georgiana Walker Graduate Award Fund (30876 -2014)
- \* Nagavarapu Graduate Award in Physics (30723-2014)
- \* Katzenstein Distinguished Lecture Series Endowment (30438-2014)
- \* Charles Swenberg Memorial Endowment (30641-2014)
- \* Isaac S. and Lois W. Blonder Graduate Fellowship Endowment (30743-2014)
- \* Physics Department Unrestricted Fund (20351-2014)
- \* Physics Olympiad (payable to "UConn" and mailed to Dept of Physics) (20352-2014)

Matching Gift

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

My company is: \_\_\_\_\_

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Should you wish to support one of these efforts, please send your contribution directly to the University of Connecticut Foundation with the fund number of the program of interest to you written on your check.

University of Connecticut Foundation  
2390 Alumni Drive, Unit 3206  
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Thank you for your support!

Any news about yourself that you are interested in sharing? We have enjoyed the unsolicited mail we receive as a result of our newsletters so now we're actively soliciting. Please send suggestions to: David Markowitz, Editor, at the Department address.

SAVE THE DATE

November 4, 2011

Invitations for the Katzenstein dinner are about to be mailed. If you are interested in attending but do not receive your invitation by the end of September, please contact Kim Giard at 860-486-4924, email: [kim.giard@uconn.edu](mailto:kim.giard@uconn.edu).