LSU LOUISIANA STATE UNIVERSITY

PHYSICS & ASTRONOMY NEWSLETTER

Spring 2007 http://www.phys.lsu.edu

CHAIRMAN'S WELCOME . . . *by Roger McNeil*

Welcome to our Spring 2007 newsletter. There have been lots of changes since our last newsletter.

The department has had a number of changes in our staff. In April of 2006, the College Machine Shop was merged with the Department's Machine Shop resulting in the addition of George Gascon to our Machine Shop as well as additional shop space and machines. In May, one of our Grants Coordinators, Andre Crawford, left to accept another position with LSU. Rachel Collyer was hired to replace him. In August, Rochelle Grayer resigned her position. In January 2007, Sarah Phillips was hired into a newly created position of Coordinator of Academic Support. Finally, Allen Young retired in February 2007 from the department after serving for 35 years in the Machine Shop, the last 15 of which was as Shop Manager. George Gascon has been appointed Manager of the Machine Shop.

This has been a busy year for recruiting of new faculty members to our department. In the summer of 2006, we hired two full time instructors, Dubravka Rupnik and Iftikhar Ahmad. Also in spring 2007, Dr. Polad Shikhaliev came to LSU from the University of California at Irvine. His research is in the area of medical imaging physics. The department currently has three faculty searches taking place in the areas of experimental condensed matter physics, theoretical condensed matter physics and experimental nuclear physics. We hope soon to hire outstanding faculty members to strengthen these research areas to support the education and training of students. We have had two faculty departures since our last newsletter. Paul Kirk retired in August 2006 after 35 years with the department, and Robert Svoboda resigned in November 2006 to take a joint position with the University of California at Davis and Lawrence Livermore National Laboratory (LLNL). You'll recall from our last newsletter that Dr. Svoboda was on leave at LLNL after his house in New Orleans was severely damaged by Hurricane Katrina. We hope to begin a new round of faculty searches in the fall of 2007.

We had a great year with our students. Since our last newsletter, we graduated 18 B.S. degrees, 4 M.S. degrees in Medical Physics/Health Physics and 3 Ph.D. degrees. A full listing of our graduates is included in this newsletter edition. In February 2007, the College of Basic Sciences held its annual scholarship breakfast where the first two Greg Hussey Scholarships for Undergraduate Physics were awarded to Brendan Watson (2006) and Nicholas Van Meter (2007). Our students continue to grow in number with about 100 undergraduate majors and over 80 graduate students. This is an active time of year for recruiting of students and we are continuing our efforts to recruit outstanding students into both our undergraduate and graduate programs

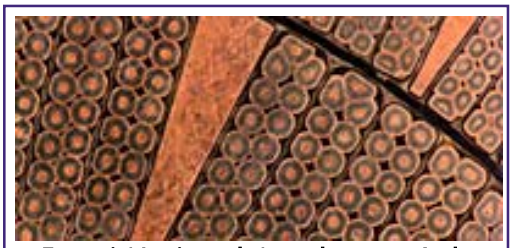
There were two great news items this past November in our medical physics program: The program was reviewed by the Commission on Accreditation of Medical Physics Education Programs and then received word that our program has been accredited. This places our program among only a dozen elite programs in North America. Also, at the same time, the department and college received a gift from Dr. Charles M. Smith, which when combined with a matching contribution from Mary Bird Perkins Cancer Center establishes the Charles M. Smith Chair in Medical Physics.

We also have good news that LSU Physics Alumnus Byrd Ball and Alice Ball have made another contribution on The Ball Family Professorship to make it a triple Professorship, the first of its kind in the College of Basic Sciences. The College of Basic Sciences' Development Team of Ann Marie Marmande, John Grubb, Francis Watson, and Julie Tessier has been active at raising private funds for the department, organizing an annual drive that will bring needed dollars to the department's accounts supporting students, distinguished visitors, and faculty research initiatives. We have several funds that are deserving of support including the Greg Hussey Undergraduate Scholarship, the Joseph Callaway Graduate Fellowship, the Ganesh Chanmugam Dissertation Award, the Highland Road Park Observatory Fund, the Telescope Fund, the Medical Physics Fund, the Theory Fund, and the Department's Development Fund. These funds will help to provide important discretionary dollars to the college and department, encourage and also further distinguish our accomplished faculty as leaders and partners in LSU's growth and success. We hope you will consider joining our efforts to build a tradition of giving in the Department. If you would like to contribute, please fill out the back page of this newsletter.

Finally, I informed the faculty and staff this past month that I will be leaving the department and university at the end of the spring to accept the position of Founding Dean of the College of Natural Sciences at California State University – Stanislaus. This has been a very difficult decision for me and my family as I have been over 20 years with LSU and I love the university and community. But I feel this is a wonderful opportunity for me to pursue my interests in science education and to shape the identity of a new college. I will very much miss you all.

Magnetic Protection

Reprinted with permission from http://focus.aps.org/story/v17/st12
Physical Review Focus http://focus.aps.org vol. 17, story 12, 5 April 2006.



Fermi National Accelerator Lab

Wired for magnetism. The superconductivity of wires like these breaks down when the magnetic field gets too high, which limits the strength of the field these coils can generate. A newly discovered effect increases the breakdown field by ten times, although so far it only works in a nanometers-thick, layered

Superconductors and magnets don't get along. A strong enough magnetic field destroys superconductivity by disrupting the precisely coordinated motion of electrons that allows a current to flow without resistance. In the 31 March PRL, researchers describe how the addition of a gold nanolayer to a thin superconducting film allows the material to sustain higher magnetic fields before failing. The results may offer clues toward designing superconducting wires better able to operate in the presence of magnetic fields, such as those used in MRI magnets and particle accelerators. Further studies of the effect may also improve researchers' understanding of the electron pairing that is at the heart of superconductivity.

