

Department of Physics News

Professor Leon N. Cooper **Katzenstein Distinguished Lecturer** **Friday October 28, 2016**

Physics is proud to announce Nobel Prize winner Dr. Leon N. Cooper of Brown University will be presenting this year's 2016 Katzenstein Lecture. Professor Cooper shared the 1972 Nobel Prize in Physics, with J. Bardeen and J.R. Schrieffer. The Nobel Prize was awarded for the first microscopic theory of superconductivity, now known as the BCS Theory. Superconductivity as evidenced by the disappearance of the electrical resistivity was first observed in Mercury by Kamerlingh Onnes in 1911. Immediately, many theorists including Albert Einstein, set out to explain this newly observed phenomena. However it was not until 1933 that the essential property of magnetic flux exclusion was observed by Meissner and Ochsenfeld. No successful microscopic theory was developed until the 1957 Physical Review Paper giving us the BCS theory. A crucial element for the theory was published in a short letter to the Physical Review in 1956 by Leon Cooper, titled 'Bound Electron Pairs, in a degenerate FERMI Gas'. These pairs are now commonly referred to as 'Cooper Pairs'.

Professor Leon N. Cooper

Leon Cooper was born in 1930 in New York City where he attended Columbia University (A.B. 1951; A.M. 1953; Ph.D. 1954). He became a member of the Institute for Advanced Study (1954-55) after which he was a research associate at the University of Illinois, Urbana Champagne (1955-57) where the BCS Theory was developed. He later became an assistant professor at the Ohio State University (1957-58). Professor Cooper joined Brown University in 1958 where he became Henry Ledyard Goddard University Professor (1966-74) and where he is presently the Thomas J. Watson, Sr. Professor of Science and Director of Brown University's Center for Neural Science.

In 1968, he was awarded the Comstock Prize (with J.R. Schrieffer) of the National Academy of Sciences. He has also received the Award of Excellence from the Graduate Faculties Alumni of Columbia University (1974), the Descartes Medal from the Académie de Paris, Université René Descartes (1977), the Yrjö Reenpää Award from the Finnish Cultural Foundation (1982), the John Jay Award from Columbia University (1985), the Alexander Hamilton Award from Columbia University (1995), College de France Medal (2000). He also holds seven honorary doctorates. In 2013 Professor Cooper was awarded the Susan Culver Rosenberger Medal, the highest honor the Brown University faculty can give. He is a fellow of the American Physical Society and American Academy of Arts and Sciences as well as a member of the National Academy of Sciences. Professor Cooper's present interests include studies of superconductivity and the foundations of quantum mechanics. Please see page 2 for more details on his upcoming lecture.



Title: “On the Interpretation of the Quantum Theory: Can Free Will and Locality Exist Together in the Quantum Theory?”

Abstract: The quantum theory is the basis for thousands of calculations of atomic and molecular systems. They can be used to determine the chemical and (ultimately) biological properties of these systems. In some situations, such as the magnetic moment of the electron, agreement between theory and experiment is truly astonishing. But the interpretation of the quantum theory is still disputed. In particular, how can we understand such things as wave function reduction?

In this lecture he will present an interpretation of the quantum theory that does not require wave function reduction. He will also be addressing questions, such as, “What is a measurement?”, and “Can free will and locality exist together in the quantum theory?”

We hope to see you at this very interesting lecture!

Serge Haroche, 2015 Katzenstein Lecture

The Katzenstein Distinguished Lectures series continued in fall 2015 for its 18th year, with an October 30th lecture by Prof. Serge Haroche of the College de France and Ecole Normale Supérieure (ENS), Paris titled “Exploring the Quantum to Classical Boundary”. Haroche discussed some of the topics cited in awarding him the 2012 Nobel Prize, which he shared with David Wineland, the 2014 Henry Katzenstein Lecturer. His research in cavity quantum electrodynamics (QED) at the ENS involved the construction of a superconducting microwave cavity (or “photon box”) whose radiation field is prepared by injecting a beam of highly-excited Rydberg atoms that can emit and absorb resonant photons into the cavity. This system permits the actual realization of some of the idealized thought experiments proposed by the founders of quantum mechanics in the 1920s but only carried out in recent years.

The abstract of Haroche’s Nobel Prize Lecture describes the realization of “the non-destructive counting of photons, the recording of *field* quantum jumps, the preparation and reconstruction of ‘Schrodinger Cat’ states of radiation (where a quantum system can be in a superposition of two disparate states at the same time) and the study of their decoherence. This provides a striking illustration of measurements of the transition from the quantum to the classical world.” Different types of cavity field states are demonstrated and measured by detecting the final Rydberg states of beam atoms that have passed through the superconducting cavity, for example quasi-classical coherent states, Fock number states and Schrodinger cat states (analogous to a cat that is in a superposition of two contrasting macroscopic states: dead and alive). *For those that want to know more, please see the paper by Haroche and collaborators: Nature 455, 510 (2008) or Haroche’s Nobel Lecture online.* The lecture included general advocacy for the serendipity involved in basic or “blue-sky” research, e.g. research that led to the laser in the 1960’s which has had numerous hard-to-predict long-term practical and research applications. Examples include use of lasers as a tool for making a trapped-ion computer based on qubits, with applications in cryptography, as well as improvements in the precision of atomic clocks by 10 orders of magnitude over the last 50 years, with applications e.g. to GPS navigation. Haroche is known for his profound and clear lectures; those that paid close attention were well rewarded.

The lecture took place in physics Lecture Room P-36, and an excellent attendance included the physics undergraduates, graduate students, faculty from Physics and other departments, and a number of UConn

Physics alumni'. Dr. Haroche was able to meet informally with graduate students before the lecture. Following the lecture, Henry Katzenstein's son David, a Professor at Stanford Medical School, joined Serge and Claudine Haroche, faculty, staff, alumni and guests for a gala dinner at the UConn Foundation Building.

The Katzenstein Lectures are made possible by an endowment established by the late Dr. Henry S. Katzenstein and his wife Dr. Constance A. Katzenstein. Cornell Professor David Lee (1996 Nobel Laureate in Physics and 1956 M.S. alumnus of UConn) gave the first lecture of the current series of annual lectures by Nobel Laureates, in 1997. Henry Katzenstein received the first Ph.D. in physics from our Department in 1954 after only three years as a graduate student here.

Thomas F. Gallagher, Davison-Germer Prize winner presents the 2016 Pollack Distinguished Lecture

The annual Edward Pollack Memorial Distinguished Lecture was presented as a Physics Department Colloquium on Friday, April 15, 2016 by Thomas F. Gallagher of the Physics Department at the University of Virginia. The Pollack lectures are funded by an endowment established by the family and friends of the late Prof. Edward Pollack. They bring to the Department a distinguished speaker to talk on a topic related to experimental atomic, molecular and optical (AMO) physics, which was Prof. Pollack's main research interest, or to undergraduate physics teaching to which he has devoted more than 40 successful years. Pollack began as a UConn faculty member in the early 1960's, after earning his Ph.D. at NYU under Prof. Benjamin Bederson. Prior to that, Ed had served in the U.S. Army and had taught physics at both NYU and the City College of NY (CCNY, his alma mater). For years, Ed was a mainstay of our Department, having taught most the undergraduate courses while maintaining an active and successful research program in experimental atomic and molecular collisions, with DOD and NSF support. He was a Fellow of the American Physical Society.



