

Alumni News and Information for Future Newsletters

We want to keep in touch with you and need current information concerning YOU. Please let us know where you are and what you are doing. Take a moment and complete the following form and return it to us at the address: Chair, Department of Physics and Astronomy, Wayne State University, Detroit, MI 48201. Alternatively, please send us an email with the following information to rnaik@wayne.edu and/or wadehra@wayne.edu.

Name _____

Year of Graduation _____

Degree _____

E-mail _____

Your current position (title and employer) _____

News: items of interest - What are you doing? _____

Matters
Physics and Astronomy

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Physics *and* Astronomy Matters

a newsletter for alumni and friends of the
DEPARTMENT of PHYSICS and ASTRONOMY
at WAYNE STATE UNIVERSITY

WINTER 2011

www.clas.wayne.edu/physics/

New Members of the Physics Faculty



Takeshi Sakamoto

as an assistant professor in the fall of 2009. He received his Ph.D. in physics from Kanazawa University, Japan, and worked as a

In order to continue to build our department's research strength in biophysics and nanophysics, we hired two new faculty members during the last two years.

Dr. Takeshi Sakamoto joined our department as a postdoctoral research fellow at the National Institute of Health in Bethesda, Maryland, before joining our department. His research focuses on investigating the motion of single molecule motor proteins to understand how the molecular motors convert chemical energy into mechanical work. Motor proteins are the work horses of our cells, moving chemical cargo and re-arranging the interior of the cell. During his Ph.D, Sakamoto developed a new system to

directly visualize the movement of a myosin motor protein based on total internal reflection fluorescent microscopy.

Sakamoto's research at Wayne State University focuses on two major projects. First, he and others are still pursuing the detailed mechanism of how myosin moves and converts chemical energy into mechanical motion. Second, Sakamoto and colleagues discovered a new actin binding protein, called TRIOBP, in stereocilia of inner hair cells. They demonstrated that TRIOBP is an actin binding and actin bundling protein. Interestingly, TRIOBP is only found around the rootlet (which serves as an anchor) of stereocilia of which the main components are actin filaments. If this protein is deleted or mutated, it causes deafness. TRIOBP might be stabilizing the rootlet of actin bundles, like the roots of a tree. Structure, function, and stiffness of this protein are unknown. Sakamoto is now investigating the stiffness and the structure of actin bundles with TRIOBP by using his single molecule techniques.

Dr. Jian Huang joined our Department as an assistant professor in the fall of 2010. He received his Ph.D. in Physics from Michigan State University on the transport properties of mesoscopic systems. After a short postdoctoral stint at NIST in Boulder, Colorado, he joined Princeton University, as a research associate, studying the strongly correlated low-dimensional electron systems. Prior to coming to Wayne State, he also worked for three years as a teaching professor at Taylor University in Indiana.

Huang's research in strongly correlated two-dimensional (2D) systems aims at understanding the electron-electron interaction effect and the electron-disorder interaction at low temperatures. By developing ultra-dilute two-dimensional electron systems and performing transport measurement, he has studied both metallic and insulating behaviors of



Jian Huang

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Wayne State University Board of Governors

Richard Bernstein, chair; Tina Abbott, vice chair; Debbie Dingell, Eugene Driker, Diane L. Dunaskiss, Paul E. Massaron, Annetta Miller, Gary S. Pollard,
Physics Department Chair: Ratna Naik;
Newsletter Editor: Jogindra M. Wadehra



Letter from the Department Chair



Dear Friends and Alumni of the Department,

Innovation has been the overwhelming theme during the past two years in the Department of Physics and Astronomy, as we introduced a new BA Astronomy degree program, upgraded our Planetarium from an optical-mechanical starball to a state-of-the-art digital projection system, and established an Office of Outreach.

In May 2010, the Wayne State University Board of Governors unanimously approved our new B.A. Astronomy degree program – a program unique in the state of Michigan. This exciting program combines physics and astronomy courses with an emphasis on astronomy. The program officially

began in the Fall 2010 semester with a newly developed course on astronomical techniques.

In January of the year just past, our Planetarium was upgraded to a Spitz SciDome HD digital projection system. This new system greatly improves our ability to present current night sky and astronomical science to our visitors, gives us the ability to fully automate and create planetarium shows, and the capability to present full-dome films.

With the creation of our new Office of Outreach we are addressing the need for continued scientific literacy in our community. Paired with our Planetarium effort, our combined Planetarium and Outreach group is a strong force within our department, on campus, and in the community. With our new digital system and renewed focus on *outreach*, we have increased visitation to our planetarium by over 100% and are actively promoting our Physics and Astronomy programs on and off campus.

Our Biomedical Physics program (BMP) introduced in 2008 has been highly successful, and as a result, our enrollment continues to climb. We have graduated our first nineteen BMP majors and many of them have gone on to medical school, graduate school in biomedical engineering, graduate school in physics, and private industry. Our innovative

programs are preparing students for the jobs of the future!

And in March of this past year, the largest particle accelerator ever built, the LHC (Large Hadron Collider), achieved record-collision energies at CERN in Geneva, Switzerland. Our high energy nuclear and particle physics faculty were there to support and witness this exciting moment in history.

We continue to be an international leader in research and technology, and through our service to the community, we are providing educational outreach programs which reinforce our commitment to physics and astronomy education.

Your generous support provides scholarships to undergraduate and graduate physics and astronomy students, funding for our outreach programs and planetarium, cultural exchanges, and faculty/staff awards, as well as research support for our department.

We thank you for your continued support and ask that you consider contributing to one of our departmental gift funds. To make a contribution, details can be found in this newsletter or by visiting <http://www.clas.wayne.edu/clasaa/> ■

Regards,
Ratna Naik

New Members *Continued from page 1*

the intriguing 2D metal-to-insulator transition (MIT) which is potentially an indication of quantum phase transition.

Huang's current research focus at Wayne State includes three areas. The first is to study the interaction-driven electron phase transition in very strongly correlated two-dimensional and one-dimensional electron systems in semiconductors. The second area is to develop a nanofabrication process of creating quantum devices

such as quantum wires and dots from a novel type of GaAs field-effect-transistor and study transport properties associated with the spin ordering. The third area is to utilize the recently established fabrication method of creating a large suspended graphene system and perform measurement in the limit of dilute electrons within the graphene sheet. ■

The New Bachelor of Arts Degree in Astronomy

The Wayne State University Board of Governors unanimously approved the new Bachelor of Arts degree program in Astronomy in May 2010. The official start of this new program was the Fall 2010 semester.

Physics & Astronomy Matters talked with Professor Paul Karchin, Chair of the B.A. Astronomy Committee, about this new and dynamic program.

When did talk of a B.A. Astronomy degree program first surface?