In a superconductor, current is carried by so-called Cooper pairs of electrons. Typically, the paired electrons have opposite spin and opposite momentum--at any moment in time, one could be spin-up, moving left, the other spin-down, moving right. A magnetic field exerts forces that try to unbalance the electrons' momentum and also align both spins with the field direction. But because it takes a certain amount of energy to disrupt the Cooper pairs, a superconductor can tolerate magnetism up to a point before reverting to a normally conducting state.

Phil Adams and his colleagues at Louisiana State University in Baton Rouge built 2- to 30-nanometer-thick layers of beryllium, a superconductor, on a glass substrate, then deposited a half-nanometer gold film on top. The researchers found that the gold-coated beryllium films, when placed in a magnetic field aligned parallel to the layers, remained superconducting in fields far stronger than beryllium alone could withstand. For the thinnest film, just two nanometers thick, the critical magnetic field increased by ten times.

Physicists have known for some decades that a variety of "proximity effects" arise at an interface between a superconducting and a non-superconducting material, because Cooper pairs can leak into the normal material a little way, while the normal atoms exert an influence into the superconductor. In this case, Adams and his coauthors say, the crucial ingredient is an interaction between the electron spins and the large positive charges of the gold nuclei.

Because the electrons and the nuclei are moving relative to each other, each charge experiences the other as a current, and currents generate magnetic fields. The field the electrons feel coming from the gold nuclei--which is much larger than that of the smaller beryllium nuclei--nudges the electron spins in each Cooper pair away from exactly opposite alignment. These distorted pairs are better able to accommodate an external magnetic field because their reoriented spins are closer to what the magnetic field prefers. But if the field isn't parallel to the layers, it turns out that it can destroy superconductivity by interfering with the momentum balance of the pairs, rather than disrupting the spins.

Though practical applications are a long way off, Adams sees potential for designing superconducting wires in

Magnetic Protection

- - Physical Review FOCUS, 5 April 2006 *(Contd. from Page 2)*

the form of multilayered sandwiches. Coils of these wires might reach stronger fields than those of today's superconducting magnets, which are used in MRI machines and physics research. The possibility of tweaking a superconductor's properties through control of its microstructure is a "hot topic," agrees Venkat Chandrasekhar of Northwestern University in Evenston, Illinois. The novel effect Adams and his colleagues have demonstrated, he adds, may help researchers studying the Cooper pairings of the high-temperature ceramic superconductors, whose superconductivity is still not fully understood.

- - David Lindley

David Lindley is a freelance writer in Arlington, Virginia, and author of Degrees of Kelvin: A Tale of Genius, Invention, and Tragedy (Joseph Henry Press, March 2004).

"Spin Proximity Effect in Ultrathin Superconducting Be- Au Bilayers,"
X.S. Wu, P.W. Adams, Y. Yang, and R.L. McCarley,
Phys. Rev. Lett. **96**, 127002
(issue of 31 March 2006)

FACULTY AWARDS

Gabriela González is the recipient of the **2006 Edward Bouchet Award of the American Physical Society (APS)**. The Edward Bouchet Award promotes the participation of under-represented minorities in physics by identifying and recognizing a distinguished minority physicist who has made significant contributions to physics research. The program will help publicize the lecturer's work and career development to the physics community, especially among minority physics students.

Jerry P. Draayer is the recipient of the **2006 SESAPS Francis C. Slack Award**. This award is given by the Southeastern Section of the American Physical Society.

Michael Cherry is the recipient of the **2007 LSU Alumni Association Faculty Excellence Award**.

Juhan Frank is the recipient of the **2007 Tiger Athletic Foundation President's Award**.

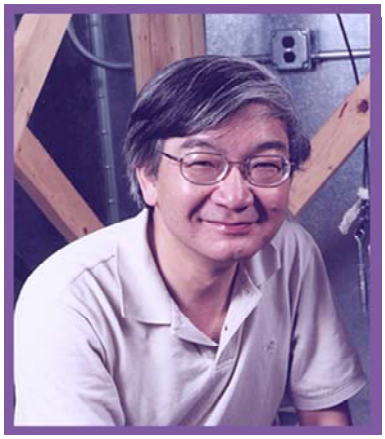
Richard L. Kurtz is the recipient of the **2007 LSU Distinguished Faculty Award**.

FACULTY AWARDS *(Contd. from Page 3)*

Ed Seidel is the recipient of the **2006 Sidney Fernbach Prize of the IEEE**. The Sidney Fernbach Prize is presented annually by the IEEE Computer Society to an individual for "an outstanding contribution in the application of high performance computers using innovative approaches." It was established in 1992 by the Board of Governors of the IEEE Computer Society. It honors the memory of the late Dr. Sidney Fernbach, one of the pioneers in the development and application of high performance computers for the solution of large computational problems.

Rainer Weiss is the recipient of the **2006 Einstein Prize of the American Physical Society (APS)**. Dr. Weiss is Professor Emeritus at Massachusetts Institute of Technology (MIT) and Adjunct Professor at LSU. The Einstein Prize recognizes outstanding accomplishments in the field of gravitational physics and is awarded biennially in odd-numbered years.

