COLLEGE OF ENGINEERING

DEPARTMENT OF ELECTRICAL ENGINEERING

PENNSTATE

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CHRISTOPHER RASPANTI MEMORIAL LAB DEDICATION

A formal dedication of the Christopher Raspanti Memorial Digital Signal Processing/Digital Music Lab was held on Friday, May 21. Christopher Raspanti was an electrical engineering student at Penn State from 2002 to 2005. He had a strong interest in digital music and planned to specialize in digital signal processing. Chris passed away unexpectedly in 2005 while a student at Penn State. After his death, Christopher's family established a memorial fund to purchase equipment for the lab in his memory.

Pictured here with the memorial plaque are David Salvia, undergraduate program coordinator,left; Bill and Kimi Raspanti, Christopher's parents; and Ken Jenkins, department head.

Please note change in meeting date:

Society of Penn State Electrical Engineers
SPSEE Spring Meeting

Friday, June 18

11:30 a.m.-1:30 p.m. (light lunch will be provided)
101 Electrical Engineering East

Follow this link to register on-line or email cls118@psu.edu

A representation of the electrical engineering undergraduate class of 2010.

CONGRATULATIONS TO THE SPRING 2010 ELECTRICAL ENGINEERING GRADUATES

Master's Degree:

Subhade Chakraborty	Suran Cui	Pradyumna Desale
Xue Dong	Supratim Ghosh	Kai He
Nathaniel Hobbs	Zhenyan Hua	Yifan Huang
Somesh Kashyap	Jeong Kim	Hemant Kumar
Lei Mei	Ninad Mokhariwalel	Dheepak Ramaswamy
Vikram Sampath Kumar	Matthew Sunderland	Ryan Weichel
Jimmy Yao	Junyu Yao	

Doctoral Degree:

Jonathan Bringuier	Tsung-Ta Ho	Jaekyun Kim
Ramakrishnan Krishnan	Kongkuo Lu	Cheng Luo
Xiaoqiang Xiao	Danhong Zhong	

Bachelor's Degree:

Eighty-five students received their bachelor's degree.

Daniel M. Feuerbach was the student marshal for the Department of Electrical Engineering at the spring commencement ceremony on May 14. He received a bachelor of science degree in electrical engineering with a minor in mathematics.

He chose David Salvia, assistant professor of electrical engineering, to be his faculty escort.

College of Engineering student marshals are selected for their outstanding academic achievement and contributions to engineering student life.

At Penn State, his extracurricular activities included serving as rules and regulations pass team captain for THON 2010, the Penn State IFC/Panhellenic Dance Marathon. He volunteered with Habitat for Humanity and served as a teaching intern for the Penn State electrical engineering department.

He is a member of the Eta Kappa Nu Electrical and Computer Engineering Honor Society, the Penn State Red Cross Club, the Honor Society of Phi Kappa Phi, and the National Society of Collegiate Scholars.

Following graduation, Feuerbach will join Areté, Inc., as a software engineer.

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This publication is available in alternative media on request.
Penn State is committed to the affirmative action, equal opportunity, and the diversity of its workforce. U.Ed. ENG 10-90

Faculty Spotlight

Julio Urbina, assistant professor of electrical engineering, joined Penn State in 2006. Originally from Peru, Urbina discovered his interest in engineering through his fondness for building and breaking different mechanical and electrical devices. He received his bachelor's degree from the Universidad Nacional de Ingenieria in electronics engineering in 1990.

After graduation, Urbina worked as a radio frequency and digital engineer at the Jicamarca Observatory, a research institute that is funded by the National Science Foundation through a cooperative agreement with Cornell University. One of his projects was to design and construct a radar controller for a mesosphere-stratosphere-troposphere radar that was going to be deployed in Antarctica. Urbina traveled to Antarctica with his colleagues to install and construct this radar that was designed to study polar summer mesosphere echoes. Urbina states, "I had an extraordinary experience working at Jicamarca and these experiences developed my passion for radar remote sensing to study the earth's upper atmosphere."

After deciding that he wanted to further his education, Urbina traveled to the University of Illinois and earned his master's and doctoral degrees in electrical engineering in 1996 and 2002, respectively. At Illinois, Urbina realized that he enjoyed both teaching and research so going into academia was a natural fit. Urbina joined the Donaghey College of Information Science and Systems Engineering at University of Arkansas at Little Rock in 2002.

Urbina was interested in joining Penn State to complement the vigorous radar remote sensing program established in the electrical engineering department within the Communications and Space Sciences Laboratory. Additionally, the projects that he was involved in prior to coming to Penn State could increase collaboration with institutions outside the university. Urbina explains, "Currently I collaborate with scientists at the Jicamarca Observartory, Arecibo Observatory, Johns Hopkins University/Applied Physics Laboratory, University of Illinois at Urbana-Champaign, University of Puerto Rico at Mayaguez, to name a few."

