Physics Department NEWSLETTER

LEHIGH UNIVERSITY

October 2011

Highlights

Matt Smith selected as participant for the Lindau conference to mingle with Nobel Price winners

The image shows Matt with other young researchers from around the world during Bavaria Night.

Matt Smith, a graduate student and GAANN fellow who is doing research in biophysics with Prof. Vavylonis was selected to participate as Young Researcher at the 2011 Nobel Prize Winners Meeting in Physiology or Medicine at Lindau, Germany. To be selected he passed two very competitive stages of selection by NIH and the organizers. According to Lehigh U President Alice Gast, Lehigh students have applied to this event for several years and, to her knowledge, he was the first from Lehigh to receive an invitation to attend.

From the Chair's Desk

Sorry, it has been a while since the last newsletter.. After many years of collecting news and putting them together, W. Beall Fowler handed on the baton. As part of the transition, we have tried to redesign the letter and added some pictures. I hope you will enjoy the collection of news and take it as an incentive to let us know about your success and send us stories. Please send any news that you would like to share directly to the department chair.

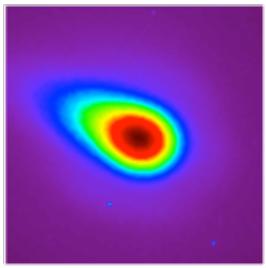
-Volkmar Dierolf

COLLOQUIUM SERIES

Our Colloquium series organized by J. Toulouse runs every Thursday at 4:10pm. It continues to attract high-profile speakers and audiences from around and beyond campus. Some highlights include, a presentation by *G. Kuczynski*, a Lehigh alumn who works at PPL. He reviewed four days after the Fukushima nuclear accident, the safety measures of a nuclear power plant and how to understand the scattered news we heard at the time out of Japan. An other highlight was *Prof. Ian Shipsey* from Purdue, who gave an emotion-filled colloquium on Bionic Hearing, explaining the physics of cochlear implants that gave him back his own hearing after being deaf for more than 10yrs and enabled him to hear the voice of his daughter for the first time.

PHYSICISTS TAKE INSPIRATION FROM SPILLED MILK

Prof. Ivan Biaggio and his graduate student *Pavel Irkhin* developed an imaging technique that makes it possible to directly observe light emitting excitons as they diffuse in a new material that is being explored for its extra-ordinary electronic properties. Called rubrene, it is one of a new generation of



single-crystal organic semiconductors.. This achievement by represents the first time that an advanced imaging technique has been used to witness the long-range diffusion of energy-carrying excitons in an organic crystal. This work has been recently published in Phys. Review Letters.

The image shows a pattern of light emitted by excitons that diffuse in one dominant direction.

RESEARCH AND FACULTY HIGHLIGHTS

Gary DeLeo has developed Photo-video-narratives for his Outreach program activities. They can be found on his science outreach program, www. lehighsla.com. Gary has had a publication accepted by the prestigious National Science Teachers Association (NSTA) journal, The Science Teacher, titled "A Computer Story: Complexity from Simplicity". *Volkmar Dierolf* organized a symposium on Rare Earth Ions for Photonic Application for the MRS meeting in San Francisco (April, 2011). He published more than 10 journal articles in the 2010/2011 academic year. and was Co-Editor of a book published by Springer on Rare-Earth Doped III-Nitrides for Optoelectronic and Spintronic Applications. *A. P. Hickman* was awarded a Lehigh faculty grant for international travel, which he used to spend two weeks at the University of Montpellier II in Montpellier, France in June, 2010.

Outreach event with Parkland Students

Yong Kim and his Ph.D student, Ryan P. Cress, were able to combine model experiments and Monte-Carlo simulation to visualize atomistic dynamics within a disordered binary metallic alloy under thermal forcing. It has become now possible to invoke theoretical formalisms. The article detailing the new approach has been accepted for publication. *J. Licini* gave an invited talk about the carbon nanotube project at the Electrochemical Society meeting in Montreal in March 2011. (cont. pg. 3)