Thomas F. Gallagher

Prof. Gallagher, the Jesse W. Beams Prof. of Physics at Virginia, received his Ph.D. in atomic and molecular beams at Harvard in the group of Nobel Laureate Norman Ramsey. He conducted full-time research at SRI, International (Stanford Research Institute) in Menlo Park, CA before assuming his present post at the University of Virginia, where he served for several years as head of the Physics Department. He is a Fellow of the American Physical Society and author of a book *Rydberg Atoms* published by the Cambridge University Press. In 1996 he received the Davison-Germer Prize of the American Physical Society for his research on collisional behavior of highly-excited states of atoms, and in 2010-2011 he received a Distinguished Scientist Faculty Award from the University of Virginia.

The April 15 Pollack Lecture discussed Gallagher's recent research on ionization and recombination of highly-excited Rydberg atoms "dressed by" strong microwave fields. Ed Pollack's widow, Rita, and daughter, Cindy, were in attendance representing the family. Prior to the lecture, graduate students gathered to speak informally with the Pollack lecturer. Then, a one-hour reception preceded the lecture and included the annual Departmental employee appreciation ceremony. Gallagher's lecture compared his Rydberg (one highly-excited electron) H-like-alkali-atom experiments in strong microwave fields with similar surprising effects seen with

GV/cm field multi-photon laser ionization experiments with atoms like helium, where both strong ionization and recombination are found to occur. In the Rydberg case, even though the atoms are easily ionized 100% by static DC electric fields of magnitude orders of magnitude less than the microwave amplitudes Gallagher uses, a microwave pulse strong enough to ionize 90% of atoms in a given initial Rydberg state is found to leave behind 10% of the atoms in high-lying bound states in a resonant process. Gallagher gave a clear and intuitive explanation of these surprising phenomena without resorting to complex mathematical arguments.

The Pollack lecture series continues to be an inspiration to our faculty and students, particularly in the AMO field. Previous Edward Pollack Distinguished Lecturers were - **2015**: Deborah Jin, University of Colorado, JILA; **2014**: David Pritchard, MIT; **2011**: Michael Drewsen, University of Aarhus, Denmark; **2010**: Thomas Cravens, University of Kansas; **2008**: Claude Cohen-Tannoudji, College de France, Laboratoire Kastler-Brossel, Ecole Normale Supérieure; **2007**: Ara Chutjian, Jet Propulsion Laboratory, California Institute of Technology; and **2006**: Lew Cocke, Kansas State University.

2016 Charles Reynolds Lecture

Our Charles Reynolds lecturer in 2015, Prof. Zachary Fisk from UC Irvine, is recognized worldwide as a pioneer in the growth of complex materials such as rare-earth and actinide compounds. Prof. Fisk earned his PhD from UC San Diego in 1969 under the supervision of Prof. Bernd T. Matthias, who was a leading discoverer of cooperative phenomena in solids, and went to Imperial College London to work with Prof. Bryan Coles as a postdoctoral researcher. He returned to UC San Diego where he worked for many years before becoming staff member at Los Alamos National Laboratory in 1981. He moved to Florida State University in Tallahassee in 1994 where he remained until 2003. He spent the following 3 years at UC Davis and joined the Department of Physics and Astronomy at UC Irvine in 2006. He was elected to the National Academy of Science in 1996.

Prof. Fisk has pioneered the single crystal growth out of molten flux of a large number of rare-earth and actinide intermetallic compounds that have been intensively studied worldwide since their discovery in an effort to understand the complex behavior of strongly interacting electrons at very low temperatures. He was among the first who discovered the first uranium based superconductor, UBe₁₃, soon followed by UPt₃. His group was dedicated in pursuing an exciting and ambitious agenda aiming at the discovery and characterization of new materials, which exhibit magnetism, superconductivity and other novel electronic phases. His goal was to find model systems in which simple questions pertaining to the fundamental aspects of the quantum mechanics of a macroscopic number of interacting particles (the so-called “quantum many-body problem”) can be addressed experimentally. He has had a large number of collaborators in US institutions and abroad, whose research ultimately depended on the high quality single crystals his group provided.

Physics Awards

Tom Blum has been elected fellow of American Physical Society (DPP).

Citation: For pioneering methods of lattice QCD to improve the computation of kaon properties, hadronic contributions to the anomalous magnetic moment of the muon and the spectrum of hadrons.

Robin Côté has been awarded the Willis E. Lamb Award for Laser Science and Quantum Optics.

Citation: For pioneering work in the field of ultracold atoms and molecular gases.

George Gibson received the CLAS teaching Excellence Award.

Vasili Kharchenko has been elected fellow of American Physical Society (DAMOP).

Citation: For contributions to the theory of non-equilibrium processes in classical and quantum gases, including energy and charge relaxations in collisions of atoms and molecules and charge-exchange X-ray emissions in astrophysical environments.

Featured Faculty Facts About...

George Rawitscher

- Authored a book on computational methods. It has approximately 200 pages and will be published by Springer Verlag before the end of 2016. G.Rawitscher, V.Filho, T.Pexioto (2016). "A Practical Guide to Spectral Computational Methods", Springer, ISBN:978-3-319-42702-7.
- Presented two invited lectures at the International Conference on Physics 2016, held in New Orleans June 27 through 29, 2016. The lectures were:
 - a) "Revival of the phase-amplitude description of a quantum-mechanical wave function"
 - b) "Spectral Computational Methods"
- Presented a contributed paper of the same title as **a)** at the 23rd European Conference on Few Body Problems in Physics, which took place August 8 through 12, 2016 in Aarhus, Denmark
- Is chair of an Ad Hoc Climate Change committee, established in March 2015. It responds to the Sustainability Committee of the town of Mansfield, Storrs. Its purpose is to reinforce the urgency with which the town should protect itself against future ravages of climate change, such as floods, fires, droughts, zoning, etc.
- Continues to publish research papers. The latest appeared in the journal *Comp. Phys. Comm.* 203 (2016) 138;

Chandra Roychoudhuri

Prof. Chandra Roychoudhuri has recently been highlighted in The Optical Society America ([OSA](#)) April issue of the *OSA Member News* to promote OSA's Traveling Lecturer Program and to encourage more volunteers to [sign up](#). The program significantly subsidizes the national and international travel costs for the traveling lecturers invited by any of the national or international OSA Student Chapters. For over a decade, Chandra has been receiving invitations from OSA Student Chapters around the world. Chandra's direct involvement in the formation of OSA Student Chapters dates back to his tenure as one of the members for the Board of Directors of the Optical Society during 1997 and 1998. At that time, the Board approved of the initiative in forming Student Chapters worldwide. The goal was to nurture future OSA leaders from all over the world. The concept was developed by the OSA Membership and Education Services Council over a period of several years, and was then presented to the Board by Chandra while he was the Chair of the MES Council.

Chandra came to UConn from industry in January of 1992. From 2001 to 2003, he was elected as one of the 'Directors-at-Large' of SPIE to serve for three calendar years. During that time, he was also actively involved in promoting and participating in the International Commission of Optics (ICO), Education & Training in Optics &

Photonics ([ETOP](#)). After the close of his Director-at-Large position for SPIE, he was elected again, by SPIE to be a USA Representative to the ICO from 2003 to 2005 for three calendar years. After the publication of the book, 'The Nature of Light: What is a Photon?' in 2008, as its lead editor, Chandra has been receiving numerous invitations from various OSA Student Chapter leaders, such as: Latvia U; Sao Paulo U; India (NIT, VIT, IIT-Chennai); Warsaw U; UNCC, USA; INAOE, Mexico; Spain, ICFO & IONS.

