A few weeks ago, we held a Departmental Appreciation Luncheon for all faculty, staff and students. Not the typical activity for 301 Van Allen Hall, a room where many of our advanced undergraduate and graduate courses are taught, it was nevertheless a comfortable place to get together for a meal. The event started as an opportunity to honor Bill Kurth and Don Kirchner for their UI Outstanding Staff and Regents’ Staff Excellence Awards, and it evolved into a broader event to recognize the wide range of contributions to our collective efforts in many arenas at the University.

We celebrated the achievements of members of the department, including a record in grants and contracts, at $21 million for the last fiscal year. You’ll see listed in this newsletter some of the awards earned by faculty members for their scholarly contributions and in the case of Tom Bogness, also exceptional leadership in service to the University. A number of our students have been recognized within the university and in national competitions. Prof. Solomon Bililign (PhD, 1991) returned to campus in September to accept a College of Liberal Arts and Sciences Alumni Fellow award for his leadership in atmospheric chemistry and physics as well as his continued advocacy for scientific collaboration between American and African scientists.

A group not represented at the Luncheon is the group of our friends and alumni, many of whom donate funds to support students and the activities of the department. On behalf of the department, I thank our contributors for their continued engagement with the department.

It has been an exciting and rewarding year. For those of you who are passing through Iowa City, we would welcome your visit to show you what is new in the Department, both in Van Allen Hall and at the Iowa Advanced Technology Center.

— Mary Hall Reno

**FY2010 a Record Year for External Funding**

Fiscal year 2010 was another record year for external research funding for the Department, with more than $21 million received in grants and contracts. The majority of the funding went towards space physics research (66%), with the Radiation Belt Storm Probes (RBSP), the Juno Waves Investigation, and the Cassini Radio and Plasma Wave Science (RPWS) Investigation being the biggest award recipients.

The remainder of the funding came to particle and nuclear physics, astronomy and astrophysics, condensed matter physics and plasma physics. Funding agencies included NASA, the U.S. Departments of Energy and Defense, and the National Science Foundation.

Thanks to excellent faculty and research programs, the Department continues to secure funding that not only advances research, but also benefits students by providing educational and career opportunities. About two-thirds of our graduate students are supported as research assistants (with the remainder on teaching assistantships and fellowships), and many undergraduates do research with our faculty. Funding also supports some student travel to present research at conferences and workshops. Through these additional resources, our students greatly increase their likelihood of success following college.
Faculty Directory

Astronomy/Astrophysics
Kenneth Gayley, Assoc. Professor
Philip Kaaret, Professor
Cornelia Lang, Assoc. Professor
Randall McEntaffer, Assistant Professor
Robert Mutel, Professor
Steven Spangler, Professor
John Neff, Professor Emeritus

Atmospheric & Environmental Physics
John Neff, Professor Emeritus
Steven Spangler, Professor
Robert Mutel, Professor
Randall McEntaffer, Assistant Professor
Cornelia Lang, Assoc. Professor
Philip Kaaret, Professor
Kenneth Gayley, Assoc. Professor

Condensed Matter/Materials Physics
Paul Kleiber, Professor

Elementary Particle Physics
Theoretical
Michael Flatté, Professor
Craig Pryor, Assistant Professor
John Schweitzer, Professor Emeritus
Experimental
Thomas Boggess, Professor
John Prineas, Associate Professor
Arthur Smirl, Professor
Markus Wohlgenannt, Associate Professor

Nuclear Physics
Theoretical
Wayne Polyzou, Professor
William Klink, Professor Emeritus
Gerald Payne, Professor Emeritus
Experimental
Edwin Norbeck, Professor Emeritus

Faculty Highlights/Research

Visiting Assistant Professor Ugur Akgun received a TeraGrid startup award of 400,000 cpu hours for his project titled, “Molecular Dynamic Simulations to Determine the Solute Selectivity of Ammonia Channels.”

Prof. Thomas Boggess was named a Collegiate Fellow in the College of Liberal Arts and Sciences. The five-year renewable award is given to senior faculty whose distinction in teaching and scholarship is matched by exceptional leadership in service to the university, the college and their departments. Awardees meet annually with Dean Linda Maxson, UI Alumni Association Dean’s Chair of the college, and the college’s associate deans to discuss ways of improving faculty life and undergraduate education. The award is supported by a gift from the late R.F. and Maryon E. Ladwig for discretionary teaching and research funds.