The decision to seriously pursue an undergraduate astronomy program was made in the spring of 2008. Physics and Astronomy Chair, Professor Ratna Naik, appointed a committee consisting of myself as Chair, Professors David Cinabro, Claude Pruneau, and Steven Rehse, and Senior Lecturer Jeffrey Conn.

As you were the one to write the proposal for the B.A. Astronomy degree, were you the main force behind developing this new program?

It was my idea that the first astronomy degree program in our department should be a B.A. I came to Wayne State University in 1995 and found lots of interest in astronomy education and research here, but it was unclear how to expand our academic program in astronomy. B.A. programs are a tradition in astronomy and many famous astronomers have started that way. In the B.A. program graduates have broad options for jobs or graduate degrees.

Some of the faculty who have been active in astronomy education and research in our department are Professor Emeritus Gerald Dunifer and Professor David Cinabro (research), Senior Lecturer Jeffrey Conn and Professor Claude Pruneau (planetarium), and former Assistant Professor of Research Jim Johnson and Professor David Cinabro (roof-top telescopes).

Is there a demand or a need in society for a program such as the B.A. Astronomy program?

There is a great demand for scientifically educated college graduates in government, education, law, and industry, and these graduates must be familiar with the pre-eminent scientific activities of our time, many of which are in the field of astronomy. The quest to understand the nature of dark matter and dark energy are likely to have immense consequences for the technological world of the future. The state of astronomy in 2010 is something like the state of physics in 1910: great mysteries have been uncovered, and the explanations are just starting to emerge.

This is a propitious time for change. The discovery of the “dark side” of the universe has fired up public interest in astronomy. Simply put, most of the energy and matter in the universe cannot be explained by the known laws of physics. This has created a large

student demand for astronomy education.

What sets the B.A. Astronomy program at WSU apart from other Astronomy degree programs?

Surprisingly, no other colleges and universities in Michigan offer a B.A. astronomy program, even though such programs are common nationwide. Michigan State University and the University of Michigan – Ann Arbor offer a B.S. in astronomy, and Eastern Michigan University offers a B.S. in physics with a minor in astronomy. Thus, a B.A. Astronomy program at WSU will be unique in Michigan and could be a significant factor for some students to choose Wayne State for their undergraduate education.

Students graduating with a B.A. in astronomy have a wide range of career options including entry-level jobs as well as graduate education in law, business, education, social and physical sciences. In short, these students will have all the traditional options of liberal arts majors with the added advantage of a unique science background.

What other attributes does Wayne State have that makes this new program very attractive to undergraduates?

We have a well-established planetarium and roof-top observatory and a large number of faculty members who have taught introductory astronomy, solar astronomy, or who conduct research in astronomy or the closely related fields of nuclear and particle physics. The K-12 NASA/SEMAA (Science Engineering Mathematics Aerospace Academy) is a long established program at Wayne State and could provide excellent outreach and educational activities for B.A. astronomy students.

Can you tell us about the program and the core courses surrounding the BA Astronomy degree?

The B.A. Astronomy program is intended to provide students with foundational knowledge in astronomy and space science. Students will graduate with strong scientific preparation and communication skills. Five courses (including one laboratory-based course), at the 4000 or 5000 level, form the core of the astronomy major curriculum. Four of these courses are new and will be developed and initially taught by current faculty members.

Undergraduate Advisor of the B.A. Astronomy program, Professor David Cinabro, has developed and is currently teaching, a new Astronomical Techniques course and laboratory to B.A. Astronomy students. What are his students learning?

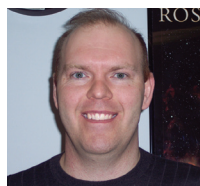
The course introduces students to the techniques of doing astrophysics. Professor Cinabro starts with an introduction to the detectors used in astronomy for optical and infrared photons, radio and microwaves, X-ray and gamma-rays, and neutrinos.

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Awards and Honors



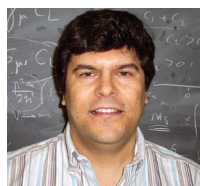
Boris Nadgorny



Gavin Lawes



Paul Karchin



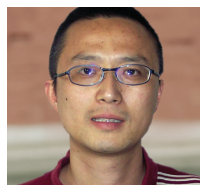
Alexey Petrov



Peter Hoffmann



Sean Gavin



Zhixian Zhou

During the last two years, two of our faculty members received a Career Development Chair Award. These awards, supported by the university, are provided to tenured faculty members in the early stages of their careers. Significant unrestricted financial support provided by these awards is used to fund research activities as well as to cover a portion of the chairholder's teaching duties. **Boris Nadgorny** was the recipient of the Career Development Chair Award during 2009 and **Gavin Lawes** received the Award in 2010.

The Board of Governors of Wayne State University has established an annual Board of Governors Faculty Recognition Award to be given each year to regular full-time faculty in recognition of a particular accomplishment or achievement during the previous academic year. **Paul Karchin** and **Alexey Petrov** received the 2010 BOG Award for organizing and co-chairing the 2009 Meeting of the Division of Particles and Fields of the American Physical Society (APS-DPF-2009) held on the Wayne State campus from July 26 to July 31, 2009. This conference is the largest national meeting of the US high-energy physics community.

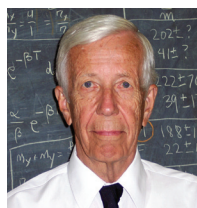
The President's Award for Excellence in Teaching is presented annually by Wayne State University to outstanding faculty who, to an exceptionally high degree, demonstrate comprehensive knowledge of their subject, superior classroom performance, and high educational standards. **Peter Hoffmann** and **Sean Gavin** were the recipients of this prestigious award in 2009 and in 2010, respectively.

Every year the College of Liberal Arts and Sciences (CLAS) supports the excellent teaching by providing a few teaching awards to faculty members who show effective and innovative teaching methods at the undergraduate and graduate levels. In our Department **Zhi-Feng Huang** was the recipient of the 2009 CLAS teaching award and **Zhixian Zhou** and **Paul Karchin** were the recipients of the 2010 CLAS teaching awards.

The Richard J. Barber Faculty/Staff Award of the Department of Physics and Astronomy



Claude Pruneau



Melbourne Stewart



Henry Bohm

honors faculty or staff members whose efforts have elevated the stature of and have brought external recognition to our Department. Recent recipients of this Award are **Claude Pruneau** (2009), **Paul Karchin** (2010), **Alexey Petrov** (2010), **Henry Bohm** (2010) and **Melbourne Stewart** (2010). Pruneau received this award for providing leadership in creating the first-ever online section of our descriptive astronomy course, which resulted in almost doubling the enrollment in that course. Karchin and Petrov received the joint award for organizing the APS-DPF-2009 meeting mentioned previously. In addition, Emeritus Professors Bohm and Stewart jointly received the award in recognition of their lifetime achievements and their continued selfless service to the Department of Physics and Astronomy.