It is important to emphasize that Chandra has been receiving invitations even though his research activities stem from 'out-of-the-box' thinking. All of his talks are presented in a 'workshop' style and highlight appreciation for all major optical phenomena in a new way, especially as it relates to Non-Interaction of Waves (NIW). NIW, not recognized by modern books and literature, is really an old concept. It is built into the Huygens-Fresnel diffraction integral, which is the foundation behind the entire field of physical optics. This concept was explicitly postulated for the secondary wavelets by Huygens in 1678. Chandra's lectures have been summarized in his recent book, 'Casual Physics: Photon Model

By Non-interaction of Waves', CRC, 2014.

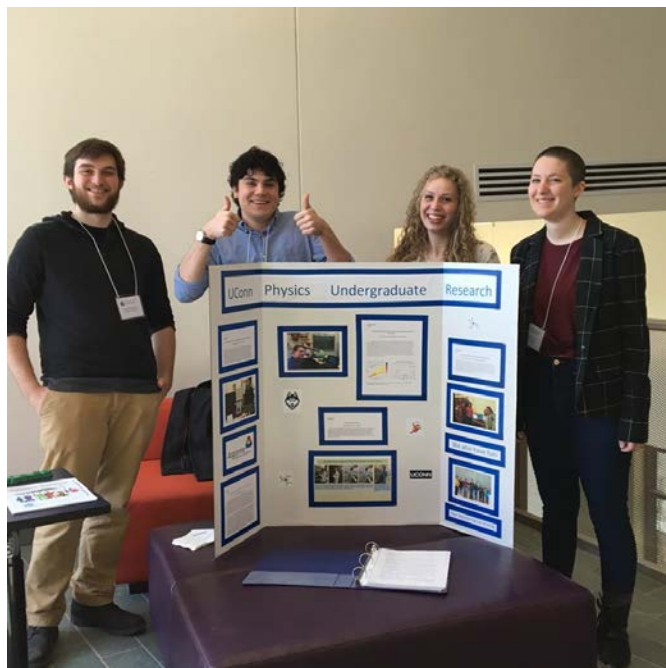


Prof. Chandra Roychoudhuri, with two graduate students of UNCC chapter. They are holding copies of his book donated by the publisher, CRC.

Throughout it all, Chandra has been enjoying his experience as a traveling lecturer. Chandra is especially thankful to all the attending students at the institutions he visited for raising wide variety of questions related to the concept of NIW. These questions have facilitated his own deeper understanding of the physical significance behind the NIW property he has been lecturing upon. Chandra has also been impressed by the consistent pattern of excellence demonstrated by the student leadership in their organizational management capability from every single institution he has visited. As a result, Chandra has recently reported to OSA that its greater vision of nurturing potential future leaders through the formation of international student chapters, has been bearing sustained fruits.

Physics Department Singled Out for Praise at Undergraduate Open House

Each spring UConn holds an Open House for Admitted Students to which prospective undergraduates are invited to visit our campus and speak with representatives from the various schools and majors. This year's event, held on Saturday, April 9th, saw the Physics Department well represented by four enthusiastic and knowledgeable undergraduate physics majors: Amelia Henkel, Jack Lichtman, Connor Occhialini, and Hope Whitelock, as well as Associate Department Heads Tom Blum and Robin Côté, and staff academic advisor Micki Bellamy.



*Connor Occhialini, Jack Lichtmen, Amelia Henkel
and Hope Whitelock*

Visiting students (and their parents) had the opportunity to learn more about our program, speak with real live students majoring in physics, and discuss the possibilities of a career in physics with Tom and Robin. Several of these prospective students followed us up on our invitation to visit the department during the week when classes were in session, to shadow students, tour labs, and meet additional faculty members. The physics department's exhibit included a poster board presentation highlighting some of our undergraduate physics majors and their research projects, however it was our florescent orange bust of Albert Einstein, produced on the 3-D printer in Jason Hancock's lab, which garnered the most excitement. All in all it was a very successful Open House, and the Physics Department's significant faculty and student representation, as well as the vibrancy of our presentation was singled out for praise by Dean Jeremy Teitelbaum.

Sigma Pi Sigma Honor Society

This spring the UConn chapter of the Sigma Pi Sigma Honor Society inducted 11 new members: Filip Bergabo, Vincent Flynn, Kevin Grassie, Daniel Kovner, Jack Lichtman, Paul Molinaro, Connor Occhialini, Brian Roy, Andrew Sampino, Theodore Sauyet, and Hope Whitelock. The academic scholarship of this group is truly outstanding, and probably unprecedented in the chapter's history. Congratulations to all! In addition Bergabo and Whitelock are both doing REU's this summer, Occhialini and Flynn are double Physics and Math majors, and both Roy and Sauyet were the 2015 recipients of the department's Mark Miller award for undergraduate research while Vincent Flynn is the 2016 recipient of the department's Mark Miller award for undergraduate research. The induction ceremony and banquet again took place in the Morosko Student Lounge of the Pharmacy Building. Barry Wells, the new SPS club advisor, masterfully mastered the ceremonies. Micki Bellamy (newly appointed Undergrad Physics Major Advisor!) worked tirelessly behind the scenes to make the days'

festivities a great success. The banquet was preceded by the SPS colloquium, “The Observational Signatures of Planet Formation” by Dr. Sean Andrews, from the Harvard Smithsonian Center for Astrophysics (there seems



to be a pattern developing for the interests of our students). See the article on the new astronomy Group, pg. 18. Dr. Andrews gave a fascinating talk on how planets form from stellar disks, through the growth and migration of pebble-sized particles during the first few million years of the disk’s lifetime. Before the colloquium, graduating senior and Sigma Pi member Michael Cantara was awarded the Katzenstein Prize for best Undergrad research paper titled, “The energy-momentum structure and D-term of Q-Clouds” and has since been named a finalist for the APS Apker Prize.

SPS Inductees. Standing, left to right: Hope Whitlock, Daniel Kovner, Kevin Grassie, Brian Roy, Paul Molinaro, Conner Occhialini, and Vincent Flynn. Kneeling: Filip Bergabo, Theodore Sauyet, Jack Lichtman and Andrew Sampino

2015-2016 Graduate Updates & News

Our recent PhD graduates have started to move into exciting new careers. **Charles Rogers III**, accepted a postdoctoral fellow position at Iptek Photonics Corporation, in Carlsbad (CA). **Douglas Goodman** took up an Assistant Professorship at Wentworth Institute Of Technology, in Boston (MA). **Nathan Harrison** was awarded a Laboratory Postdoctoral Fellowship at Jefferson Lab in Newport News (VA). **Wenbo Li** is now a Senior Engineer at Lumentum Corp, CA. **Ryan Carollo** is now a postdoctoral scientist at Amherst College (MA). **Nicholas DeStefano**, is working as a Senior Research Scientist at MITRE Corporation, in Boston (MA). **Shoroog Alraddadi** accepted a teaching position at Umm Al-Qura University (Saudi Arabia). **Brad Snios** has started a postdoctoral research position at the Harvard Smithsonian Center for Astrophysics, in Cambridge (MA). **AmirAli Farokhniaee** will be starting a postdoctoral research position in Biophysics at Case Western Reserve, in Cleveland (OH). **James Wells** is starting as a Visiting Assistant Professor in the Keck Science Department at Claremont Colleges, in Claremont (CA).