John Gibbons, Adjunct Associate Professor was named **Fellow of the American College of Medical Physics**.



Max Goodrich Distinguished Lectureship Series Speaker

Moses H.W. Chan
Evan Pugh Professor of Physics
Pennsylvania State University

Member, National Academy of Sciences, and Fritz London Prize recipient.

Wednesday, February 7, 2007 - 5:00 PM
109 Nicholson Hall
(A reception at the LSU Faculty Club followed the lecture.)

"Einstein's Legacy in Low Temperature Physics: Superfluids and Supersolids"

Einstein, building on the idea of Satyendra Bose, made the remarkable prediction that a collection of certain particles, known as bosons, will at sufficiently low temperature lose their individual identities and behaves as one giant 'atom'. This transformation, known as Bose-Einstein condensation, was observed in liquid helium nearly 70 years ago and in the vapor phase 10 years ago. Below 2.176K, liquid helium becomes a frictionless superfluid with a multitude of amazing properties, not imagined even by Einstein. Even more extraordinarily, solid helium was recently found (1-4) in the laboratory to show the same amazing properties- it becomes what is now known as a 'supersolid' i.e., a solid which can flow like a superfluid, without any resistance, through even atomic-size holes. This public lecture will explain in simple terms how such incredible behavior is possible.

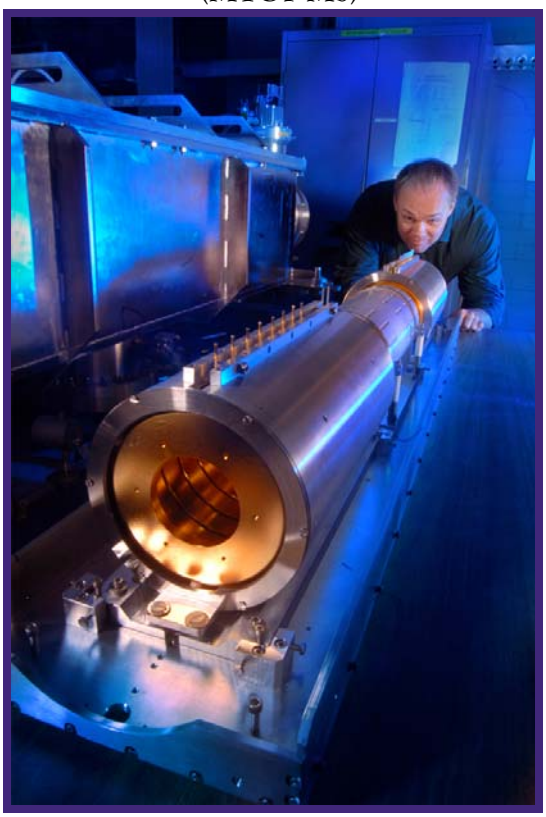
Dr. Chan also presented the Departmental General Seminar on Thursday, February 8, 2007:

"Critical Casimir Forces"

One of the most beautiful aspects of physics is how phenomena in widely different systems are described by the same mathematical formulation. In electromagnetism, the Casimir force is due to the confinement of zero-point electromagnetic fluctuations between two conducting plates a finite distance apart. In a completely analogous way, the confinement of critical fluctuation in an adsorbed film leads a thickness dependence correction to the free energy of the film and, therefore a critical Casimir force between the interfaces of the film. The existence of the critical Casimir force was confirmed by measuring the thickness of He-4 film adsorbed on solid substrates as the system is brought through the superfluid, or lambda, transition. A thinning of the adsorbed film driven by the attractive force between the liquid-vapor and the liquid-copper interface is found (1, 2). A repulsive critical Casimir force near the He-3-He-4 tricritical point was also found (3).

RESEARCH SPOTLIGHTS

Multi-Pass Time-of-Flight Mass Separator (MTOF-MS)

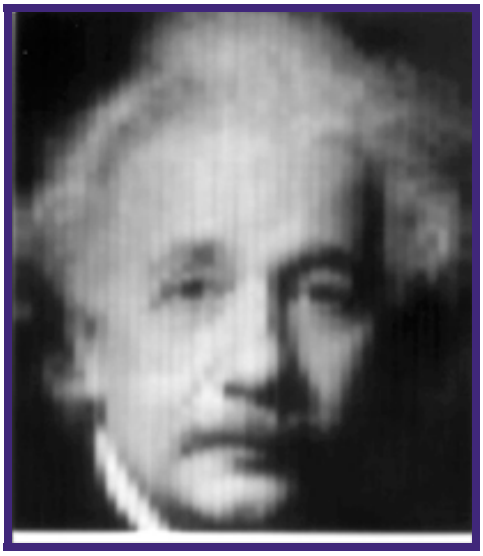


Shown is a new type of Multi-Pass Time-of Flight Mass Separator (MTOF-MS) for research in nuclear structure physics and nuclear astrophysics. All of the components were constructed in the department's Machine Shop, and are shown during assembly by Andreas Piechaczek, a Research Associate working with Professor Emeritus Edward Zganjar. Note the gold-plated electrostatic lens element. When MTOF-MS is operational, experiments of great importance to nuclear structure and nuclear astrophysics, currently impossible, will become feasible.

Q: What did the Nuclear Physicist have for lunch?