Prof. Boggess was one of six UI faculty to receive the 2010 Regents Award for Faculty Excellence. The award is given by the State of Iowa Board of Regents and honors faculty for significant contributions to excellence in public education.

Professor John Goree received a grant from NASA to lead the U.S. team of investigators who will carry out experiments using an instrument that the European Space Agency (ESA) plans to put on the International Space Station (ISS). The instrument is called PLASMALAB. It will have a vacuum chamber and high-voltage electrodes to make a partially-ionized gas, or plasma. Polymer microspheres will be injected into the plasma, and they will gain an electric charge. The result is what is called a dusty plasma. A powerful laser will be used to push the microspheres around, while high-speed video cameras will be used to observe the collection motion of the microspheres. The scientific goals include a study of phase transitions such as the melting transition, where each microsphere in the dusty plasma serves as a simulation of a molecule in ordinary solids or liquids.

The scientific efforts for the PLASMALAB include physicists in many countries, led by a group in Germany. The U.S. team consists of Professor Goree, who serves as the team leader, along with researchers at the University of California at San Diego and Auburn University.

Professor Goree’s research group, including Dr. Bin Liu and graduate student Amit Mukhopadhyay, also carry out research on the PK-3 Plus instrument, which is already in orbit on the International Space Station. Data are recorded on computer hard disks that are brought to Earth aboard Soyuz capsules, and then distributed to participating scientists.

The PK-3 Plus instrument is expected to be succeeded in the next few years by PK-4, which is now in the final stages of design. PLASMALAB is expected to follow PK-4 in this sequence of dusty-plasma instruments aboard the ISS.

Prof. Philip Kaaret and Hua Feng of Tsinghua University in China, colleague and former UI postdoctoral student, found evidence of the existence of two medium-sized black holes close to the center of nearby starburst galaxy, M82, located 12 million light years from Earth. Using NASA’s Chandra X-ray Observatory and ESA’s XMM-Newton spacecraft, the data which was collected showed that the black holes avoided falling into the galactic center, which may help scientists understand the beginnings of supermassive black holes in other galaxies, including the Milky Way galaxy.

Professor William Klink, who joined the Department in September 1965, has retired from his position as professor. We greatly appreciate his 45 years of service to the University and wish him the best in his retirement.

Cornelia Lang was promoted to Associate Professor and achieved tenure.

Professor Karl Lonngren is a co-author with Prof. Akira Hirose, Professor of Physics at the University of Saskatchewan, on the book, Fundamentals of Wave Phenomena – Second Edition, which was published by SciTech Publishing, Inc. in 2010.

As of January 1, 2010, Prof. Lonngren has retired from the University of Iowa.
Faculty Highlights/Research

Associate Professor Jane Nachtman received tenure this past year.

The years of work by Professors Yasar Onel, Edwin Norbeck, Jane Nachtman, and Charles Newsom along with a number of Iowa graduate and undergraduate students, postdocs and engineers to build detectors for the CMS experiment at the LHC are finally paying off. The Large Hadron Collider has been supplying proton-proton collisions for most of this year at the record breaking center of mass energy of 7 TeV. Parts of the huge HF (Hadron Forward) detector and the smaller Zero Degree Calorimeter were designed and constructed by the Iowa group with considerable help from the Physics Machine shop. The group is now looking at real collision data and making improvements in the detectors. Most of the expected known particles have been seen in the data, but it may take years to find answers to such big questions as where the mass of elementary particles comes from, what the dark matter observed in galaxies consists of, and whether supersymmetry and the extra dimensions proposed by string theory really exist. At these energies each collision produces thousands of particles, but only one collision in a trillion provides information about the big questions. This makes finding a needle in a haystack seem easy.

Wayne Polyzou was elected as vice chair of the International Light Cone Advisory Committee (ILCAC). The ILCAC sponsors annual workshops all over the world on applications of light-front quantum field theory and light-front quantum mechanics to problems in particle and nuclear physics.

Professor John Prineas received funding for a three-year, $385,000 grant from the NSF entitled, “Defect Formation and Phase Transitions in 2-5 Micron GaInAsSb Semiconductor Quaternary Alloys versus Ga(In)Sb/InAs Short Period Superlattices.”

Mary Hall Reno was elected a Fellow of the American Physical Society (APS), for contributions to the physics of neutrino interactions and detection, especially at high energies.