As a tradition, our department has been giving awards to graduate teaching assistants who show outstanding efforts in providing a high level of teaching in undergraduate introductory physics laboratories. The recent recipients of the Daniel R. Gustafson Award have been **Christopher Healey** (2009) and

Indermeet Kohli (2010). The AAPT Award includes the usual monetary grant as well as a subscription to the *American Journal of Physics*. The recent recipients of this award are **Joseph Klesko** (2009) and **Vera Loggins** (2010).

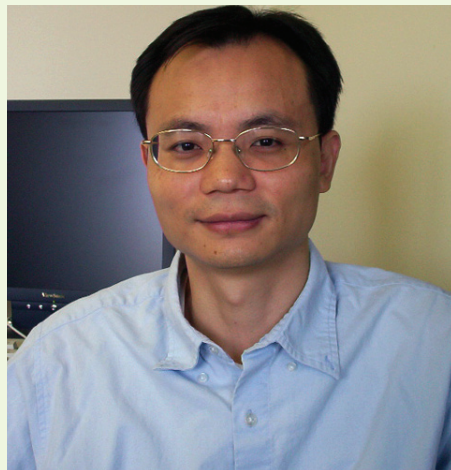
In March 2010, the Graduate School hosted the Graduate Exhibition Day, an event to celebrate Wayne State's graduate community and their essential and exciting research and scholarship. The award for one of the best posters at this event was presented to our graduate student **Shah Khan**.

The academic achievements and excellence of undergraduate physics majors is recognized by the Vaden Miles Award in our Department. The recent beneficiaries of this award have been **Michael Catanzaro** (2009), **Emmett Windisch** (2009) and **Omaira Bokhari** (2010).

For the last several years, the Department of Physics and Astronomy has been annually awarding scholarships to full-time undergraduate physics majors to ensure that the high quality and caliber of undergraduate education is maintained. The recent recipients of these scholarships have been **Erin Nagelkirk** (2008-09) and **Omaira Bokhari** (2008-09).

Finally, our undergraduate BioMedical Physics (BMP) program has been growing in enrollment since its beginning a few years ago. Using the Richard Barber Gift Fund, scholarships were presented to eight BMP majors in 2008-09 and ten majors in 2009-10. ■

Huang Receives NSF-CAREER Award



Dr. Zhi-Feng Huang has received a CAREER award from the National Science Foundation (NSF), which is the most prestigious award in support of the early career-development activities of those teacher-scholars who most effectively integrate research and education. This is a five-year award, starting in 2009, in support of Dr. Huang's theoretical study on nonequilibrium nanostructured systems. His research will be coordinated with educational activities for undergraduate and

graduate students as well as for current and future K-12 science teachers in the Detroit area. Including Dr. Huang, we now have six CAREER awardees on our faculty roster.

Dr. Huang's research supported by this award addresses a fundamental challenge of understanding the physics mechanisms behind the growth and processing of both solid and soft complex materials, in particular the fascinating and puzzling out-of-equilibrium process in which the materials organize themselves (self-assemble) into structures or patterns that are of nanoscopic length scales. This also involves a technologically important area of nanofabrication, mainly for potential applications in high-performance novel devices with embedded nanostructures such as quantum dots or nanowires. Dr. Huang is working on two of the most promising systems of nanostructure growth: strained thin film epitaxy for semiconductor materials as well as block copolymer film self-assembly used in soft-template nanolithography. To investigate such complex, nonequilibrium phenomena through a combination of theoretical

modeling, analysis, and simulations, Dr. Huang is developing more efficient multiple-scale approaches across different levels of description, including microscopic details, mesoscopic or nanoscale profiles, and continuum or hydrodynamic behavior for large-scale structures. Such study is expected to not only maintain the efficiency advantage of traditional continuum methodology, but also incorporate new significant effects due to details of material structures.

Another component of this award is to support an educational outreach project led by Dr. Huang to promote K-12 science education in the Detroit area serving underrepresented minority students. Dr. Huang has been working with a science teacher at Detroit International Academy (an all-girl minority high school) and a Wayne State undergraduate who is in the pre-service science teacher program. This project emphasizes the professional development of both in-service and pre-service science teachers, and more importantly enhances the K-12 science education for minority high school students. ■

Bachelor of Arts *Continued from page 3*

And his students review techniques used in imaging, photometry, spectroscopy, astrometry, polarimetry, and for analyzing public data available on the web.

In the laboratory course students focus on optical astrometry. Students learn to measure the quantum efficiency of a CCD based astronomical digital camera; measure the through-put as a function of wavelength of a set of standard astronomical filters; measure the HR diagram of a star cluster using the calibrated camera and filters with the telescopes mounted on the roof of the physics building; and calibrate the response of a spectrometer and use the spectrometer to measure the spectra and observe spectral features of a bright star.

What type of student will be attracted to this new program?

Astronomy will attract a broad spectrum of students who may otherwise have majored in many other subjects. The mix of subjects offered by our program encompasses planetary geology, the solar

system, space exploration, telescopes, stars, galaxies and cosmology, and is perfect for the B.A. program. And our program is not as mathematics intensive as a traditional degree in physics. We believe that these aspects of our astronomy program will make it quite attractive to students.

What are your hopes for the future of the B.A. Astronomy program?

I share with many colleagues in our department the hope that the B.A. program is the start of an expanding academic and research program in astronomy in our department. Future possibilities include a graduate program and new faculty appointments with research concentrations in astronomy.

Professor Karchin, do you have any other comments?

One hope has definitely been realized - we are now truly the Department of *Physics and Astronomy*. ■

Kauppila and Rolnick Retire



Walter Kauppila

After thirty-eight years as a most dedicated, effective, and highly appreciated member of our department's faculty, Professor Walter Kauppila retired in May, 2010 and is now an Emeritus Professor. Former graduate students, research associates, and colleagues gathered together on June 15, 2010 with Walt

and his wife, Margaret, to celebrate this milestone at the WSU Planetarium, where "Stars of the Pharaohs," one of Walt's favorite digital planetarium movies, was shown. This was followed by lunch together at Xochimilco, a favorite restaurant of the WSU positron scattering research group.

After receiving his Ph.D. from the University of Pittsburgh and working as a postdoctoral fellow at JILA (the Joint Institute for Laboratory Astrophysics) in Boulder, Colorado, Walt came to WSU in 1972 and began a thirty-one-year-long research partnership in experimental atomic physics with Bert Stein (Emeritus Professor, retired in 2004), working with students and research associates to set up a low energy positron beam that they then used to study positron-atom/molecule collisions, research that was supported by the National Science Foundation over a period of 30 years. Walt is a Fellow of the American Physical Society, a member of the WSU Academy of Scholars, a recipient of the WSU Board of Governors Award, the Wayne State University President's Award for Excellence in Teaching, and a Wayne State University College of Science Excellence in Teaching Award.