In other news our current student **John Mangeri** was awarded a Graduate Student Research Award (SCGSR) from the Department of Energy (DOE) Office of Science, and will be doing research work at Argonne National Laboratory, and Idaho National Laboratory. Also this summer, Physics students, **Dan McNeel** and **Frank Cao** were awarded Student Research Fellowships at Argonne National Laboratory, **Lukasz Kuna** a summer student research fellowship at Idaho National Laboratory, and **Benjamin Commeau** a summer student research fellowship at Los Alamos National Laboratory. Congratulations to all!

Annual Hike to Mt. Monadnock

Mount Monadnock in southern New Hampshire - some Fun Facts.

"Monadnock is often claimed to be the second-most frequently climbed mountain in the world, after Mount Fuji in Japan. Monadnock is climbed by 125,000 hikers yearly, while Mount Fuji sees 200,000-300,000 hikers yearly. However, according to UNESCO, neither mountain comes close in climbing popularity to Tai Shan in China, with more than 2 million visitors a year. "Quite something, even if you include the Chinese statistic, isn't it? "Notable "power hiking" records associated with the mountain include that of Garry Harrington, who hiked to the summit 16 times in a 24-hour period, and Larry Davis, who claimed to have hiked to the summit daily for 2,850 consecutive days (7.8 years)". Whoa that's crazy! Whoever this Larry Davis dude is, there must be something wrong with him. But then again, maybe not. The mountain is really beautiful. With prominence of 2000 feet and vast bare granite summit, it affords views for many tens of miles in all directions: East to Boston and North to White Mountains in Northern New Hampshire. And when the fall colors are upon us there hardly is a more beautiful place. So for the last N years ($N \gg 1$) come fall, Physics faculty, students, families and friends scale the steep 2 miles from the Monadnock state park up to the summit and open their eyes wide to take in the spectacular beauty of the boundless sea of red and yellow that surrounds the mountain. Last year was no exception. We had a great hike, with a relaxing après-hike barbeque at the Gilson pond site. After the gale force wind at the summit, the hot burgers and the cool drinks (mostly nonalcoholic!) provided a classic counterpoint, which surely will make us want to come back for more this year. Hope to see you all there again this October. Keep your eyes and ears open for further details – they will come soon!

Einstein Centennial Celebration

The 2015/2016 academic year marked the centennial anniversary of Einstein's seminal development of the General Theory of Relativity in 1915. As part of the celebration that this occasioned throughout the worldwide physics community, the UConn Physics Department presented a series of special Einstein colloquia given by a very distinguished set of speakers, as organized by Professor Philip Mannheim and Professor Ronald Mallett. The kickoff talk, entitled "A 'Very' Brief History of General Relativity" was presented by Professor Mallett. In a joint presentation with the Women in Physics Series Professor Marla Geha (Director of Yale Telescope Resources) presented "The Darkest Galaxies". This talk was cohosted by Hope Whitelock a current UConn physics major. Professor Sam Werner (National Institute of Standards and Technology (NIST)) presented "The Effect of the Earth's Gravity and Rotation on the Quantum Mechanical Phase of the Neutron". Professor Robert Blum (Deputy Director National Optical Astronomy Observatory (NOAO)) presented "Astrophysics with Large Ground Based Surveys at the National Observatory". Professor Rainer Weiss (MIT and Laser Interferometry Gravitational Observatory (LIGO)) presented "A Brief History of Gravitational Waves: Theoretical Insight to Measurement". Professor Shep Doeleman (Haystack Observatory MIT) presented "The Event Horizon Telescope: Imaging and Time-Resolving a Black Hole". In a joint presentation with the UConn Center for Judaic Studies, Professor David Kaiser (Program in Science, Technology, and Society MIT) presented "Einstein's Legacy: Studying Gravity in War and Peace". The colloquium of Professor Weiss was particularly auspicious, because shortly after his visit the LIGO program that he jointly led announced the epochal first detection of the gravity waves that Einstein's General Theory of Relativity required. A most fitting centennial year discovery.

Physics Outreach Events

Faculty continue to serve in numerous university as well as national and international committees for various societies. Faculty, staff and students have been involved almost every month during the past academic year with various type of outreach activities. During the spring of 2015, several students, staff and faculty along with several high-school teachers organized the “STEM fest.”



Dave Perry with KASET participants



Cynthia Peterson with KASET participants

Dave Perry and undergraduate student Hope Whitelock gave physics presentations at Taft School, Watertown and Conard High School, West Hartford, CT. During summer 2015, Dave Perry, Hope Whitelock and Menka Jain put on the Liquid Nitrogen show at the Mansfield Library Summer Teen Program for 11-19 year old students. Cynthia Peterson, Mike Winder, John Bartolotta, Dave Perry, Tom Dodge, Heather Osborne presented KASET Astronomy and Physics programs at the Physics Department for 8-14 year old students.

Graduate students Fridah Mokaya and Brendan Pratt were part of the UConn Mentor Connect, a 4-week program for high-school students. Jason Hancock and Hope Whitelock were involved with Kids and UConn: Bridging Education Program, while Menka Jain presented mentorship talks on research and career options to 40 female UConn undergraduate students from the STEM field. Menka also served as one of the Faculty Mentor in McNair Scholar program during summer 2015 that prepared talented, highly motivated UConn undergraduate students for doctoral studies in STEM disciplines. The McNair Scholar program is open to low-income, first-generation college students or those from populations underrepresented in STEM graduate fields who are seeking to pursue a PhD degree.

PHYSICS ANNUAL NEWSLETTER

During fall 2015 Richard Jones presented a talk on “The Higgs Boson and the Origin of Mass” to a Learning in Retirement community at Quinebaug Valley Community College. Dave Perry presented Liquid Nitrogen demonstrations at the Philips Academy, Andover, Massachusetts for about 80 students as well as using Demo r-us with Robert Erickson at Bacon Academy, Colchester, CT for about 125 students. George Rawitscher was involved as the committee chair in Mansfield Township for a “Climate Action Task Force”.



Yasaman & Stephanie mentoring KASET kids



KASET participants playing Ball and Cup game

Ann Marie Carroll and Nitrogen Circus



Since September 2015 two faculty members, Tom Blum and Robin Côté have mentored Glastonbury high school students as part of the Advanced Research Mentorship course. Tom Blum mentored Kevin Wijendr, in particle physics/numerical simulation and Robin Côté, Kaaviyan Faezi in Atomic Physics. Nora Berrah presented skills workshops for women in STEMs field in Tunis, Tunisia funded by Elsevier and the US State Department. During the 2016 winter months, Phil Gould represented and promoted the Physics Department at the Conference for Undergraduate Women in Physics at Wesleyan University by hosting the UConn-Physics booth. Dave Perry, Heather Osborne, Menka Jain and Alan Parry (Math Department) contributed to the CT Science Fair for high school students, evaluating about 100 posters in Physics and Life Sciences for the UConn Special Awards category. Furthermore, undergraduate student Hope Whitelock, Ann Marie Carroll, and Dave Perry contributed to the CT Science Fair by presenting science shows for 400 students using Liquid Nitrogen and working with Demo-

r-us while Cynthia Peterson was one of the Final Judges for the 7th grade Physical Science projects. Philip Mannheim gave an interview on gravity waves to WHUS listeners and Ron Mallett presented “A very brief history of general relativity” at Manchester Community College for students and the general public.