Professor John Schweitzer retired from teaching this year after 44 years of service to the Department. We wish him the best in his retirement.

Jack Scudder was elected a Fellow of the American Geophysical Union (AGU). The honor, which is reserved for those who have made exceptional scientific contributions, cited Prof. Scudder “for fundamental contributions to understanding the processes that control collisionless plasmas.” He will receive a medal at the awards ceremony at the December 2010 AGU meeting.

Prof. Steven Spangler was elected a Fellow of the American Physical Society (APS), for fundamental advances in theory and radio-astronomical observations for a wide range of turbulent astrophysical plasmas and nonlinear Alfvén waves.

New Faculty

The Department welcomes Maxim Khodas, whose appointment as Assistant Professor will begin in January 2011.

Khodas received his M.S. degree at the Technion-Israel Institute of Technology, Haifa, and his Ph.D. degree at the Weizmann Institute of Science, Rehovot, Israel. He completed his postdoctoral research at the William I. Fine Theoretical Physics Institute, University of Minnesota, Minneapolis, and is currently a Joint Research Associate and Goldhaber Fellow in the Condensed Matter Physics & Material Science Department and Physics Department at Brookhaven National Laboratory in New York. His research interests include low dimensional systems of interacting fermions and bosons, and systems of cold atoms, quantum critical fluctuations in strongly correlated systems, transport properties of disordered systems of interacting electrons, non-linear quantum and classical dynamics, and fundamentals of spintronic devices.
Students Receiving Degrees

Undergraduate

Andrew Awad, B.S. physics & astronomy
James Chambliss, B.S. applied physics
Quentin Collier, B.A. physics
Maria Drout, B.S. physics & astronomy
Christopher Moore, B.S. physics & astronomy with a Spanish minor
Peter Montag, B.S. physics & mathematics
John Morris, B.S. physics
Matthew Ryan, B.S. physics & astronomy
Adam Turner, B.S. astronomy
Kristin Wood, B.A. physics

Graduate

Güral Aydin, Ph.D. experimental particle (assistant professor, Musta Kemel University - Turkey)
Alexander Bulmahn, Ph.D. particle theory (adjunct assistant professor, University of Montana)
Amritanand De, Ph.D. theoretical condensed matter (postdoc, University of Wisconsin-Madison)
Yan Feng, Ph.D. plasma physics
Yusuf Günyadin, Ph.D. experimental particle (assistant professor, Kahramanamaras Sutcu Iman University)
Theodore Jaeger, Ph.D. astrophysics (Naval Research Laboratory)
Arda Konik, Ph.D. medical physics (University of Massachusetts)
Andrew Kopf, Ph.D. space physics
Oney Soykal, Ph.D. condensed matter (postdoc, Laboratory for Physics Sciences, University of Maryland)
Kory Stiffler, Ph.D. particle theory (postdoc, University of Maryland, College Park)
Catherine Whiting, M.S. astronomy (Ph.D. program, University of Iowa)

Graduate/Undergraduate News

2009-2010 Awards and Scholarships

This past academic year, students received the following awards:

Brian D. Strayer and Richard L. Rairden Scholarship in Physics
Johnathan Kingyon
Nolan Grieves (renewal)

Distinguished Service Award
Maria R. Drout

James A. Van Allen Award
Maria R. Drout
Peter K. Montag
Mark L. Tucker

Myrtle K. Maier Scholarship
Suzanne H. Carter
Alicia A. Maxwell (renewal)

Waldo Edward & Martha Althaus Smith Award
Christopher R. King

William R. Savage Memorial Award
Peter J. Foster

Goertz/Nicholson Memorial Scholarship
Kevin D. Nielson

John and Stacey Wahl Scholarship Award
Bradly K. Button

D’Angelo Scholarship
Feng Chu

We congratulate all of our students for their academic, teaching, and research excellence.

Fall Enrollment Numbers

Fall 2010 student enrollment statistics for the Department are as follows:

Total undergraduate students—128
New students—37
Male students—109
Female students—19

Total graduate students—74
New students—15
The new grad students come from Bangladesh, China, Kuwait, Mexico, Turkey (2) and the USA (9).

Domestic students—47
International students—27
Male students—59
Female students—15

Staff News

Awards & Recognition

In March 2010, the College of Liberal Arts & Sciences held its 10th Annual Staff Recognition Reception, and recognized the following with longevity awards:

Scott Allendorf – 20 years
Deborah Foreman – 10 years
Richard Huff – 30 years
Christopher Piker – 10 years

Also this past year, the University recognized several staff members for their work excellence.