In his retirement, Walt has been continuing some activities that he was involved in prior to retiring. These include using the positron scattering lab to set up a system for studying ionization of biomolecules by positron impact. Walt also continues to be involved in outreach activities by giving "Phantastic Physics Phenomena" demos to various groups visiting WSU. Outside of WSU, some of Walt's major interests are family (with both of his sons and three grandchildren living in the Chicago area), photography (examples can be seen on his Flickr site by googling "Walt K"), traveling/hiking

(particularly in the U.S. southwest), and singing/performing in the Rochester Heart of the Hills Barbershop Chorus.

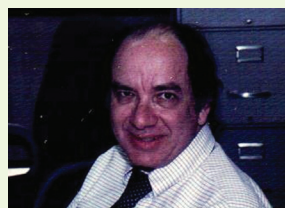
Professor William Rolnick retired at the end of the Winter 2010 semester after serving Wayne State University for forty-four years. Bill joined our Department as an Assistant Professor in 1966 after earning his Ph.D. from Columbia University in New York, followed by a two-year postdoctoral appointment at Case Western Reserve University in Cleveland. He was promoted to Full Professor in 1981.

During his career Professor Rolnick spent time doing research, teaching physics courses, and writing books. He has been one of the outstanding faculty members of the Department of Physics and Astronomy whose teaching has ranged from undergraduate introductory to advanced graduate level courses. He is perceived as a demanding, insightful and caring instructor by his students at all levels. Bill has received the College of Science Teaching Award in 1996 and the prestigious President's Award for Excellence in Teaching in 1999.

In the early part of his career Professor Rolnick did very important research in the challenging area of theoretical particle physics. Later on he turned his attention towards book authorship. In 1994 he published *The Fundamental Particles and Their Interactions*, which is being used as a textbook in various physics departments across the nation. In 2003, Bill wrote *Remnants of the Fall - Revelations of Particle Secrets*, for which he received the Board of Governors Faculty Recognition Award of Wayne State University. This popular book has been highly praised by reviewers and was nominated for the Pulitzer Prize.

Professor Rolnick is an accomplished singer and during his retirement he intends to continue his musical avocation. In addition, he plans to continue to write physics books with general appeal. We will continue to benefit from the experience and wisdom of Professor Rolnick as he assumes his new role as Emeritus Professor of Physics.

We wish Walt and Bill good health and lots of joy in their retirement! ■



William Rolnick

Planetarium & Outreach - A New Force in Physics & Astronomy

In the Beginning, there was Spitz

In the 1900s, a man named Armand Spitz had a vision of bringing space science to school children and the general public. Spitz created a 4-foot tall moon out of papier-mâché that he took to schools to teach children about the Moon and astronomy. His subsequent creation of the model A, a portable planetarium, revolutionized and popularized astronomy and so began a new era of outreach.

Spitz influenced us at Wayne State, too. Wayne State set up its first planetarium in the 1950s with the Spitz model A-1. Rumor has it that Spitz's friend, Albert Einstein, suggested the design for the model A-1: a pentagonal dodecahedron. You can still see this antique when visiting our planetarium.

Fast forward to the year 1996. We upgraded to a Spitz starball. "S512," as we fondly called this model, projected the most exquisite

Continued on page 7

Planetarium & Outreach *Continued from page 6*

points of light - representing stars - on our dome. But all things change, and earlier this year we said good-bye to our starball and hello to a SciDome HD digital projection system. Following in Spitz's footsteps, we combined our efforts and the planetarium and outreach team was born.

The Planetarium as an Outreach Tool

The planetarium is a wonderful venue for outreach; not an entity in itself, but one to attract and inspire students, and to educate and awe the general public. And we have done just that! Since installing our new system, we have seen our planetarium visitation increase over 100%. With our Friday evening public shows, visits from K-12 schools and special interest groups (cub scouts, senior citizens, etc.), inclusion of mandatory planetarium shows in our Physics & Astronomy course curricula, and shows for SEMAA (Science, Engineering, Mathematics, and Aerospace Academy), we have been extremely busy!

With our new digital system, we have so much more to offer: Starry Night Dome planetarium software, ATM-4 automation software, the Spitz Fulldome Space Library, fulldome curriculum support, and teacher resources. As part of our package, we purchased seven fulldome movies, and with a generous contribution from Professor Emeritus of Physics, Gerald Dunifer, we purchased an eighth film, the popular *Black Holes* movie narrated by actor Liam Neeson. The automation software and extensive library that is part of this new system enables us to create our own fulldome presentations. With this creative edge, we can target specific audiences with tailor-made shows.

Since the installation of our new system we have jumped into action to promote the academic programs of the Department of Physics and Astronomy by increasing our visibility on and off campus. And we are honoring our commitment to educational outreach by bringing science education to K-12 schools and the general public.

Office of Outreach

We are accomplishing our goals with our newly created Office of Outreach. The planetarium and outreach team composed of Jeffrey Conn, Pat Domanski, Paul Drallos, Professor Emeritus Gerry Dunifer, Professor Emeritus Walt Kauppila, and Dawn Niedermiller is developing a strong and exciting outreach program under the guidance and leadership of newly appointed director Professor Claude Pruneau.

Our combined planetarium and outreach effort was the vision of Physics and Astronomy Chair Professor Ratna Naik. "The planetarium is our *springboard*. We have this wonderful facility and we are expanding our programs outward to engage our visitors in physics and space science, geology, and chemistry," says Naik.

Our K-12 programs have become very popular as we offer not only planetarium shows but our *Phantastic Physics Phenomena* demonstrations and hands-on geology activities (in cooperation with the Department of Geology and Environmental Science). We have participated in Science Days with the Department of Chemistry.

We are crossing boundaries and collaborating with other science departments to grow our programs.

Outreach continues within the WSU community as our Outreach Staff attend on-campus events and visit classrooms to talk about our Physics and Astronomy academic programs. Off campus, our staff is present at educational conferences, and makes special presentations at area high schools and Math & Science Centers.

Our Marketing Campaign

Promotion is the key to getting the word out and we have embarked on a fast-paced marketing campaign. We have installed interior and exterior planetarium signage and three beautiful wall murals outside our planetarium doors. No longer will visitors have problems finding our planetarium! Our marketing continues via the web with EBLASTs (mass emails) and the WSU Events Calendar, and a soon to be unveiled new planetarium website; through newly designed brochures and posters, and through the diligent efforts of our faculty and outreach staff.

Our Future

We have so much in store! Summer 2011, say hello to *Camp Cosmos* - our first Physics and Astronomy summer camp for children ages 12-16. The curriculum for *Camp Cosmos* proves to be exciting and challenging, as students will have the opportunity to learn our planetarium software, Starry Night, and create their own planetarium shows. And, we are starting a series of science lectures for the general public and WSU community aptly titled "Science Under the Dome," as the planetarium will be our venue as we host stimulating science talks by professional scientists.