Faculty Recognition

Cynthia Peterson's Retirement

We are losing one of our pioneers: Cynthia Wyeth Peterson joined the department in 1968 and retired at the end of the Spring Term, 2016. In addition to her impressive record of teaching and research, her efforts at outreach are unmatched. In so doing she was not only a mentor for students inside the department, but an example for many young and impressionable students at the secondary level. She was unique in that for decades she was the only woman on our physics faculty (we now have 5, with 2 more expected to join next year). As such, she filled an important need and played a unique role in encouraging young women to become scientists. Cynthia is a graduate of Bryn Mawr College and received her Ph.D. in condensed matter physics in 1964 from Cornell University. In 1966, she became a post-doc at Yale and then a UConn faculty member in 1968. She taught the popular elementary astronomy course nearly continuously since the late 1960's, while concurrently taking charge of the UConn Planetarium and Observatory that she incorporated as an essential part of the astronomy course. She was generous with her time and spent innumerable hours working one-on-one with her students. Her dedication to and love for astronomical science is reflected in the names of the two Peterson children: Tycho and Celeste. Celeste has continued the family tradition as a scientist, working as a molecular biologist and faculty member in the Boston area, while Tycho works in finance as a technology securities analyst and manager.



in atomic collisions and optical materials, to thermoluminescent dating of archaeological artifacts and heat-treated minerals, and most recently 3-D structure determination of metalloproteins using NMR. She has long championed undergraduate research projects, some derived from her astronomy interests (including archaeoastronomy), some related to her thermoluminescent pottery dating work and some related to condensed matter physics (e.g. photoemission) or to biophysics. She also participated in a proposal to CLAS a few years ago hoping to introduce a new research area (biophysics) to the Physics Department.

In addition to her longtime work as a mentor for undergraduates, for decades she has excelled in outreach for the Department and the University, giving public astronomy lectures in libraries, school systems and by radio around the state, serving as astronomy consultant for several newspapers and radio stations and presenting many public planetarium shows on diverse topics for numerous groups on campus, including shows for high school science teachers and the UConn Museum of Natural History. Other representative activities include such things as encouraging the study of science/physics by women and minorities (e.g. with planetarium shows in the Upward Bound summer program), serving as a mentor and panelist to facilitate careers for women in mathematics, science and engineering, serving repeatedly as a judge at CT Science Fairs, helping with the Science Olympiad competition for high school students, working with Boy Scout, Girl Scout and Cub Scout

groups, judging at the state level of the CT Invention Convention for elementary school students, among many other outreach and mentoring activities. She directed the KAST (Kids are Scientists, Too)/Space Astronomy Camp for grades 5-9 in multiple summers, with the help of high school teachers and physics graduate students. KAST is part of a program to provide STEM activities to encourage young people to choose science as a career (with similar camps in other science and engineering fields).

Although Cynthia says she is retiring, we will not be surprised to see her research, mentoring and outreach activities continue well into retirement. With the Department starting 3 new faculty in astronomy, it appears that it will take at least three people to replace her. We look forward to her continued presence around the Department in the future!

Michael Rapposch's Retirement

Michael Rapposch retired from the University of Connecticut after 30 years of dedicated service to the Physics Department. Michael began his career at UConn as a graduate student in chemistry, studying crystalline structures. After receiving his Master's degree, Mike was hired as a research assistant in the Department of Physics, joining Dr. Quentin Kessel's research lab. After working in the accelerator lab for several years, Michael transitioned to a position in the physics undergraduate teaching labs. Bob Erickson and Michael ran the teaching labs together until Bob's retirement in 1999. Over the next fifteen years, Michael's skills, experience and strong work ethic helped the teaching labs through several major transitions and transformations—all in a time of ever-increasing student enrollments.

Most of Michael's work took place behind the scenes. Thousands of undergraduates benefited from his hard work over the years. Faculty members teaching lab courses, as well as graduate students, realized that Michael's technical and teaching experience made him a valuable resource. Research assistants asked him for technical advice and for assistance with their experiments. Teaching assistants came to him for advice, as well, recognizing that his advice on classroom management was inestimable; especially when they realized that every semester for twenty years, Michael taught a chemistry lab course at Eastern Connecticut State University.

Mike always had a smile for his colleagues. He was ready to help with any task, from leak detection to setting up tables for the holiday parties. Mike enjoyed working with the students, as well. He worked on the Physics Olympiad every year that it was held. He also enjoyed supporting the Kids Are Scientists Too program—even though he never let us forget the mess the students made with Jell-O lenses.

We would like to take this opportunity to extend our sincerest thanks and gratitude to Michael for his years of dedicated and conscientious service to the department. Mike was honored for his thirty years of service at the April 15, 2016 Employee Appreciation Event, but only colleagues and former students will realize how much he will be missed. Congratulations on your well-deserved retirement!

Bill Stwalley's Retirement

William C. Stwalley (Bill), Board of Trustees Distinguished Professor of Physics, has retired from teaching on June 1, 2016. He is now continuing as UConn Board of Trustees Distinguished Professor Emeritus/Research Professor of Physics and also continuing as an Affiliate Professor of Chemistry and the Institute of Material Science (IMS).

Bill has had a long and illustrious scientific career. He received his B. S. from the California Institute of Technology in 1964 (Chemistry) and his Ph.D. from Harvard University in 1969 (Physical Chemistry). Bill was an Assistant Professor (1968-72), Associate Professor (1972-75), Professor of Chemistry (1975-93), and Affiliate Professor of Physics (1977-93) at the University of Iowa. He was also Director of the Iowa Laser Facility (1978-93), Director of the Center for Laser Science and Engineering (1987-89), and the George Glockler Professor of Physical Sciences (1988-93) at the University of Iowa. Bill moved to the UConn Physics Department in 1993, where he has been a Professor (1993-2016) and Department Head (1993-2011).



Bill's research interests began with atom-atom scattering studies in molecular beams and then focused on laser spectroscopy of diatomic molecules, especially for alkali metal and other hydrogen-like atoms, and in particular their corresponding potential energy curves at large internuclear distances (long range molecules). He published a seminal paper with Nosanow in 1976 on the possibility of Bose-Einstein Condensation of spin-polarized H atoms at ultracold temperatures ($T < 1$ mK), which was ultimately achieved at MIT by Kleppner, Greytak *et al.* in 1998. He became increasingly interested in the low temperature behavior of hydrogen and hydrogen-like systems (e.g. alkali metal atoms). In 1993, attracted by the UConn Physics Department in general and the related research interests of Profs. Win Smith, Phil Gould and Juha Javanainen, he moved to UConn as Department Head. His continuing collaborative research with Profs. Ed Eyler and Phil Gould centers on the studies of ultracold atoms and molecules, especially photoassociation and formation and trapping of alkali metal diatomic molecules; laser spectroscopy, photophysics and photochemistry; laser ionization; long range molecules and potential curves; radiative transition probabilities; and quantum degenerate gases. Bill has published 338 articles in top journals in Physics and Chemistry as well as 8 books and 6 patents.

Bill's scientific achievements as well as his dedication to advancement of science were recognized by many prestigious awards, among those Leeds and Northrup Foundation Fellowship, Harvard University (1964-65), National Science Foundation Fellowship, Harvard University (1965-68), the Alfred P. Sloan Fellowship (1972-74), the William F. Meggers Award for Spectroscopy of the Optical Society of America (1998), the UConn Chancellor's Research Excellence Award (1999), the UConn Board of Trustees Distinguished Professor (2002-16) and the Connecticut Medal of Science (2005). Bill is a Fellow of the Japan Society for Promotion of Science, the American Physical Society (APS), the Optical Society of America, the Connecticut Academy of Science and Engineering, the Connecticut Academy of Arts and Sciences, and the American Association for Advancement of Science.