Board of Regents Staff Excellence Award
Donald Kirchner

University of Iowa Outstanding Staff Award
William Kurth

Improving Our Workplace, Team Award
Kristine Sigsbee
(Research Professional Development Work Team - Biomedical Series)

Aaron Votroubek
(2007-2008 Staff Recognition Committee)

Retirements

We wish the best of luck to Richard Huff, Robert Neppl, and Larry Schroeder who retired after many years serving the department and University.
Chu Awarded First D’Angelo Scholarship

New graduate student Feng Chu was awarded the D’Angelo Scholarship. This scholarship was funded recently by gifts to the Department in honor of Nicola D’Angelo, who was Professor of Physics at The University of Iowa from 1976 to 2006, and died in November of last year. The scholarship is a one-time award of $1,000 for the 2010-2011 academic year, which supplements the student’s financial support from a Teaching Assistantship.

Mr. Chu is interested in experimental plasma physics, which was Professor D’Angelo’s primary research area while at Iowa. Mr. Chu received his undergraduate degree from the University of Science and Technology in China. He began his graduate study at the University of Houston, and he transferred to our Department this year. Professor D’Angelo was a plasma physicist who received his doctorate from the University of Rome in 1953. During his distinguished career, at Princeton University’s Plasma Physics Laboratory he developed the Q-Machine plasma device, a design that continues to be used in laboratories around the world for basic physics laboratory experiments with plasma waves. He performed experiments with high-altitude balloons launched while he was a scientist in Denmark. Afterwards, he was director of the European Space Research Institute (ESRIN) in Italy. He then joined The University of Iowa, where his accomplishments include the first experimental observation of the dust-acoustic wave, which is a wave that is excited by ion currents in dusty plasmas.

Physics Library Joins the Sciences Library

During the summer of 2010, the Physics Library became part of the newly renamed Sciences Library located across from Van Allen Hall behind the Biology Building at 120 Iowa Avenue. The Sciences Library includes books, journals, reference, and reserve for the departments of biological sciences, physics and astronomy, and geosciences as well as reference and reserve for the chemistry and psychology departments. The Science Library can be accessed on the web at http://www.lib.uiowa.edu/sciences/.

New Science Teacher Degree Program Developed

The College of Liberal Arts and Sciences, the College of Education and the Graduate College have collaborated to develop a new, five-year combined bachelor’s degree and master’s degree program which addresses the national shortage of science teachers. The program, which is meant for students interested in teaching secondary school science, began this fall and provides students the opportunity to earn a bachelor’s degree in biology, chemistry or physics in four years, followed by a master’s degree in teaching earned during the fifth year. The program will be very attractive to UI students interested in teaching high school science.
Hawk-Eyes on Science Outreach Program

The Hawk-Eyes on Science program had an outstanding year garnering several grants, including one very prestigious, competitive, and highly sought after grant. This substantial grant from the American Physical Society was for the development and presentation of “LaserFest” activities in conjunction with the 50th year anniversary of the invention of the laser. The highlight of our programs on lasers was our Departmental Demonstration Show in February. A large group of undergraduate and graduate students presented laser demonstrations about communications, optical information storage, the wavelengths of lasers, sizes and types of lasers, measurements with lasers, and a “LaserFest” song with total audience participation. Everyone really had a great time. Many of the large scale demonstrations from this show were morphed into smaller scale traveling demonstrations that we have been using in our rolling outreach programs for the remainder of 2010. From March 13th until July 15th 2010, the Department had an exhibit called “50 Years of Laser Innovation” in the North Exhibition Hall of the UI’s Main Library. The exhibit explored the past, present and future of the laser and also included an interactive laser display.

We also welcomed faculty member Greg Howes to our program as one of our “on call” presenters.

This year the Hawk-Eyes on Science began a new collaboration with Regina High School. Through a partnership with John Goupell, the new physics teacher at Regina, the Hawk-Eyes on Science and the Department of Physics and Astronomy has donated up to $8,000 in old equipment and has loaned several other pieces of equipment to Regina. This includes a laser diffraction kit, nine graphic interfaces that can be linked to student computers, and a $10,000 oscilloscope on loan. Regina students have seen and will continue to see some of the demonstrations being performed by Dr. Cornelia Lang and the UI Society of Physics Students (SPS) as well as several students from the Science Education Department throughout the year. The project will bridge the science communities at the high school and college level which will improve the transition to college for the high school students while preparing college students for service to the public.