We have a wish list, too! We hope to acquire a dedicated activity room that will be used solely for our visiting groups and where we can conduct our hands-on science activities and host our *Phantastic Physics Phenomena* demonstrations.

With our eyes turned to the greater Detroit area, we plan to develop Saturday programs for children and hope to purchase additional fulldome films especially for kindergarten through 4th graders. With growth comes the need for additional staff and maintenance to our planetarium theater. We are currently recruiting planetarium presenters and hope to obtain funding to remodel the inside of our planetarium. We are also in the process of creating our own planetarium shows and creating new hands-on science activities.

Visit the Wayne State University Planetarium

Have you visited the WSU Planetarium? Go to <http://planetarium.wayne.edu/> and check out our public show calendar. You will find our Friday evening public show schedule and our Science Under the Dome events.

Would you like to plan a special event or bring your club or scouting group to our planetarium? Contact us and together we can help you plan your special visit.

Pass the word! Tell your friends and family about <http://planetarium.wayne.edu/> or call our Office of Outreach: 313-577-2107. ■

Wayne State and the Large Hadron Collider

On March 30, the largest particle accelerator ever built, the Large Hadron Collider (LHC), achieved record-collision energies when the combined energy of two proton beams reached 7 TeV. This is only “half” our targeted energy and the goal is to eventually reach the LHC’s design energy of 14 TeV!

The LHC was, in large part, built and designed to establish the existence of a particle named the Higgs boson. Theory predicts the Higgs boson and discovery of the Higgs may help to explain the rise of mass in the universe. The LHC will also permit, with the acceleration of heavy nuclear beams of lead, the study of primordial matter - the matter that existed for a period of one micro-second immediately after the Big Bang.

The LHC is the premier accelerator in the world and is a technological wonder. Having our Wayne State faculty and students participate in this endeavor brings great prestige to our university and plenty of opportunities for our students to get advanced degrees in science.

At Wayne State, there are two groups involved in research at the LHC:

The first group to join the LHC is the Nuclear Physics Group composed of Professors Thomas Cormier, Sergei Voloshin, Claude Pruneau and Adjunct Rene Bellwied. We also have post-doctoral researchers and graduate students involved in this effort.

Our goal is to study the properties of matter produced in lead-on-lead nuclear collisions - which is expected to happen in 2011. The temperatures reached in these collisions will produce elementary constituents of matter called quarks and gluons. Quarks and gluons are the stuff that permeated the universe right after the Big Bang. Our group joined the ALICE (A Large Ion Collider Experiment) collaboration over six years ago for this single purpose. Our contribution was construction (onsite in our Physics building) of a large detector called EMCal. EMCal is an electromagnetic calorimeter designed to make precise measurements of the energy

of particles produced in nuclear collisions. The ALICE experiment provides opportunities for our students and post-doctoral researchers to become specialists in detector and accelerator technologies, sophisticated data analysis techniques, and to discover new physics.

The second group to join the LHC from our department consists of Professors Robert Harr, Paul Karchin, Mark Mattson, Caroline Milstene, and a group of postdocs and graduate students. This group is involved in the CMS (Compact Muon Solenoid) experiment. The primary goal of the CMS collaboration - i.e. the reason they designed and built this gigantic detector - is to search for the Higgs boson. The Higgs boson is required in the framework of the Standard Model of Particle Physics to explain why all particles, and everything around us - including ourselves - have mass. Discovering this new particle is one of the most important goals of the CMS experiment. The CMS experiment has many other goals including the search for dark matter - the stuff that makes up 25% of matter in our Universe. As for the ALICE experiment, Wayne State students involved in the CMS experiment will learn about new technologies, new physics, and hopefully discover the Higgs boson or the nature of Dark Matter.

The beginning of data collection at 7 TeV is great news for the particle theory community as well. The WSU particle theory effort is led by Professor Alexey Petrov, Dr. Andrew Blechman, and four graduate students. Many theoretical models have been developed in the past several years to explain the patterns of elementary particles’ masses and interactions. Many proposed models have a “cosmic connection,” as they contain new particles that can play a role of “dark matter.” Wayne State’s particle theory group is working on a variety of models that can be tested, not only at the LHC, but also in other, low-energy and astrophysical experiments. They eagerly expect the arrival of new data that can be used to pinpoint the correct description of physics right after the Big Bang. ■

Dr. William H. Weihofen’s Generous Gift

The 2008 edition of *Physics and Astronomy Matters* published a letter received from Dr. William H. Weihofen, Wayne State University alumnus (Ph.D. 1969). In his letter, Dr. Weihofen expressed his appreciation for the experiences and the interactions he had with Physics faculty and students during his academic career. In

honor of his thesis advisor, Distinguished Professor Emeritus Suraj N. Gupta, Dr. Weihofen made a generous, unrestricted gift to the Department of Physics and Astronomy.

Dr. Weihofen’s generous gift continues to provide financial support to the Department of Physics and Astronomy through

educational scholarships, research funding, and faculty/staff projects.

In the words of Dr. Weihofen, “Wayne State occupies a significant place in my fond memories; it deserves my support.” We thank you for your generous support! ■

Biomedical Physics Program Grows by Leaps and Bounds

We first introduced the Biomedical Physics program (BMP) in 2008 and our hopes were high. Biotechnology (bioengineering, biophysics, biochemistry, etc.) is a growing industry and a highly-skilled, scientifically-literate workforce is needed to fill these jobs of the future. BMP has answered the call and in just two years nineteen students have graduated from our program (with more than fifty currently enrolled).

Five of our nineteen graduates are currently in the graduate BME program (Biomedical Engineering) through our cross-disciplinary, cross-departmental accelerated Masters program - the first of its kind at Wayne State University. "We have a special relationship with the Biomedical Engineering department in the College of Engineering and BMP students can elect to complete a Masters degree in BME in 4+1 years through

our unique AGRADE program," says BMP Director and Associate Professor Dr. Peter Hoffmann.

As a matter of fact, the word is out. "We are finding that BMP undergraduates do exceptionally well in graduate BME courses due to rigorous preparation in the undergraduate BMP program," according to Hoffmann. "Not only rigorous academics, but research experience gives our students an edge when applying for medical school and seeking jobs in private industry. The majority of our BMP students elect the 'honors' track and many students participate - actually do independent research - in nanoscience, chemistry, biology, microbiology, medical physics, biochemistry, neuroscience, and engineering."

With so much competition to enter medical school, BMP has proven itself once again. Hoffmann goes on to say that

"seven of our recent BMP graduates have been accepted into medical school. This is over a 30% acceptance rate - much higher than the national average. And the rest of our recent BMP graduates have found jobs in private industry, have entered graduate school in physics or BME, and a number of students are interning as Medical Assistants while applying for the Physician's Assistant program."