Bill service record includes major roles on multiple national and international committees, most notably for the American Physical Society (APS). His most significant contribution was as a co-founder of the Topical Group

on Laser Science/(now)Division of Laser Science and its annual conference, the International Laser Science Conference/(now)Annual Meeting of the Division of Laser Science. In the period 1984-92, he played a major role in both the Group (Steering Committee 1985-92, Vice Chair/Chair/Ex-Chair 1989-92) and the ILS Conference (Program Chair, Co-Chair, Chair, or Administrative Vice-Chair during 1984-91, while most of the time the conference was run out of his office at the University of Iowa). Bill was involved with development of the Quantum Electronics and Laser Science (QELS) conference, the Conference on Lasers and Electro-Optics (CLEO) meeting (jointly sponsored by APS and the Optical Society of America) and served on the QELS Program Committee in 1991-92 and 1998-99. He served on both the Joint Council on Quantum Electronics and International Quantum Electronics Conference (the oldest laser meeting in existence) in 1988-90, 1993-96, and 2000-03, chairing the ICQE from 2000-2002. In addition, Bill helped organize many national and international conferences, from Gordon Conference on Atomic and Molecular Interactions 1978; through Faraday Discussion 142 (Cold and Ultracold Molecules), Durham, England 2009.

Bill has also extensively served the Division of Atomic, Molecular and Optical Physics (DAMOP): Program Committee (1981-83, 1990-92); Fellowship Nomination Committee (1984-85); and Nominating Committee (Chair 2009-10). Bill was elected to the DAMOP "Chairline", sequentially serving as Vice Chair (2005-06), Chair-Elect (2006-07) and Chair (2007-08). In addition, he served on multiple prize committees of the APS: E. K. Plyler Prize Committee (1982), DLS Schawlow Prize Committee (1998-2000, Chair 1999-2000), H. P. Broida Prize Committee (Vice Chair/Chair 2000-02, Chair 2013-15), and I. I. Rabi Prize Committee (2010-14). In addition to the APS, Bill also served on committees of the American Chemical Society, Division of Physical Chemistry; the Optical Society of America; the Laser Institute of America; the Connecticut Academy of Science and Engineering; and chaired the Connecticut Medal of Science Selection Committee (2007-09).

Bill served many professional journals: Editorial Board, University of Iowa Press (1980-85); Editorial Advisory Board, Journal of Molecular Spectroscopy (1982-87); Editor (USA), Laser Chemistry (1985-90); Editorial Advisory Board, Chemical Physics Letters (1986-99); Editorial Advisory Board, Physical Review A (2000-02); Book Review Advisor, Physics Today (2000-10); and Editorial Board, Springer Tracts in Modern Physics (2010-present).

Bill's service list to Federal Agencies contains upward of twenty items. To name a few of his diverse roles, he served on multiple National Academy of Sciences/National Research Council advisory committees, he was the Associate Program Director for Quantum Chemistry, National Science Foundation; served on National Institute of Standards and Technology Physics Review Panel, was a Consultant to Lawrence Berkeley Lab, and served on the Air Force Steering Committee on High Energy Density Materials.

Bill's UConn service roles were also multiple and diverse. He served on the Institute of Materials Science Faculty Advisory Board (1997-2011), as Chair of the Organizing Committee for Hascoe Distinguished Lectures, (1997-2011), on the University Senate (2001-07, 2008-14), the Board of Trustees Distinguished Professor Selection

Committee (2003-06), the President's Research Administration Committee (2003-06), the University Master Plan Advisory Committee (2004-06), the UConn Foundation Close-to-Home Committee (2006-16, Co-Chair 2009-12), the NEASC UConn Reaccreditation Steering Committee (2005-07, as Chair of the Academic Program Subcommittee), the Major Centers and Institutes Review Committee (2005-2016), the Buildings and Grounds Committee (2005-13), the Provost's Commission on the Status of Women/Committee on Institutional Diversity

(2008-2012), the Board of Trustees Financial Affairs Committee (2008-12), the University Space Committee (2009-11) and the Board of Trustees Buildings, Grounds, and Environment Committee (2012-14). He also served on many search and review committees.

Bill's scientific and academic activities are truly international. He has mentored students from 11 countries, postdocs from 12 countries, and collaborated with scientists in 24 countries. Of his 338 publications, 250 were co-authored with one or more foreign or foreign-born collaborators, epitomizing the international essence of science. Bill's science and service have taken him to 58 countries in different roles such as Fellow of the Japan Society for Promotion of Science; Visiting Lecturer of the Chinese Academy of Science, NSF sponsored Lecturer in India; International Assessors Committee for Review of Canadian Physics Research; Italian Research and University Evaluation Agency (ANVUR) Reviewer; Member of the College of Reviewers of the Canadian Research Chairs Program and most recently, C. N. Yang Visiting Professor of Physics, Chinese University of Hong Kong.

Bill's scientific and academic achievements are many and impressive. He succeeded in increasing the visibility of UConn through his many contributions to the advancement of science, to the University and to the Physical and Chemical communities and societies. But on top of it all, we in Physics Department owe Bill a great debt of gratitude for his tireless efforts as the Head to nourish and support strong research orientation of the Department. Bill's efforts were always directed above all towards supporting academic excellence in any way he could and over the years of his Headship it clearly bore fruit.

Bill was instrumental in promoting growth and enhancing breadth of the Department as well as the University of Connecticut as a whole. He worked hard at increasing the ranking of the Physics Department by hiring the best professors and creating conditions conducive to carrying out excellent federally funded research. We hope that Bill will continue to share his wisdom with us in his new role as Emeritus/Research professor for many years to come.

*A Cause
for
Applause!*

*The Physics Department would like to give a heartfelt 'Thank You!' and
'Congratulations!' to Cynthia, Michael and Bill.*

Enjoy your much deserved retirement!

New Arrivals to the Physics Department

Welcome Ann Marie Carroll

Through an outside search, the Physics Department hired Ann Marie Carroll as the new laboratory technician II to replace Mike Rapposh who retired December 2015. Although Ann Marie started her new job in June 2016 she is no stranger to the Physics Department students, faculty and staff.

Ann Marie received her BS in Physics, May 2013 from UConn. While still a student, she worked as a Research Specialist in Richard Jones' Nuclear Physics research lab from May 2012 to May 2014. Her job consisted of contributing to the construction of a tagger microscope detector for the GlueX Collaboration at Thomas Jefferson National Laboratory. From June 2014 to May 2016, Ann Marie worked as a Research Assistant in Nora Berrah's Atomic, Molecular & Optical Physics research group. During these two years, Ann Marie expertly supported the group through increased scientific, technical, and administrative responsibilities. Ann Marie was extremely appreciated by Berrah's group because of her team work mentality, her work ethic and her technical and people skills to tackle and solve problems. The physics department is very fortunate to have retained Ann Marie Carroll to continue to work with us.

Welcome New APiR Instructors

A new dimension for the physics department is that we are beginning to have primarily teaching positions that are full time faculty. The university designation for this position is Assistant Professor in Residence (APiR). As of fall 2016 we will have three APiRs in the department. They include Diego Valente, Hani Duli, and Xian Wu. Diego has been in the department for a few years. He originally came as a postdoctoral researcher working with Prof. Robin Côté on AMO theory and issues of quantum computing. He then transitioned to be a full time instructor. He has championed the adoption of new teaching pedagogy that have been developed by Physics Education Research including active learning strategies and now is leading our efforts to introduce studio-based physics where courses are not taught with a separate laboratory session but rather fully integrated sessions with theory, problem solving, and lab activities woven together.