A: Fission Chips

Medical Physics & Health Physics



This image (MLC_Einstein.jpg) illustrates the degree of precision with which modern radiation therapy systems can deliver radiation. A typical intensity-modulated radiation therapy (IMRT) system comprises a linear accelerator (linac) that produces x-rays or electron beams and multi-leaf collimators (MLCs) that shape the radiation beam. Individual tungsten leaves in the MLC move in/out of the beam to create the shape of the irradiated area. By blocking the beam for varying amounts of time in varying locations, IMRT can also manipulate the total amount (intensity) of radiation reaching various parts of the target area. This ability of IMRT to control the shape and intensity of the radiation beam provides the ability to maximize the amount of radiation delivered to a tumor (to kill it) while sparing surrounding healthy tissue as much as possible. The image of Albert Einstein was created by an IMRT system. A scanned photo of Einstein was used to program the linac and MLC to deliver the desired intensity of radiation to each region of the image. Black colors in the photo result in a high intensity of radiation being delivered while white areas receive none; the shades of grey are achieved by delivering proportional amounts between these two extremes. The vertical streaks apparent in the image result from the relative movements of adjacent tungsten leaves in the MLC.

Kenneth "Kip" Matthews, II, Assistant Professor

Faculty & Staff Focus, Honors & Awards, Research

Sudbury Neutrino Observatory Team Wins First John C. Polanyi Prize

LSU researchers among those honored

- - LSU NEWS, November 16, 2006, 11:56 AM

Thomas Kutter

Jason Goon

Kevin McBryde

Research scientists at the Sudbury Neutrino Observatory, or SNO, gathered yesterday to receive the first John C. Polanyi prize of the Natural Sciences and Engineering Research Council of Canada, or NSERC. Several LSU researchers are among those being honored.

The award, honoring John Polanyi, the 1986 Nobel Laureate in chemistry, is given annually to an individual or team whose research, conducted in Canada, has led to a recent outstanding advance in an NSERC-supported field of the natural sciences or engineering. The SNO collaboration team has used the observatory, a unique neutrino telescope located approximately one and a half miles underground near Sudbury, Ontario, for groundbreaking research that has significantly added to the understanding of the universe.

LSU has been involved with SNO since the fall of 2004, when Thomas Kutter came to the campus as an assistant professor of physics and astronomy. He was previously involved in SNO during his work at the University of British Columbia in Vancouver. Once at LSU, Kutter worked to make the university a member institution of the SNO collaboration, recruiting Jason Goon, a postdoctoral researcher, and Kevin McBryde, a graduate student, to work on the project. The group concentrates on data analysis and SNO operations, typically spending two to three weeks at a time in Sudbury to perform maintenance tasks and assure the proper functioning of the experiment.

The LSU-SNO team's analysis focuses on the measurement of low-energy backgrounds and the extraction of neutrino signals. Neutrinos are very evasive neutral particles that were long thought to be mass-less and which are known to come in three different types: electron, muon and tau. This information helps the team to learn about neutrino properties and the complex energy generation processes taking place in the interior of the sun.

"The employed analysis techniques involve computer simulations which are extremely resource intensive," said Kutter. "We are fortunate to make use of the existing computing environment at LSU and are taking advantage of on-campus resources such as SuperMike, our supercomputer."

The team also celebrated a measurement milestone – the completion of the successful operations with heavy water for the SNO detector. Heavy water, a rare natural occurrence found at trace levels in some lake and river water, is chemically the same as regular water, but with the two hydrogen atoms replaced with deuterium atoms. Deuterium has an additional neutron, which makes water as much as 10 percent heavier. The heavy water gives SNO the unique ability to detect all three types of neutrinos.

This feature allowed SNO scientists to conclusively demonstrate that solar neutrinos are changing their type en route to Earth. This transformation appears to arise from a finite mass of neutrinos, a finding that requires the laws of physics to be modified at a

Sudbury Neutrino Observatory Team Wins First John C. Polanyi Prize

LSU researchers among those honored *(Contd. from Page 6)*

very fundamental level. The observations also resolved the 30-year-old "Solar Neutrino Problem," a large discrepancy between earlier measurements by other laboratories not sensitive to all three types of neutrinos and the predictions of theories of the Sun.

"It is a pleasure to be involved in an experiment whose results require physics text books to be updated," said Kutter.

For more information about SNO, please visit http://www.sno.phy.queensu.ca/ or contact Thomas Kutter at kutter@phys.lsu.edu or 225-578-8310.

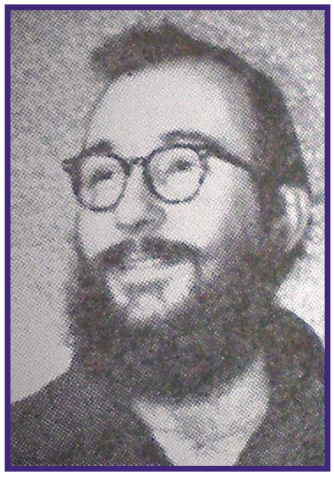
by Ashley Berthelot, LSU Media Relations

DEPARTMENTAL FUNDING NOTES -

Fiscal Year 2005-2006

Our Physics and Astronomy Department remains one of the leading LSU departments with regards to total grants and contracts. During the 2005-2006 fiscal year, over $5.9 million in extramural funding was generated by our faculty for both research and education purposes. This funding comes through a variety of federal agencies (NSF, DOE, NASA, DARPA), state agencies, and private sources.

During last fiscal year, there were well over 100 active grants and contracts, and thus cannot be enumerated here. However, many are inter-departmental and multi-institutional; a strong testament of our department's multi-disciplinary research efforts. Moreover, by far the majority of our faculty is currently funded.