With the success of the BMP program, where do we go from here? To address the need for increased proficiency in mathematics and computer applications, Dr. Hoffmann is developing a Computational Physics course that will join the other required courses of the BMP curriculum. According to Hoffmann, "This course will train students in using computers to solve complex problems in physics and mathematical biology." ■

The George B. & Eveline R. Beard Endowed Student Prize



Professor Naik and Glenn Beard present student prizes

The George B. & Eveline R. Beard Endowed Student Prize was created through the combined generosity of loving sons Dr. Kevin B. Beard, William B. Beard, Glenn B. Beard, Randall B. Beard, and Keith McDonald, widower of Dr. Beard's only daughter Lisa, as well as colleagues of the late Dr. George B. Beard and Eveline R. Beard.

Dr. Beard came to Wayne State University in 1960, where he remained as a member of the Physics Department until his death in 2007. Dr. Beard served as Chair of the Physics Department, Chair of the Computer Science Department and Associate Dean. Mrs. Eveline R. Beard (formerly Eveline Roehling) earned B.S. and M.S. degrees from Wayne State University. Mrs. Beard actively participated in departmental functions in the Physics Department.

Since 2008, through the generosity of the Beard Endowed Student Prize, the Department of Physics and Astronomy has held a yearly Undergraduate Physics Conference. Undergraduate students from Wayne State University and other colleges and universities may enter posters of their physics and astronomy research and be eligible to win cash awards.

The one person we can always count on to be there to represent his family's legacy and to show support for physics and astronomy is Glenn B. Beard. Glenn Beard resides in Michigan and has been present at our Undergraduate Research Conferences since 2008 to present the awards for the best student posters.

Earlier this year the first Graduate Physics Conference was held. Glenn Beard was present to continue his tradition of awarding student prizes. The generosity of the George B. & Eveline R. Beard Endowed Student Prize has made these events possible. ■

Generous Gifts from Richard J. Barber

The College of Liberal Arts and Sciences has received many generous gifts from Richard J. Barber, Esq., alumnus of Wayne State University. The Richard J. Barber Fund for Interdisciplinary Research continues to support research and collaboration between the Departments of Physics, Biology, Electrical and Computer Engineering, and the College of Pharmacy. In addition, the generosity of the Richard Barber Fund is used to provide annual scholarships to undergraduate biomedical physics majors.

Prior gifts established the Richard J. Barber Fund for Interdisciplinary Research and the Richard J. Barber Faculty/Staff Recognition Award. The endowments are structured to advance research in the areas of materials properties and nanotechnology, and to investigate biomedical applications. The faculty/staff award honors outstanding achievement by a faculty or staff member in the Department of Physics whose accomplishments have significantly impacted research efforts, or whose efforts have elevated the stature of the department.

Following are the most recent projects supported by the Richard J. Barber Fund for Interdisciplinary Research:

(2008) Cell mechanics: Interface between Cell Biology and Biophysics; Karen A. Beningo (Biology) and Peter Hoffmann (Physics) (2008) Raman Spectroscopy on Wag31 Proteins; Choong-Min Kang (Biology) and Steven J. Rehse (Physics) (2010) Raman Spectroscopy Study of the Protein Complex Proteasome; Choong-Min Kang (Biology) and Steven J. Rehse (Physics) (2010) Novel Nanomaterials for High-Performance Lithium Batteries; Mark Cheng (Electrical and Computer Engineering), Zhixian Zhou (Physics), Sudakar Chandran (Physics) (2010) Iron Oxide Magnetic Nanoparticles for DNA Binding and Hyperthermia-Enhanced Transfection; David Oupicky (College of Pharmacy) and Gavin Lawes (Physics)

Our department and its faculty and students greatly appreciate the support provided by the Richard J. Barber Fund. ■

Cultural Exchange Continues Through the Generosity of Warchol Family

Through the continued generosity of Mr. Frank Warchol and Mrs. Jane Warchol, the cultural exchange program that was established in 2006 continues today.

In 2006, a generous gift from the Warchol family established a cultural exchange program that gave two WSU students the chance of a lifetime - the opportunity to experience France and participate in research with Dr. R. Suryanarayanan at the Université Paris-Sud at Orsay.

The cultural exchange program continued during December/January 2008-2009, when two WSU graduate students traveled to India to visit the Indian Institute of Science in Bangalore and the Indian Institute of Technology Madras in Chennai, India. The host of this exchange was Professor M.S. Ramachandran Rao (IIT Madras).

Professor Gavin Lawes, WSU Assistant Professor of Physics, accompanied WSU students during the 2006 and 2008-2009 cultural exchanges.

This year, the cultural exchange continues

as Assistant Professor of Physics Dr. Takeshi Sakamoto is accompanying students from December 2010 through mid-January 2011. Their destination is Chennai, India, where they will spend time working on a collaborative research project in biomedical physics with Professors Ramachandra Rao and Sudakar Chandran at the Indian Institute of Technology Madras (IITM), and with Professor Kavitha Thirumurugan at the Vellore Institute of Technology (VIT) in Vellore, a historic city located 140 km from Chennai.

The research initiative at Wayne State is being guided by Dr. Takeshi Sakamoto, who joined our faculty in 2009. Using single molecule techniques, Dr. Sakamoto, his students, and collaborators in India will investigate the mechanisms of a new protein molecule, termed TRIOBP. This innovative project will investigate in detail the biochemical and biophysical aspects of the interaction of TRIOBP with actin filament.

Another research project will center on

the investigation of magnetic nanoparticles for biomedical applications, including magnetic resonance imaging contrast agents, drug targeting, and cancer treatment using hyperthermia. Both the Wayne State University and IITM groups have extensive experience working with magnetic nanoparticles, and students participating in the exchange will have the opportunity to learn the different specialties in each group.

The summers of 2011 and 2012, students from VIT and IITM will visit Detroit to conduct research at Wayne State University, as well as have the opportunity to interact with American students.

In addition to research experience, American students will have the opportunity to experience a different culture, and gain honest insights about Indian culture and society that they will share with their classmates, friends and families. We appreciate and thank the Warchols for their generosity. ■

The Levys – Friends of Physics and Astronomy



Dr. Stan & Mrs. Rita Levy

Vibrant, Dynamic, Spirited. These are just a few words that describe Dr. Stan and Mrs. Rita Levy - philanthropists and octogenarians so full of life, they put those less than half their age to shame. Dr. Levy, a dedicated internist, continues to practice medicine heeding the call of his patients, "You must not retire." Mrs. Levy, a former aviator, sailor, and entrepreneur does not show signs of slowing down as she flashes a lovely smile and talks about one of the many organizations she and husband Stan support.