Hani Dulli comes to us from Texas Tech University. At Texas Tech Hani taught a wide array of undergraduate courses, using an active learning technique very similar to that popular with many of our own instructors here at UConn. Hani received his Ph.D. from the University of Tennessee under the supervision of Ward Plummer. At Tennessee, Hani did research on the electronic structure of surfaces using angular resolved photoemission spectroscopy.

Xian Wu has just completed his Ph.D. studies in Physics Education Research at Kansas State University. His thesis investigated course design using multimedia platforms and measuring the outcome on student learning under the supervision of Sanjay Rebello. He has had experience as a studio physics instructor, and thus brings us vital knowledge of this method of teaching as we look to develop several introductory courses on that model. Previously, Xian received his MS in physics from the University of New Hampshire, so we look forward to welcoming Xian back to New England.

New Program Assistant in Physics

Andrea Sylvester accepted the vacant program assistant position in the Physics administrative office this past spring. She was raised in Lebanon, CT and currently resides in Andover, CT with her longtime boyfriend, Matt. She enjoys various recreational activities as well as reading, cooking, and spending time with her family, especially her two nephews.



Andrea with nephews, Blake and Logan

Andrea graduated from Eastern Connecticut State University where she majored in Communication with a concentration in Business. While there she was employed as an Advanced Student Worker for Eastern's Foundation. During that time she realized her true love of the higher education environment and working with people. Andrea's professional background includes office management and administration, business management, event planning, and healthcare compliance and policy coordination.

Andrea is thrilled to be joining the UConn family and Physics department. She's eager to learn and looks forward to utilizing her experience and education as a Program Assistant for the Physics Department. In this role, she will be responsible for organizing events and carrying out payroll and human resource functions. She will also assist in the production of the annual Physics Newsletter.

She's excited to be here and to meet fellow staff, faculty and students! If you come to Physics and see her, feel free to introduce yourself and she will do the same!

Addition to Condensed Matter Physics Effort

The condensed matter physics effort has received a big boost from the arrival of Ilya Sochnikov as an Assistant Professor. Ilya is building a Scanning SQUID Microscope. The SQUID (Superconducting Quantum Interference Device) is an exquisitely sensitive sensor of magnetic fields, making this the best magnetic microscopy available. The ability to detect spatial variation in local magnetic fields opens up new vistas for studying a variety of important materials. Among those the Ilya has looked at are superconductors, nanostructures of superconductors, topological insulators, and frustrated magnetic systems. [Frustrated magnetic systems are those whose local geometry does not allow local moments to order, as in moments that want to anti-align arranged in a triangle.] Many of the most important magnetic phenomena turn on at very low temperatures. Thus one of Ilya's areas of expertise is incorporating this kind of microscope in refrigerators able to reach temperatures of a few Kelvin or even milli Kelvin. This is a measurement capability almost unmatched in the world, and holds the prospect for exciting collaborations with other condensed matter physics faculty and more broadly those in the Institute of Materials Science. Given the need for using non-renewable liquid helium for

these experiments, Ilya is coordinating an effort across the condensed matter group to develop a helium recovery and reuse system.

Ilya came to UConn during the 2015-16 academic year. Just prior to joining us he worked as a postdoctoral scholar in the laboratory of Kam Moler at Stanford University where the scanning SQUID microscope was developed. Prior to that, he received his Ph.D. from Bar Ilan University in Israel studying transport and magnetic vortices in superconductors. Already at UConn he has received an award from UConn for developing cryogenic equipment and the Silver Award from Montana Instruments for his development of the microscope. We look forward to many years of exciting new work from Ilya's lab.

Astronomy Updates

This past spring the Physics Department established a new Astronomy group by hiring three outstanding, young, up-and-coming astronomers: Dr. Cara Battersby, Dr. Jonathan Trump, and Dr. Kate Whitaker. All hold prestigious national fellowships, and rose to the top of an incredibly well qualified and diverse pool of almost two hundred applicants. The eight interviewees invited to the department this past spring comprised the strongest group for a search in memory, and the strong support from Department Head Berrah and CLAS Dean Teitlebaum was crucial to the success of the endeavor.

The new group instantly gives UConn national recognition, and with strong connections to Astronomy powers like the Harvard Smithsonian Center for Astrophysics, UMass Amherst, and Yale, among others. We expect the group to establish a strong presence in New England, as they all have local roots here.

Cara and Kate hail from Massachusetts and Jonathan from Pennsylvania (unfortunately, they all support the Red Sox (why Jonathan?) which almost derailed the search before it got off the ground since the head of the search committee is a well-known Yankees fan).

Dr. Cara Battersby is currently an NSF and SMA fellow at the Harvard-Smithsonian Center for Astrophysics. She is a leader in observations of star and cluster formation and galactic structure. She received her Ph.D. in Astrophysics from the University of Colorado in 2013 after obtaining her M.A. in Astronomy at Boston University and B.S. in Physics and Astronomy from UMass Amherst. Cara has already developed an impressive research and teaching record, having mentored eight undergrads so far. Officially starting at UConn this fall, Cara will be on leave until Fall 2017 at the Center for Astrophysics, but we hope to see her often at UConn during the next year.

Dr. Jonathan Trump comes to UConn as a Hubble Fellow working at Penn State since 2013. Before that, he was a postdoc at UC Santa Cruz, and earned his Ph.D. in Astronomy at the University of Arizona in 2010. He earned B.S. degrees in Physics and Astronomy from Penn State. Jonathan is a recognized expert in spatially resolved spectroscopy and time domain observations, tools he uses to study black hole growth and evolution. He is a leader in the large galaxy surveys CANDELS and Sloan Digital Sky Survey. Jonathan has also compiled an impressive research record.

Dr. Kate Whitaker took her Hubble Fellowship to UMass Amherst in 2015 after a NASA PP Fellowship at Goddard Space Flight Center. Kate earned her Ph.D. at Yale in 2012 after receiving a B.S. in Physics and Astronomy at UMass Amherst and M.S. and M.Phil. degrees at Yale. Dr. Whitaker uses the Hubble Space Telescope to study galaxy origin and evolution. She also has a strong record in research and mentoring undergrads. Like Cara, Kate will be on leave from UConn for the 2016-17 academic year, continuing her

research at UMass. However, she and her family will move to Storrs this summer, and Kate plans to be at the department often during the upcoming year.

All three are well positioned to take advantage of current and coming large astronomical instruments like the Hubble and James Webb space telescopes, Atacama Large Millimeter Array, and the Large Synoptic Survey Telescope. These instruments will make the next great astronomical discoveries, and we are delighted that three such remarkably talented and motivated researchers will allow us and our students to be part of this awesome exploration of Our Universe. Please join us in welcoming the new Astronomy Group to the Physics Department at UConn!

Obituaries

Remembering Dr. Theodore Raymond Fischer

Friday, January 8, 2015, Dr. Theodore Raymond Fischer of Canterbury, NH passed away after a valiant, 9-year battle with Lewy Body Dementia in hospice at The Birches at Concord.

Ted was a kind, generous, and caring man with a quick wit. He cared deeply about his family and others and loved to talk about sports, movie trivia, and anything technical. His hobbies included reading, sports, science, and activities with his family.