Arlo Landolt

On Tuesday, February 12, 1957, "small, studious Arlo U. Landolt, our twenty-year-old aurora and airglow specialist" set foot at the South Pole. He was still there to record the signals from the first artificial satellite, Sputnik 1, launched October 4, 1957. Many people who rely on Arlo's superlative work in astronomical photometry are unaware that he was in the first ever winter crew at the South Pole Station, newly constructed for International Geophysical Year. One of only 18 people that winter (8 scientists under the leadership of Paul Siple, and 8 navy men under Lieutenant Jack Tuck), Arlo, "a man of eternal good spirits possessed of an infectious laugh," made a continuous record of Aurora Australis with a spectrograph and an all-sky camera, later meticulously recording data on punched cards for subsequent analysis.

Many activities are underway for International Polar Year in 2007, celebrating the 50th anniversary of IGY and the establishment of a human presence at the South Pole, which has been continuously occupied ever since. However, it would not be right to allow such a significant anniversary to pass unnoticed by the community Arlo has so well served for so long.

Quotations, and the illustration, are taken from "*90° South: The Story of the American South Pole Conquest*," by Paul Siple (G.P. Putnam's Sons, 1959).

Reprinted from AAS Newsletter - March/April 2007, Issue 134.

WELCOME . . . New Faculty - Postdoctoral Researchers - Staff - Graduate Students

• FACULTY •

Iftikhar Ahmad, Instructor
Dubravka Rupnik, Instructor
Polad Shikhaliev, Assistant Professor, Med. Phys.

• POSTDOCTORAL RESEARCHERS •

Alexei Dorofeev (J. Matthews)
Javier Gonzalez (R. McNeil)
Romain Gouaty (G. Gonzalez)
Jaroslaw Nowak (W. Metcalf)
Asoka Sekharan (P. Sprunger)
Sulakshana "Sue" Thanvanthri (J. Dowling)
Christoph Wildfeuer (J. Dowling)

• STAFF •

Rachel Collyer, Purchasing
George Gascon, Manager, Machine Shop
Sarah Phillips, Coordinator

GONE WIRELESS . . .

As of mid February 2007, Nicholson Hall has gone completely wireless.

"Our Department is enjoying the positive impact of the LSU network 2010 Project with the deployment of 43 wireless access points in Nicholson Hall. This network is providing wireless coverage to our entire building and coupled with the upgrade of our switches and routers to accommodate the soon to come 10Gb line connecting Nicholson Hall to the Campus core network, we will have "state-of-the-art" access to the Internet and other IT resources", says Hortensia Valdes, Physics Computer Systems Administrator.

Information Technology Services (ITS) has been in the process of providing full coverage wireless access to the entire campus . . . building by building.

Authentication is obtained via PAWS accounts. However , guests to the Department of Physics and Astronomy will be able to go out onto the WWW much easier through the new wireless access.

INCOMING GRADUATE STUDENTS

- Andrews, Jennifer - Astronomy
  BS, College of Charleston
- Blasi, Olivier - Medical Physics
  BS, University of Wyoming
- Chawla, Sarvnipun - Relativity
  BS, Punjab University
- Collazzi, Andrew - Astronomy
  BS, Vanderbilt University
- Eley, John - Medical Physics
  BS, College of Charleston
- Erickson, Michael - Quantum
  BS, Univ. of California, Los Angeles
- Gau, Yang - Astronomy
  BS, Harbin Institute of Technology
- Jung, Yang - Astronomy
  BS, Sejong University
- Lonsberry, Natalie - Medical Physics
  BS, University of Arkansas
- McCracken, Steven - Theory
  BS, Francis Marion College
- Mingireanu, Florin - Relativity
  BS, Louisiana State University (BR)
- Mou, Weiwei - Condensed Matter
  BS, Univ. of Science & Technology of China
- Racine, Todd - Medical Physics
  BS, Ball State University
- Rebar, Drew - Condensed Matter
  BS, Bob Jones University
- Robertson, Chad - Medical Physics
  BS, Louisiana Tech University
- Rodi, James - Astronomy
  BS, Louisiana State University (BR)
- Thibodaux, Joshua - Condensed Matter
  BS, University of Alabama
- Wu, Hengkui - Condensed Matter
  BS, Beijing Normal University
- Yuan, Guofeng - High Energy
  BS, Univ. of Science & Technology of China
- Zhang, Yuan - Astrophysics
  BS, Univ. of Science & Technology of China
- Zhang, Ziyu - Condensed Matter
  BS, Tsinghua University

STUDENT HONORS & AWARDS

College of Basic Sciences Awards Annual Scholarships

Pictured from left to right is Department Chair Roger McNeil, Nickolas M. Vanmeter, Dr. Greg Hussey, Basic Sciences Dean Kevin R. Carman, Brendan M. Watson, and Mrs. Joan Hussey.

The College of Basic Sciences held its annual scholarship breakfast on Tuesday, February 6, 2007 at the LSU Faculty Club.

The R. Greg Hussey Scholarship in the Department of Physics and Astronomy is awarded annually to a student who is showing exceptional promise both in the classroom and in research. The fellowship was made possible by a donation from Professor and Mrs. Greg Hussey. Dr. Hussey was a member of the Department faculty for 43 years and also served as Associate Dean of the College of Basic Sciences from 1971-2000.