GRADUATE STUDENT NEWS

As part of a college assessment program, it was our turn last spring to be reviewed by an external committee. The resulting report recognized the strength of our department which is evidenced by the success of our students. At the May Commencement and Hooding Ceremonies the Physics department was well represented by *Seth Ashman* (4), *P. Belloni* (5) *Michelle Fleischman, David Kashinski* (2), *Jeffrey Stephens, Gregory Stone, Lanlin Wen* (1) , *Chris Wolfe,* and *Nathaniel Woodward* (3). Despite the hard economy almost all found jobs in industry, teaching in colleges, and as post-docs, in industry and national labs. Since then already three more students defended their thesis: *Christina Aragona, Phil Laporta,* and *Peter Tupa*. Thanks to financial support by C. Albright, the M. Yoshida fund and the estate of W. Smith, our graduate students were able to attend conferences around the world including places such as Paris, Warshaw, Edinburg, and Strasbourg but also enabled a strong showing of our program at APS, AAS, ASCP, and MRS meetings. *Tyler Drake* won the best poster award at the 2010 SIAM meeting in the Life Sciences. Students are frequent co-authors on papers and even book chapter and also received external recognition through prizes such as Sigma XI Research, NASA Observation Grant (*A. Marsh)* as well as Lehigh Graduate Student Teaching Award (*P. LaPorta*). The newly formed Physics Graduate Student Association at Lehigh ramped up activities and organized two BBQs: a Spring BBQ and a BBQ for the incoming students. For more info on PGSA, contact Jon Poplawsky (jdp207).

Hooding ceremony May 2011

New Graduate Students (Fall 2011)

FACULTY NEWS (CONT)

G. McSwain has presented an invited review of the multi wavelength properties of Be/X-ray binaries in Valencia, Spain (July 2011). She has been awarded observing time and grant support from NASA's Fermi Gamma-ray Space Telescope and the European Space Agency's XMM-Newton Observatory. During 2010, she and her graduate students have authored or co-authored 13 refereed journal articles. *D. Ou-Yang* gave a large number of invited talks on his recent accomplishments in the field of optical bottles and a constant stream of visitors of international visitors come to Lehigh to learn about the technique in his lab. *S.V. Rotkin* gave a series of invited talks and lectures on the topics ranging from quantum heat transfer to lanthanide complexes with DNA wrapped nanotubes. He gave an internet video-lecture for Palisades high schoolers on nanotechnology. Besides 6 regular journal articles, he has published a review article as well as two book chapters. He was also co-organizer of symposia at two Meetings of the Electrochemical Society (5/1-6/11 Montreal, Canada and 4/25-30/10, Vancouver, Canada) as well as of the Lehigh's Nano-Energy Workshop, (9/13-14/10). *M. Stavola* agreed to continue for an extra year as Associate Dean for Research and Graduate Studies in the College. M. Stavola was named a Fellow of the Institute of Physics (United Kingdom) in April 2011. *D. Vavylonis* continues fruitful collaborations with colleagues at Ohio State University, Tohoku University, and University of Miami. He hosted collaborators Naoki Watanabe and Fulvia Verde in December 2010. Over the past year, his group presented their work in international conferences in the US, India, Germany, Scotland, France and Canada.

UNDERGRADUATE NEWS

Our graduating class was small, this spring, but it stood out in quality since all five finished either with honors (P. *DeNoia*, *J. Nydell*), high honors (*C. Burke, C. Mitchell*) or highest honors (*E. Coughlin*). Most of our under-graduate students are heavily involved in research. For instance, several students worked on projects in nanoscience with Prof. Rotkin's group throughout the year. Several of them received summer fellowship from Sherman Fairchild Center (*C. Devulder*) or the environmental initiative (M. Blades) to pursuit their research during the summer. One student, *T. Flores*, presented his results at the Annual Meeting of the National Societies of Black and Hispanic Physicists in Austin TX in Fall 2011

T. Flores giving his presentation during the REU program

During the summer, the department ran, under the leadership of Prof. Huennekens, another successful REU program with a total of 23 students.