Our relationship with the Levys began in 2008 when Jack Lessenberry, WSU Professor of Journalism, Senior Political Analyst for Michigan Radio, and close friend of the Levys, told them about an upcoming visit by Nobel Laureate Dr. Eric Cornell. Annually, the Department of Physics and Astronomy hosts the Vaden-Miles Endowed lecture, which brings world-class researchers to the Wayne State University campus. That year Dr. Cornell was the guest lecturer. Dr. Cornell's research, involving an extreme state of matter called the Bose-Einstein Condensate, was of special interest to Stan Levy. The Levys wanted to meet Dr. Cornell and offered to host a special dinner at their

home in his honor. Physics faculty were invited and accepted the invitation.

This was the start of a beautiful relationship between the Levys and the Department of Physics and Astronomy. Stan and Rita have since become great supporters of the WSU Planetarium.

In the summer of 2009, the Levys graciously hosted a WSU Planetarium fundraiser. It was a beautiful afternoon and guests were free to wander through the Levy's home and garden. Stan Levy stood in his home welcoming guests as they entered. He wore a black Einstein t-shirt pulled tightly across his torso. We complimented Stan on his choice of shirt and he comically remarked, while pulling the t-shirt away from his belly, "More proof that the universe is expanding." The event was a success and the money raised greatly helped with the purchase of our new digital projection system.

Stan and Rita Levy are an eclectic couple with a comprehensive worldview. They support the arts and sciences, are passionate about the symphony, and are interested in people. As a matter of fact, Stan Levy has a great fascination for Albert Einstein - a fascination which began in the 1940s when Stan was a student at Princeton University. There, on more than one occasion, Stan had the good fortune to meet Albert Einstein. This started a lifelong interest in "all that is Einstein," according to Stan.

On the campus of Princeton in front of Borough Hall, there is a bronze bust of Einstein atop a tall, slender base. The bust sits in a park-like setting called EMC Square, reminiscent of Einstein's famous formula equating energy and mass. The bust was created and donated by American sculptor Robert Berks as part of a celebration of the 100th Anniversary of the publication of Einstein's most famous three papers - one of which was *The Special Theory of Relativity* - and the 50th Anniversary of Einstein's death. The year was 2005, the International

Year of Physics as proclaimed by the United Nations. The Levys were instrumental in the installation of this monument. The base on which the bust now sits was purchased through a generous contribution by the Levys to the Einstein Fund. The day that the bust was unveiled in 2005, Rita's daughter Shelley Mintz organized a spectacular three-day event which involved over sixty visitors and included activities in and around the Princeton area.

The Levys have a superb library that "reflects Stan's interest in history and his lifelong interest in Einstein," said Elizabeth Zerwekh, librarian and personal friend of Stan and Rita Levy. Books in the collection range from ancient manuscripts and literature to editions of famous science books. On a personal note, Elizabeth said, "I am one of many the Levys have adopted - including Physics and Astronomy Chair Professor Ratna Naik. The Levys are wonderful, generous and caring people."

What people, places, and events have shaped the lives of Stan and Rita Levy?

Two individuals greatly influenced Stan's decision to become a medical doctor: a surgeon named Dr. Frankenstein, and Stan's high school chemistry teacher.

As a youth, Stan saw a dog get hit by a car. "When I went to help the dog, the dog bit me," said Stan, shaking his head, "so then I had to go to the hospital. I was so fascinated by the surgery, I was invited by the doctor to become a junior orderly. The attending surgeon that day turned out to be Dr. Frankenstein, a third cousin of my father."

The other pivotal moment came in Stan's high school chemistry class. "Everyone took chemistry because the teacher was fantastic - he was a teacher we held in high esteem. One day the chemistry teacher looked at me and said, 'You are no scientist - go to medical school.'" The teacher had intuition, and on more than one occasion, assessed student's aptitudes and successfully gauged

Continued on page 12

Alumni Notes

James Klemic (B.S., 1987) has been working at the MITRE Corporation in the Washington DC area for the last three years. He writes "I am a scientist in the Nanosystems Group in MITRE's Emerging and Disruptive Technologies Division. I am an applied physicist actively engaged in research in nanoelectronics, forensics, micro/nanofabrication, chem-bio sensors, and robotics. I also direct and coordinate the laboratory research activities of about twelve fellow senior staff and about eighteen technical support staff, interns, and students."

Sultana Nahar (Ph.D. 1987) is working as a Senior Research Scientist in the Department of Astronomy of Ohio State University. She was recently elected as a Fellow of the American Physical Society. This year, in 2010, her book *Atomic Astrophysics and Spectroscopy* (in collaboration with Professor Pradhan of OSU) was published by Cambridge University Press.

Kenith Hogue (M.S. 1991) is working as a Clinical Medical Physicist at the University of Pennsylvania Medical Center in their Department of Radiation Oncology. He and his wife, Natalie, are proud parents of two young sons.

David Reid (Ph.D. 1995) has moved from Eastern Michigan University to the University of Chicago where he serves as the Executive Officer of the Department of Physics. He is also continuing to do research in theoretical atomic collision physics.

Ale Lukaszew (Ph.D. 1996) is currently an Associate Professor in the Departments of Applied Science and Physics at the College of William and Mary in Williamsburg, VA. Her research interests include investigations of thin films, nanostructures, and nanomagnetic nanostructures.

Grace Yong (Ph.D. 1997) writes, "Right now I am a post-doc at Towson University working on pulse laser deposition films of manganite perovskites with professors Dr. Vera Smolyaninova and Dr. Rajeswari Kolagani. I make the films and then make different kinds of measurements on them."

Eugene Surdutovich (Ph.D. 1998) is currently working as an

Assistant Professor in the physics department of Oakland University. His current research involves calculations of the efficiency of DNA damage in proton/ion-beam cancer therapy.

Daad Haddad (Ph.D. 2003) is working as a research scientist at the General Motors Global R&D Center in Warren, Michigan. Her current research involves synthesizing of tin nanowires for high power lithium ion batteries.

Upul Senaratne (Ph.D. 2005) is currently working as a Visiting Assistant Professor in the Department of Physics and Astronomy of University of Toledo.

Brian Robert (M.S. 2007), after graduating with a degree in experimental condensed matter physics, is now working at Toyota Technical Center in Ann Arbor, Michigan.

Ronald Tackett (Ph.D. 2009) is now an Assistant Professor of physics at Arkansas Tech University. He did his postdoctoral work at University of Texas in El Paso in experimental condensed matter physics prior to joining Arkansas Tech.

Parashu Kharel (Ph.D. 2009) is working as a postdoctoral Research Associate in Professor Sellmyer's group at the University of Nebraska-Lincoln. His research involves a broad range of topics in materials, magnetism and nanoscience.