The 2006 recipient of the scholarship is Brendan M. Watson, and the 2007 recipient of the scholarship is Nickolas M. Vanmeter. These recipients will be referred to as Greg Hussey Undergraduate Scholars in Physics and Astronomy. Nickolas Vanmeter was also named as a 2006 Goldwater Scholar. Congratulations!

http://www.phys.lsu.edu/dept/endowments

• NEWS •

- LSU Professor Hosts "Ask the Astronomer" Event at Highland Road Park Observatory - T. Gregory Guzik began hosting the "Ask the Astronomer" at the BREC-LSU-BRAS Highland Road Park Observatory on Saturday, January 27, from 8:00-9:00 PM - the event is free and open to the public. This event is a limited series held on the last Saturday of each month.
- Associate Professor, Joseph A. Giaime, has been named head of the Laser Interferometer Gravitational Wave Observatory, or LIGO, based in Livingston, Louisiana. The LIGO Laboratory is managed by Caltech and funded by the National Science Foundation.
- The American Institute of Physics (AIP) and the IEEE-Computer Society have appointed Professor Joel Tohline as an editor of the Visualizations department for their technical magazine *Computing in Science and Engineering*.
- Professor Philip Adams has been selected as a Fellow of the American Physical Society (APS).
- Professor Jorge Pullin has been selected as a Fellow of the American Association for the Advancement of Science (AAAS).
- NASA Balloon Carries High Altitude Student Platform to the Edge of Space - NASA has teamed with LSU and student groups from 4 universities for a launch that carried the first flight of High Altitude Student Platform (HASP) to the near space environment of the upper atmosphere. Student teams designed and developed experiments during the academic year and then integrated the experiments with the platofrm during the summer. For more information on HASP, visit *http://laspace.lsu.edu/hasp/*

For more information on these and other News items, visit us on the web at

http://www.phys.lsu.edu/dept/news/

Faculty & Staff Focus, General Information, Research, Science & Technology

Endowed Chair Supports Cancer Research Through LSU and Mary Bird Perkins Cancer Center Partnership

Dr. Charles M. Smith Chair of Medical Physics Established

- - LSU NEWS, November 20, 2006, 11:24 AM

Baton Rouge, LA – A newly endowed chair in medical physics at LSU is one of just a few in the nation and the only one in Louisiana. The Dr. Charles M. Smith Chair of Medical Physics will provide support for important cancer research initiatives within the medical physics program.

"Endowed chairs are one of the greatest assets a university has," said Kenneth Hogstrom, director of LSU's medical physics program and chief of physics at Mary Bird Perkins Cancer Center. "In addition to providing long-term stability for our program, it will provide funding for research and help to recruit outstanding, talented faculty and graduate students to the medical physics program in the future."

The chair is one element of an innovative education and research partnership formed in 2004 between LSU and Mary Bird Perkins that was initiated as part of an effort to bring Dr. Hogstrom to Baton Rouge. Hogstrom, who serves at both LSU and Mary Bird Perkins, is one of the world's foremost scholars in the area of medical physics and is the former department chair of radiation physics and director of the graduate medical physics program for The University of Texas M. D. Anderson Cancer Center in Houston.

The new medical physics chair was funded by donations from both LSU and Mary Bird Perkins. LSU donor Dr. Charles M. Smith contributed $300,000 of the $600,000 required to establish an endowed chair at LSU. Contributors to a recent capital fund drive conducted by Mary Bird Perkins made it possible for the center to match Dr. Smith's donation. Together, these donations qualify for $400,000 in matching dollars from the Louisiana Board of Regents Support Fund to provide a $1 million endowment. Endowed chairs provide vital, ongoing funding for research and academic study rather than a one-time gift.

The funding for this chair is unique because an individual and an organization joined forces to make it happen. "This is an outstanding example of how a flagship university and the community can come together in a dynamic way to benefit and advance cancer research," said Louis D. Curet, co-chairman of the Mary Bird Perkins 2004 Capital Campaign that raised more than $2 million from hundreds of community donors. The campaign's goals included helping fund the partnership between LSU and MBPCC and raising the $300,000 for its portion of the match to the LSU Foundation.

"The community really stepped up to support the establishment of this chair, a critical building block for the education, research and development that LSU and Mary Bird Perkins will provide to patients and their families," said Todd D. Stevens, president and CEO of Mary Bird Perkins Cancer Center.

Smith, the LSU donor, saw the significance of his donation from both a medical and academic perspective. "Making this gift is important to me both as a physician and graduate of LSU," said Smith, who is from Sulphur, LA.

He was motivated to make his gift to LSU by his passion for patient care and his desire to make an impact on cancer treatment in Louisiana and beyond. "The more I learn about the LSU - MBPCC partnership, the more excited I get about the medical physics program. This chair is key to ensuring the long-

Endowed Chair Supports Cancer Research Through LSU and Mary Bird Perkins Cancer Center Partnership

Dr. Charles M. Smith Chair of Medical Physics Established

(Contd. from Page 10)

term success of the partnership, and I know what a difference it will make. The partnership will drive significant cancer research and help train clinical medical physicists – both leading to improved care for cancer patients."