If you’d like to be involved in outreach activities as a presenter or volunteer for the Department, contact the coordinators, Dale Stille (dale-stille@uiowa.edu) or Vincent Rodgers (vincent-rodgers@uiowa.edu).

Your support benefits Physics and Astronomy education and research!

To make a contribution, go to the Department’s online gift web site at

http://www.givetoiowa.org/physics

Your gifts are greatly appreciated!
Alumni

David Dittmer (MS 1961) received his PhD in nuclear physics from the University of Pittsburgh, and has worked for 36 years at the Center for Naval Analyses where he is currently a consultant. He also spent 12 years on international assignments in Europe and Japan. Since graduation, Julia Elspeth Nelson (BS 2008) has been working at Casimir Jones, S.C., a biotechnological patent firm in Madison, WI, as a legal assistant/annuity specialist. In September 2010 she will be leaving to go to Africa for two years to teach math and science through the Peace Corps.

Christina Othon (BS 2000) is now an assistant professor at Wesleyan University in Middletown, Conn.

Kavita Philip (MS 1989) is an associate professor at the University of California, Irvine.

Kevin Jan Sun (BS 1989) is a Sr. Marketing Manager with Applied Materials China in Shanghai.

Deaths


Richard Willett (BA 1951), died 10/10/2009.

Alum Bililign Named 2010 Alumni Fellow

Professor Solomon Bililign (Ph.D., 1991) was named one of six Alumni Fellows for 2010 by the UI College of Liberal Arts and Sciences (CLAS). Prof. Bililign was given the award for recognition as a leader in atmospheric chemistry and physics, and also for his work as an advocate for international research collaboration between American and African scientists. He is a professor in the physics department at North Carolina A & T State University, and director of the National Oceanic and Atmospheric Administration-Interdisciplinary Scientific Environmental Technology Cooperative Science Center (NOAA-ISETCSC). NOAA-ISETCSC is a project devoted to atmospheric science and weather-related research which involves a collaboration of ethnically diverse scientists, engineers and meteorologists from eight institutions. As a member of the Ethiopian Physics Society and the National Society of Black Physicists, he continues to work to attract underrepresented groups to the environmental sciences. In September, Prof. Bililign visited the UI campus and gave a public lecture entitled, “Research and education in geosciences – the need for an all inclusive interdisciplinary approach to address problems of global significance.” He also visited classes and met with faculty and students.

Alumni Reunion Held This Summer

Over the weekend of July 10th, Jim Kasper, Brent Studer, and Alan Tribble (with help from many others) organized a reunion of Physics and Astronomy graduate students from the 80’s and early 90’s. About 50 people (coming from both the west and east coasts, and from Texas and Minnesota) were able to attend at least one of the events. Some highlights from the weekend included a tour of the Physics and Astronomy department (special thanks to George Hospodarsky and Professors Reno, Prineas, and Skiff), telescope viewing (thanks to Jim Kasper and Brent Studer), and a reunion performance of the band (Jim Kasper, Grant Denn, Tracy Ellis, Julia Anderson, and Tak Sakurai) that played at many of the department holiday parties in the early 90’s. There was interest in holding another reunion in a few years, possibly in the Colorado or Baltimore area. If you would like to be contacted about possible future events, please send an email to george-hospodarsky@uiowa.edu.

Be part of the next newsletter!

Send us your latest alumni accomplishments by submitting online at www.physics.uiowa.edu/alumni/ and click the “Alumni Update Form” link. We look forward to hearing from you soon!
Alumni Update Form

To update our mailing list and include your latest accomplishments in the next newsletter, complete the form below and return it to Aaron Votroubek, Department of Physics and Astronomy, 211 Van Allen Hall, The University of Iowa, Iowa City, IA 52242-1479. Or submit your information electronically by completing the alumni update form online at http://www.physics.uiowa.edu/alumni/update.html. We look forward to hearing from you soon!

Name
First Middle Last

Home Address
City State Zip

Employer
Title

Work Address
City State Zip

Home Phone Email

Year Graduated Degree

Career Accomplishments and Other Information

☐ Yes, I would be willing to serve as a mentor for a graduate or undergraduate student.