Chris Grabowski (Ph.D. 2009) is now a postdoctoral fellow at the Liquid Crystal Institute at Kent State University in Ohio. He is working on the self-assembly of nanoparticles.

George Moschelli (Ph.D. 2010) is working as a postdoctoral Research Associate at the Institute for Theoretical Physics of the Goethe University in Frankfurt, Germany. He continues to work in the area of relativistic heavy ion physics.

Chandra Thapa (Ph.D. 2010) is currently working as an Assistant Professor of Physics at Kansas City Kansas Community College.

Shalhout Shalhout (Ph.D. 2010) is working on a search for the Higgs boson using data collected by the Collider Detector Facility at Fermilab. He is doing this research as a postdoctoral fellow with University of California at Davis. ■

Levys *Continued from page 11*

their interests and future paths. As predicted by the chemistry teacher, Stan Levy and other chemistry students went on to highly successful careers in medicine.

Rita's life has also taken many turns. Rita studied at WSU and eventually became a manager of a local news agency. But the entrepreneurial spirit ran high in Rita and she became a successful business woman, running a party planning business and later

an antique business. Before meeting Stan, Rita was an aviator flying Piper Cubs and Cessna 150s. Her inspiration to fly came from reading Isak Dinesen's memoir *Out of Africa*. Rita also sailed and was part of a crew that was always first class in their division during the Mackinac races.

The Levys' generosity has spanned many years and touched many lives. Among the many organizations they support is Orchards

Children's Services. Orchards provides foster care, healthcare, educational programs, and adoption services to help find loving homes for children who are no longer able to live with their birth parents. The organization was initially started by the National Council of Jewish Women. At the time thirteen children were in the program. Today the program helps over 4,000 children. ■

In Memory of Dr. William Beres

Dr. William P. Beres, Emeritus Professor of physics, died on February 19, 2009, in Israel. He was 73 years old.

Dr. Beres was known for his research in theoretical low-energy heavy ion physics. In collaboration with his graduate students and postdocs, he developed theoretical models to investigate nuclear reactions near astrophysical energies. His work, therefore, had a direct impact in astrophysics. Dr. Beres received his B.S. degree in 1959 and Ph.D. in 1964 from the Massachusetts Institute of Technology. He continued with a postdoctoral appointment at



University of Maryland and, in 1966, he was appointed as an Assistant Professor of physics at Duke University. He came to Wayne State University in 1969 as an Associate Professor and was promoted to Full Professor in 1975.

His students and colleagues remember Dr. Beres as an excellent classroom teacher

whose lectures were clear, lucid, and full of appropriate humor. In fact, Dr. Beres was known to have a special talent of making puns and playing with words belonging to physics jargon. In 1984, he was nominated for and received the prestigious President's Award for Excellence in Teaching from Wayne State University. From 1991 to 1998, Professor Beres served as the Associate Chair of our Department. He retired from the Department in 2003 and was appointed as an Emeritus Professor.

Even during his working years, Dr. Beres had indicated his desire and determination to go to Israel. As an elderly man with numerous medical conditions, he moved to Israel in 2005. It was a dream of his to see the country and live there. His wife had died in December of 2004, prior to his moving to Israel. He is survived by three children and eleven grandchildren.

Dr. Beres was a very gentle, kind, compassionate, and caring person. He helped everyone in every way he could. We will be missing him very much. ■

In Memory of Dr. Leonard Roellig

"Variety is the spice of life" was what Len Roellig often said. It was also his approach to life and the outlook he passed on to all who crossed his path. He loved watching waves breaking on the beach, or flames jumping from the log, because they were always changing and never the same. Driven by curiosity, the life of Leonard Oscar Roellig followed the same lack of fixed pattern. Each day was an opportunity to investigate the unknown, to learn something new and to finish in a new place. This curiosity drove his interest and passion for his physics research as well.

Len was born in Detroit on May 17, 1927, to Oscar and Laura Roellig. He graduated from Denby High School and the University of Michigan, where he received A.B., M.S., and Ph.D. degrees in physics.

At Wayne State University Len served as physics professor, Dean of the School of Arts and Sciences, and Associate Provost. Len, along with departmental colleague Henry Bohm, played a pivotal role in the design and development of our current Physics Building. It is because of the Len and Henry's insight and experience during the planning and construction of the building (from February 1962 to May 1965) that the resulting structure has turned out to be very functional and reasonably flexible. From Wayne State, Len moved on to the City University of New York, serving there as Vice Chancellor for over a decade, before moving back to his first love, physics research. Len finished his professional career as professor of physics at City

College, NY. After retiring, he and his wife moved to Boulder, Colorado, where he kept an office at the University of Colorado Physics Department, teaching the occasional guest lecture and auditing classes that interested him - interests that ranged from astrophysics to ancient history. He passed away at his home in Boulder on February 12, 2010.

Len's work as a professor and college administrator tells only a part of his professional story. Throughout his career as a research scientist he was affectionately known by his colleagues worldwide as "Dr. Positron." While at Wayne State, he founded the university's positron annihilation group. As a visiting faculty member, he founded a similar program at University College, London. While in New York he conducted his research at Brookhaven National Laboratory, and in Switzerland he worked at the Paul Scherer Institute for Natural and Engineering Sciences. In 1965, Len, together with A. T. Stewart, organized the first International Conference on Positron Annihilation, a conference series that recently held its fifteenth meeting in 2009.

While his work was his accomplishment and defined his days, his family was his contribution and defined his life. Len is survived by his loving wife of fifty-seven years, Pauline, his three sons, and his four grandchildren. Len Roellig was a physics colleague, a husband, a brother, a father, a grandfather, and a friend. But most importantly, he was a student of life and by example he was a teacher to us all. ■

Acknowledgments

The Department of Physics and Astronomy is very grateful to the following individuals and corporations for their new and continuing financial support during the period November 2008 to October 2010. These contributions are used to support the travel of both undergraduate and graduate students to attend APS meetings and other physics conferences. These funds are also used to award scholarships to outstanding undergraduate physics majors and to support the research of graduate students. In addition, our student computer lab has been completely refurbished with new computers, software, desks, and chairs as a result of the generosity of our alumni, faculty, and friends who contributed to these funds. If you are considering making a tax-deductible gift to our Department, please see the Wayne State Fund Gift Form in this newsletter. ■

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Light and Dark Matters: An online Research Supplement

We are happy to introduce a new online Physics Magazine – a supplement to the *Physics and Astronomy Matters* newsletter – called *Light & Dark Matters*. This new online magazine was developed to highlight cutting edge research being done by our

physics faculty and staff, and to be used as an educational aid and recruitment tool for those visiting our website.

This online magazine is different from the *Physics and Astronomy Matters* newsletter and is just another way to bring

you up-to-date news and information about our dynamic department. To visit our magazine, go to physics.wayne.edu and click on *Physics Magazine/Light & Dark Matters Magazine*. ■