The next step for the endowed chair is for LSU to review credentials from top level medical physics researchers and appoint someone to the post, a process to be completed in the near future.The LSU-Mary Bird Perkins medical physics partnership and endowed chair will assist LSU in recruiting new scholars and researchers. The program, a combination of academia with clinical medicine, will ultimately benefit cancer patients by facilitating research that offers potential for increasing cure and reducing side effects. In addition to research in radiation therapy and medical imaging, the partnership is focused on enhancing LSU's medical physics program. The program's goal is to become one of fewer than a dozen accredited medical physics graduate programs in the country, helping to fill a nationwide shortage of critically-needed medical physicists. Nationally there is a need for approximately 300 new medical physicists per year. The academic and research partnership is part of Mary Bird Perkins' standing as a Center of Excellence and fits within LSU's Flagship Agenda.

Medical physics is primarily an applied branch of physics that is concerned with the applications of concepts and methods of physics to the diagnosis and treatment of disease, including cancer. In cancer care, medical physicists are part of the medical treatment team, working closely with physicians to ensure that patients receive the best possible quality of patient care. They are responsible for the highly technical aspects of applications of radiologic equipment used to diagnose and treat cancer and provide research and development to produce new technology that improves the quality of diagnosing and treating cancer.

For more information about Mary Bird Perkins Cancer Center and the Medical Physics and Health Physics Program at LSU, please visit www.marybird.org or www.phys.lsu.edu and click on "graduate programs."

by Ashley Berthelot, LSU Media Relations

NEWSLETTER STAFF

Editors
Roger McNeil, Chair
Phil Sprunger

Designer
Karen Richard

Community Outreach, Research

LSU Medical Physics Program Gains Full Accreditation

Partnership with Mary Bird Perkins provides research in cancer treatment

- - LSU NEWS, December 22, 2006, 3:25 PM

The LSU and Mary Bird Perkins Cancer Center, or MBPCC, Medical Physics and Health Physics Program, one of only 10 in the U.S., has recently been granted full accreditation from the Commission on Accreditation of Medical Physics Educational Programs, Inc., or CAMPEP.

"CAMPEP accreditation demonstrates that the LSU Medical Physics and Health Physics Program meets national standards. This public acknowledgement provides national status to the program, which will help future recruitment of graduate students and faculty," said Kenneth Hogstrom, director of the program and chief of physics at MBPCC. "Accreditation was possible due to the joint support of LSU and MBPCC for the program and the dedicated work of our faculty and staff. Our goal is to far exceed accreditation standards, which means we will continue to strive to improve the education and research components of our program."

The medical physics program, which recently received a newly endowed chair position, the Dr. Charles M. Smith Chair of Medical Physics, is a landmark achievement that combines academia with clinical medicine in order to facilitate research and assist with the nationwide shortage of medical physicists. CAMPEP accreditation will go a long way toward recruiting and attracting talented students and faculty to the university and the institute, an important step in addressing the shortage.

Medical physics is primarily concerned with applications of concepts and methods of physics to the diagnosis and treatment of diseases, including cancer. Medical physicists serve as integral members of cancer care teams, responsible for the highly technical aspects of radiological equipment application. They also provide research and development to provide new and potentially life-saving advances in treatment and diagnosis.

Accreditation is a voluntary, non-governmental process of peer review utilized to verify that a particular program or institution has met uniform standards. CAMPEP's accreditation process involves seven steps:

* The preparation of a self-evaluation by the institution applying for accreditation;

* The review of this self-evaluation by the CAMPEP Residency Education Program Review Committee;

* Any questions or concerns will then be communicated to the residency education program director for a response;

* after all questions are settled, a site visit will be scheduled;

* afterward, the CAMPEP site visit team will submit a summary and recommendation to the CAMPEP Board of Directors;

* and, finally, the CAMPEP Board of Directors makes a final decision, which is then communicated to the applicant institution.

Full accreditation is valid for five years, at which time programs are required to submit to reevaluation.

For more information regarding the Medical Physics and Health Physics Program at LSU and the Mary Bird Perkins Cancer Center, please visit www.phys.lsu.edu and click on "graduate programs," or visit www.marybird.org.

by Ashley Berthelot, LSU Media Relations


C A M P E P
Commission on Accreditation of Medical Physics Education Programs, Inc.

Certificate of Accreditation

Be it known by all who view this that the

M.S. in Medical Physics and Health Physics Program
Louisiana State University and A&M College

in collaboration with

Mary Bird Perkins Cancer Center
Baton Rouge, Louisiana

having been carefully evaluated and examined, has been accredited by the Commission on Accreditation of Medical Physics Education Programs, Inc. until 31 December 2011.

Brenda G. Clark, Ph.D.
President and Chairman of the Board

CAMPEP SEAL

15 December 2006

Sponsoring Organizations:
American Association of Physicists in Medicine
American College of Radiology
American College of Medical Physics
Canadian College of Physicists in Medicine

James B. Smathers, Ph.D.
Secretary/Treasurer

RETIREMENTS

Retirement message: "Knowing is not enough"

Few individuals really know the careers that they will ultimately choose before they reach thirty, very few before they reach high school. **Paul Kirk** is among the very few. I'm not sure if it was before or after he calculated the energy equivalent of his mass at age 10 that he knew he would be a scientist. However, I am sure that by the time he reviewed his calculations with his mother that his path was set. I did not meet Paul at Princeton or MIT where he completed his formal scientific training. Our paths crossed soon after he joined the LSU physics department and I was a student in his Modern Physics class. Though he was among the best of the many fine instructors at LSU, it was in the laboratory that he excelled. Using his expertise gained from deep elastic scattering experiments at Argonne National Lab, Paul became one of the founders of the field of Relativistic Heavy Ion (RHI) Physics. I was lucky enough to work with him on his pioneering RHI experiment at Lawrence Berkeley Laboratory (LBL) which probed the nucleon distribution and possible internal clustering of the lithium-6 nucleus. It was during the follow-on experiments to that study, that Paul began his investigation of di-leptons and their use in the investigation of the quark structure of the nucleus and the search for the quark-gluon plasma. That search for knowledge of the quark structure of matter took him from the LBL Bevalac to the AGS at Brookhaven National Laboratory to look for strangelets and other exotic forms of composite quark matter. With the opening of the Relativistic Heavy Ion Collider at BNL, Paul joined the Phenix collaboration and returned to his study of di-leptons as a probe of the quark structure in the nucleus. His interest in di-leptons has most recently taken him to Fermi Lab, where he is currently a member of the E866/NuSea Collaboration.