RESEARCH FUNDING

Looking back at difficult funding years, it is encouraging to see the department was still quite successful in attracting significant funding, which include graduate student fellowship support for graduate students, graduate student RA support, and support for a post-docs. The grants total more than $2M and are distributed well throughout all research areas of the department:

- USDE-GAANN: *Fellowship Program in Physics at Lehigh University* (V. Dierolf, G. DeLeo,)
- NSF: *High-Resolution Spectroscopy of Heteronuclear Alkali Molecules: Structure and Dynamic*, (J. Huennekens, P. Hickman)
- *Princeton Plasma Physics Laboratory: Fusion Simulation Project* FSP, (A.Kritz,, T. Rafiq)
- NSF-DMR: *Materials World Network: Novel Material Platforms with Reduced Dimensionality for Next Generation Ferroelectric Photonics* (V. Dierolf).
- NSF: F*ormation and Interaction of Be Circumstellar Disks*, (G. McSwain)
- NASA: *Multiwavelength Observation of Gamma-ray Binary Candidates,* G.McSwain)
- AFOSRL: *Near-field Thermal Coupling of a Nanoscale Interface and QED Kaptiza Conductance of Nano-Carbon Interconnect Materials*,(S.V. Rotkin)
- NSF: *EAGER:Exploiting Strain-Induced Coupling between Rare Earth Ions and the GaN host for Improved Electroluminescence and Magnetic Devices*, (V. Dierolf)

POST-DOC AND RESEARCH SCIENTISTS NEWS

The department has a growing numbers of Post-doc and Research Scientists that are involved in the research of our faculty.. As a consequence the department has established a *mentoring program* lead by Arnold Kritz that is intended to help these young scientist to become successful in their pursuit of an academic or other professional career.

Alexei Pankin, a Senior Research Scientist started a new position at TechX Corporation in Boulder, CO but he continues to work closely with A. Kritz's group on several projects.

Gillian L. Ryan, a postdoc in our department, was honored by the Lehigh University Women's Center and presented with a Waves Award in Spring 2011. The Waves Awards are presented to women, and allies of women, who have exhibited a commitment to activism, advocacy, and creating opportunities for women within the Lehigh University community.

Lehigh proves to be a good stepping stone. Two post-docs in Prof. Vavylonis' group moved on, *Eddy Yusuf* moved to the Physics Education Department, Surya College of Education, Indonesia as Assistant Professor, while *Alex Veksler* accepted a postdoc position at Rice University. *Liangcheng Zhou* who worked on joint project with Prof. Ou-Yang, Biaggio, and Dierolf, accepted a new post-doc position at Princeton where he continues to work on nano-photonics in the group of Steven Chou in the Electrical Engineering Dept. Alexsandr Ryasnyanskiy took a position at Optigrate Inc. in Orlando, FL. Antoinio Perez went to Newcastle University in the UK.

ALUMNI NEWS

Nicholas P. Bigelow, BS 80,81, was appointed to the Board of Trustees at Lehigh University. Nick is currently Department Chair and Lee A. DuBridge Professor of Physics at the University of Rochester

Nick Bigelow

Keith Blanks, BS '87,MS '90, Ph.D '95, now a Principal Scientist at Aerospace Corp. in Colorado visited the department and held a colloquium. He is also an external advisor part of a Lehigh taskforce that develops strategies to increase the number minorities in STEM fields.

Derrick Boucher, Ph.D '93 moved to Florida to escape the winter . He is now an Associate Professor at the Florida Gulf State University.

Darlene Dreyer, BS EP' 97 has been appointed Executive Director at Paducah Symphony in Clarksville, Tennessee

James *Dufty*, Ph.D '67, now Prof at the University of Florida was elected as a Fellow of APS for his numerous contributions to non-equilibrium statistical mechanics.

Z. Fleischman '08 moved in September from the ARL in Aberdeen to Adelphi working in the laser group. *Naveen Jha* Ph.D '08 started a new position at FDA in Silver Spring Maryland

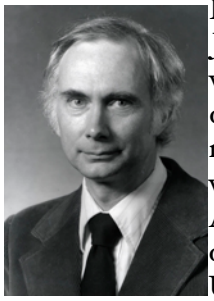
Katie Weber Shaw, BS '07 got married to Jeff Shaw

Samson Penn Tafon Ph.D 07' accepted a position as a Medical Physicist in the Medical City of Saudi Arabia.