Ted was born in Mount Vernon, NY on May 14, 1946, to F. Raymond and J. Winifred Fischer. He is survived by his wife of 36 years, Peggy Fischer and their son Matthew, his sister-in-law, Carol Huntington of Concord, two brothers and their spouses, William and Marla Fischer of Charlottesville, VA, Jack and Sandy Fischer of Trophy Club, TX, his brother-in-law Glenn Lever and spouse Anne and their children Arthur and George of Rochester, NY, three nephews and their spouses, Devin and Kristin Fischer and their son Dylan of Seattle, WA, Ben and Sarah Huntington of Newmarket, NH, and Andy and Alyssa Huntington and their children Blair and Wells of Concord, NH, and a niece, Jaclyn of Trophy Club, TX.

Ted joined the US Army in October of 1971 and served in the Third Army in South Carolina before being deployed to a Hawk Missile Battalion at Ramstein Air Force Base in Kaiserslautern, Germany.

Ted received a Bachelor of Science degree in Physics from the University of Maryland, a Master's of Science in Physics from the University of Connecticut and went on to receive his Ph.D. as a Theoretical Solid State Physicist from the University of Connecticut.

He was employed for over 26 years at the Army Night Vision and Electronic Sensors Directorate Ft. Belvoir, VA, and the Army Research Laboratory, Adelphi, MD, where he served as a physicist in the analysis and development of infrared detector technology and had numerous publications, presentations and commendations credited to him.

In lieu of flowers, the family requests donations are made in Ted's name to the Lewy Body Dementia Association, 912 Killian Hill Rd SW, Lilburn, GA 30047 (404-935-6444) or online at LBDA@LBDA.org.

Remembering Edouard Paradis

Edouard L. Paradis, 86 of Manchester, CT, husband of the late Patricia P. "Trish" (DeFelice) Paradis, died Monday, February 16, 2015 at an area convalescent home. Ed was born in Willimantic, CT on July 15, 1928, son of Leopold and Blanche (Houle) Paradis. He was raised in Willimantic, served in the US Army, and graduated

from Trinity College with a Master's Degree. He had been a Manchester resident since 1990 and prior to retiring he was a nuclear physicist at UTC Pratt & Whitney in East Hartford. Ed was a longtime parishioner of St. James Church in Manchester and a member of the church choir. In his younger years he was an avid snow skier and later in life enjoyed traveling all over the world with Trish. He is survived by his sister, Dolores Landry and her husband William of Norwich, CT, their daughter Susan, and his church choir friends. Besides his wife Ed was predeceased by his brother and sister, Gerard Paradis and Lucille Rocheleau.

To leave a message for his family please visit: www.holmes-watkinsfuneralhomes.com or to read more, visit: <http://www.legacy.com/obituaries/hartfordcourant/obituary.aspx?pid=174209021#sthash.z30neuFl.dpuf>

Endowment News

The Physics Department is very grateful for your contributions to our many endowed and non-endowed funds, which enable us to significantly enhance our educational and research missions in a variety of ways, as well as those of UConn. A primary use of the funds is to support deserving graduate students, but other uses include distinguished lectures, undergraduate and graduate student awards, an undergraduate research fund, research-related funds, and a general Physics Dept. fund. A list of these funds is provided on page 22 where you can also find information on the various funds in the UConn Research Foundation which support the Physics Dept. in numerous important ways. The entire department is grateful to those of you who contribute to these funds and thereby provide important assistance that significantly enhances our department's educational and research missions.

We will be hosting our 19th annual Katzenstein Distinguished Lecture October 28, 2016 to be presented again by a Nobel Laureate, Prof. Leon N. Cooper, the Thomas J. Watson, Sr. Professor of Science and Director of the Institute for Brain and Neural Systems at Brown University. This lecture is supported by an endowment established by Drs. Henry and Constance Katzenstein, Henry having been the first student awarded a Ph.D. in Physics at UConn!

The Katzenstein endowment annually provides a \$250 prize and plaque of recognition for the best paper by an undergraduate Physics major. This year the Katzenstein Prize was awarded to Michael Cantara for his paper "The energy-momentum structure and D-term of Q-clouds" based on his undergraduate research with Prof. Peter Schweitzer. Michael, who also carried out undergraduate research with Prof. Bill Stwalley, won a national award from NASA, a Goldwater Scholarship, and an NSF Graduate Fellowship for his upcoming graduate studies in Physics at MIT, and is also currently a Finalist for the Apker Award for Undergraduate Research of the American Physical Society. The runner-up for the Katzenstein Prize was Issac Packtor for his paper "Field Dependence of the RF Surface Resistance of Superconductors".

The Edward Pollack Endowment for Physics, initiated by Ed's family and many friends, supports the annual Pollack Distinguished Lecture in Atomic, Molecular, and Optical Physics. Another example of our funds is the

Dwight Hills Damon Graduate Fellowship in Experimental Physics, provided by Dwight's family and many friends, which again this year is providing a summer research fellowship to one of our most outstanding graduate students, Jonathan Kwolek in the research group of Prof. Win Smith. On the following pages, you can

find details about the various funds in the UConn Research Foundation which support the Physics Dept. in numerous important ways. The entire department is grateful to those of you who contribute to these funds and thereby provide important assistance that significantly enhances our department's educational and research missions.

Non-Endowed Funds

Edouard Paradis Award**

- 20351 Physics Department
- 20366 Physics Thermoluminescence Lab
- 21706 Norman Hascoe Lecture Series
- 22398 Space-time Twisting by Light Project
- 22457 Time Domain Fund
- 22520 Edward N. Frisius Memorial Fellowship
- 22662 Anne and Win Smith Fellowship Fund

Endowed Funds

- 30438 Katzenstein Endowment in Physics
- 30641 Charles E. Swenberg Memorial Scholarship Fund
- 30723 Nagavarapu Graduate Award in Physics
- 30743 Issac S. and Lois W. Blonder Graduate Fellowship in Physics
- 30876 Marshall and Georgianna Walker Graduate Award Fund
- 30911 Kurt Haller Endowment for Physics Research and Graduate Education
- 30951 Ruth and Paul Klemens Endowment
- 30958 Edward Pollack Endowment for Physics
- 31028 Dwight Hills Damon Graduate Fellowship in Experimental Physics
- 31224 Kurt Haller Academic Opportunity Fellowship Fund
- 31409 Mark E. Miller Undergraduate Research Fund

Making a Gift:

There are many ways of making a gift to the UConn Foundation in support of the Physics Department, including checks, marketable securities, planned or estate gifts and through payroll deduction for UConn employees. Checks should be made payable to the University of Connecticut Foundation, with a cover note directing your gift. All gifts are eligible as 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. If you are interested in the possibility of establishing a new fund, please contact our Department Head Prof. Nora Berrah, and/or our Administrative Manager, Alessandra Introvigne.

***The Physics Department has received a \$50,000 gift from the Estate of Edouard Paradis. This gift will support scholarships for students enrolled in the Physics Program at UConn. We are indebted of his generosity.*

UConn Foundation Department of Physics Funds Donation Page

I/We would like to support the Physics Department Programs. Please direct my gift of \$ _____ to the fund (s) listed below. Please include the amount of the donation (if designating to various funds), name and number of fund (s):

Matching Gift

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

My company is: _____

Should you choose to support one of these funds, you can send your contribution directly to the University of Connecticut Foundation. Please include the fund name and number on your check:

University of Connecticut Foundation

2390 Alumni Drive, Unit 3206

Storrs, CT 06269-3206

We greatly appreciate your support!

SAVE THE DATE: Friday October 28, 2016

Invitations for the Katzenstein lecture and dinner will be sent out in early September. If you are interested in attending but do not receive your invitation by the end of September, please contact:

Andrea Sylvester

Phone: 860-486-4924

Email: andrea.sylvester@uconn.edu