I owe Paul Kirk a great debt. My Ph.D is a testament to his skills as a mentor, not least of which is his limitless patience. It was from him I learned the intoxicating effect of, starting with only a question, how to design an experiment that would reveal the answer, recruit a team of like-minded individuals, build the experiment, take the data, ferret out the signals from the bugs and background, and finally reveal the answer to the world. Now they tell me he is retiring. While I can believe he might retire from the meetings and the other bureaucracies imposed on academics by the administration, I doubt he could ever retire from science. For I believe, should you chance to meet him on a trail in the outback and he has that faraway look… if he is not contemplating the beauty of the natural surrounding, you can bet he is devising an elegant experiment to test the existence of the color glass condensate or some equally intriguing elusive. Finally I would like to say, Thanks for teaching me that "knowing is not enough, it is what you do that counts".

by Dr. Jon Engelage,
Lawrence Berkeley National Laboratory

Dr. Engelage is Dr. Kirk's former Research Assistant

Early memories from Dr. Roy G. Goodrich -

Paul Kirk was one of the people who had a hand in raising the bar on what students should have learned to pass the introductory Physics courses as well as the undergraduate majors courses.

At the time he first arrived at LSU, he was assigned the only remaining "makeshift" office in the basement of old Nicholson Hall. If students wanted to meet with him during his office hours, they had a dfficult time even finding his hidden away office. When the proposal to remodel and make the latest addition to the Physics building was written, one of the things that made it occur, was a picture of Paul sitting at his desk in his very dingy, small and crowded office. Fortunately, after a few years, the Dean's office was moved out of the building and he then occupied a more student friendly office.

RETIREMENTS

E. Allen Young, Manager of the Physics and Astronomy Machine Shop, retired after 35 years of service to the Department and the University.

Allen, a Louisiana native, set upon a career in machine work through 4 years of formal education in that area. He then joined the U.S. Army where for 8 years he was a specialist in the repair and maintenance of military equipment. He was chosen in 1959 as *Most Outstanding NCO*. After leaving the military, he moved into a shop that produced high performance racing engines. Allen then moved into R&D, becoming a member of the NASA Research and Development team (as a Boeing Aircraft employee) working on the Apollo Mission. He became Foreman of a 125-person machine shop, and in recognition of his work during those years, NASA honored him with two awards for the design of tooling holders on the Apollo vehicle, and one award for 2500 hours of work with zero defects. Some of Allen's work remains on the moon today. After NASA completed the Apollo Mission, Allen came to Baton Rouge to be a supervisor of an industrial backup organization that built heat exchangers for the petrochemical industry. It was from this position that Allen came to LSU, 35 years ago.

Allen not only brought a wealth of experience to his job in the Department's Machine Shop, but he brought something even more valuable – an innovative spirit and the ability to assist the experimentalists in the design and development of the instruments they envisioned. Allen became Manager of the Machine Shop 15 years ago. As manager, and as one of the Shop's highly skilled machinists, he has contributed to the success of countless experimental programs in Physics and Astronomy, as well as to a number of other departments and LSU organizations. Scientific instruments constructed in the Physics and Astronomy shop span a broad spectrum of size, extending from very tiny masks for CAMD to the very large ATIC cosmic ray detector system that has twice flown by helium-filled balloon around Antarctica. They have also spanned a broad spectrum of sophistication, with many being a *one-of-a-kind* device or apparatus. Examples of these extend from a then *state-of-the-art* two-star photometer for astronomy to an array of spectrometers for nuclear and particle physics research used at a variety of particle accelerators around the world. For example, the best conversion-electron spectrometers (world-wide) were produced in the department's shops, and a neutron detector array constructed more than 20 years ago is still being used. Other examples, involving high precision devices, highly polished light-guides, and high-vacuum technology could be cited.

Allen's dedication and service to the department and university over these many years is greatly appreciated. Thank you Allen.

CONGRATULATIONS TO OUR GRADUATES!

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Evan John Anzalone (B.S.)
Hallie Elizabeth Baer (B.S.)
Daniel Cliffor Cox (B.S.)
Travis Joh Halphen (B.S.)
Adam Lee Hawley (B.S.)
Shayna Lynn Loebig (B.S.)
Travis Clay Matthews (B.S.)
Jack Rivers McGee (B.S.)
Hans Ludwig Helo (B.S.)
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James Craig Rodi (B.S.)
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Matthew Selman Walker (B.S.)
Mitsuko Murakami (Ph.D.)

SUMMER 2006

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John Dudley Richert (M.S.-Medical Physics)
Song Guo (Ph.D.)

FALL 2007

Michael Sissay Ashenafi (M.S.-Medical Physics)
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