Samson Penn Tafon

David Carroll, Ph.D retired and sent us the following overview of his career. *After graduating in '67 with a B.S. in E.P., I took a job in the aerospace industry in Connecticut. I enjoyed the work, but was not ready to settle down, so I made a 180 degree turn after a year and joined the Peace Corps. Following three months of language training, it was off to Afghanistan I spent the next two years teaching high school math and science in Kandahar. This was before the Soviet invasion and it was a very different country. Best experience of my life! Also met my wife there (another Volunteer). Upon returning stateside, I taught for a year in Boston, then went to law school. It turned out to be a great career choice for me. I ultimately settled in NJ and have spent the past 36 years practicing education law, mostly representing school districts. I have just retired from full time practice and am looking forward to an active life doing everything I enjoy--reading, golf and the outdoors! The discipline of physics served me well in law. I remain in awe of my former classmates and their brilliance. There were only about 8 of us in Physics or EP, and I recall three graduating summa cum laude, a difficult feat in the major, particularly given the grading at the time.*

REMEMBERING



Wes Smith, 'BS '51, 'BS 52, Professor in the Department for 43 years passed away January 2, 2010 in Naples, Florida. He was 81 years old.. His research area dealt with shock waves, high-speed mass transfer and elastic and inelastic waves in metals. He was awarded the Alfred Noble Robinson Award for his outstanding service to Lehigh University in 1962.

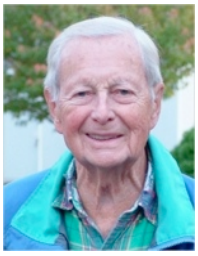
Glenn Bateman, Ph.D Princeton 1970, passed away on August 5th, 2011 at age 67. Glenn was a Research Professor and Co-leader of Lehigh University Fusion Physics Research for the past 15 years. He was an author of more than 100 published papers, and as a Fellow of the American Physical Society.

Hal Clarke, who worked in the department as a technician between 1968 to 1987 passed away February 13, 2011.

Marco Paolo Fontana passed away 27 March 2011. Marco Paolo Fontana was an experimental physicist, noted for his work in Raman and neutron scattering spectroscopies. He was a leading figure in the Physics Department of the University of Parma, serving as a Head for many years. After receiving his Ph.D in Physics from Lehigh University he joined the Parma Institute of Physics in 1972. After first working on color centers in ionic crystals, he moved to the investigation of the dynamics of molecules where he made major contributions for the understanding of the dynamics of glasses, water and liquid crystals.

Eduardo Calabrese died on April 6, 2011 in Parma, Italy. He was born in Messina, Italy in 1943. He received the "laurea" in Physics degree from the University of Messina, and the Ph.D. in Physics from Lehigh University in 1971 where his advisor was Beall Fowler. In September 2010 he retired from his position as a professor at the University of Parma. His professional interests included educational uses of the computer which involve internet and distance learning.

Les Erich, PhD '61. who had a very successful career as Professor at Moravian and Lafayette College and served in past as vice president of Sigma XI , passed away Febr. 2010 in Allentown.



Ed Uhl, graduated from Lehigh in 1940 with a B.S. in engineering physics. He was elected to Lehigh's Board of Trustees in 1979, and served as Chairman from 1986-1990 He had a very successful career as an aerospace executive leading him to become chairman of Fairchild Industries. As a young soldier during World War II, he helped to develop the bazooka, a devastatingly effective weapon against German tanks.

Latest News and Upcoming events

Nov. 11, 2011: *Gotham-Metro Condensed Matter Meeting, New York Academy of Sciences*

Lehigh has officially joined the New York Academy of Science Condensed Matter Group, a sub-division of the New York Academy of Sciences (NYAS). Physics graduate student Yi Hu is serving as the student representative of Lehigh in the group as well as a member of the organizing committee of the Gotham-Metro Condensed Matter Meeting (GMCMM). The organization aims in creating a global community of science, connecting scientists from over a dozen institutions in the New York metropolitan area and providing an unique platform to bring together the best in local condensed matter physics to its bi-annual meeting. Being a member of this group provides great opportunities to our community

Dec. 12, 2011: *Department Holiday Party*