Urbina's research at Penn State has been focused on developing a prototype of the next generation of meteor radars with an improved ability for deriving neutral winds, temperatures, individual meteor properties, and a more accurate characterization of the global meteor flux and its effect on upper atmospheric physics, and space weather. This work involves both the radar system design and the experimental deployment of the system. The system will be portable so that it can be deployed at remote sites (e.g the Charged Aerosol Release Experiment in Bermuda 2009, the Equatorial Vortex Experiment in Kwajalein 2012). "I am also creating a new radio observatory at Ag Progress at Rock Springs," stated Urbina. "The goal of this new facility is to provide research opportunities to undergrad and grad students in space science and communication topics including instrumentation and space-weather. We are building the meteor radar on this site." His research group is also involved with a variety of activities at the Arecibo Observatory that involve new hardware development and science studies of the E-region of the ionosphere. All of this research is funded by the National Science Foundation.

Urbina enjoys working with both undergraduate and graduate students. Urbina said, "Penn State is an amazing place; it has wonderful facilities and the students are very motivated." He has taught electrical engineering courses at the freshman, junior, senior, and graduate levels. He has mentored undergraduate students in the Summer Research Experience for Undergraduates and Summer Research Opportunities Program.

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Urbina continued

Urbina is the faculty advisor of the Engineering Graduate Student Council. He is a member of the International Union of Radio Science, the American Geophysical Union, the Institute of Electrical and Electronics Engineers, Association for Computing Machinery, and the American Society for Engineering Education.

In his spare time, Urbina likes to swim, play go and chess, and read all kinds of books. He and his wife, Kazumi, live in Port Matilda.

Student Spotlight

Jeffrey Lackey, senior in electrical engineering, plans on graduating in December. Originally from Murrysville, PA, Lackey chose Penn State because of the number of opportunities and programs offered. Lackey comments, "I felt comfortable knowing that if I pursued my academic goals, there would be numerous activities and projects that I could get involved in." He chose electrical engineering because of the diverse program and broad range of technical skills.

Lackey has taken advantage of the opportunities provided at Penn State. In 2008, he contributed to the creation of a student chapter of the National Electrical Contractors Association (NECA) and has served as the chapter president and vice president. The NECA student chapter has been in the planning stages of their second community service project in Roatan, Honduras. A team of NECA volunteers will be traveling to Honduras during spring break 2011 to install a 2.5kW ground mounted solar array to power a pump at a community well in Consolation Baigh. In planning for this project, Lackey and several team members traveled to Honduras in May to perform site assessments. This well serves over 2,000 people and the community was incurring large amounts of debt running the pump due to the extremely high price of electricity.

Although Lackey will have already graduated, he is planning on joining the NECA group in 2011. Lackey stated, "Our group has a unique opportunity. We have the funding to be able to install very expensive, yet highly effective, systems in a place where it is truly needed. Currently, all of the power on Roatan is supplied by tractor-trailer sized diesel generators and the cost per kWh is absolutely stunning. Solar offers a clean and reliable alternative."

Along with starting projects in Honduras, the Penn State NECA student chapter has been tasked to create a how-to guide that NECA student chapters at other universities can use to implement a similar program and begin a relationship with a community in Central America.

Lackey has work experience as an intern at Westinghouse Electric Company where he worked on non-safety control systems cabinet design for a nuclear power plant in Almaraz, Spain. Currently, Lackey is contemplating graduate school but would first like to complete a year of service with a program such as City Year or Americorps Vista.

In his spare time, Lackey enjoys outdoor activities including backpacking, hiking, cycling, and swimming.

Optical Wireless Applications Workshop on Establishing a National Science Foundation Industry/University Cooperative Research Center

This workshop will be held on June 8-10 at the Penn-Stater Conference Center Hotel in State College.

Under the auspices of the National Science Foundation, Penn State, Tufts University and the University of California Riverside are collaborating to establish an Industry/University Cooperative Research Center, with Penn State as the lead institution. This is a planning meeting to discuss the potential to establish an interdisciplinary research center, providing leadership to develop a new generation of environment-friendly, extremely wideband optical wireless technology applications, and employing solid-state devices for communications, networking, imaging, and remote sensing applications.

Visible Light Communications is an emerging technology that utilizes the high-speed switching properties of white LED's as a method of wireless data communication with data rates equivalent to conventional 802.11 wireless networks and additional benefits of:

Energy efficiency – uses LED lighting infrastructure with no additional power requirements.

- Wider spectrum – more capacity than Wi-Fi frequency bands
- Improved Security – does not penetrate beyond building walls
- No electromagnetic interference – alleviates health concerns over RF transmissions

As LED's increasingly displace incandescent lighting over the next few years, general applications of VLC technology are expected to include wireless Internet access, vehicle to vehicle communications, broadcast from LED signage, machine to machine communications etc.

The research team believes that VLC technology also has potential in a number of specialized application areas including the following:

- Hospital and Healthcare – enabling mobility and data communications in hospitals
- Hazardous Environments – enabling data communications in environments where RF is potentially dangerous (such as Oil & Gas, Petrochemicals and Mining)
- Commercial Aviation – enabling wireless data communications such as in flight entertainment and personal communications
- Corporate and Organizational Security – enabling the use of Wireless Networks in applications where WiFi presents a security risk
- Wi-Fi Spectrum Relief – providing additional bandwidth in environments where unlicensed communication bands are congested
- Green Computing – greater energy efficiency
- Defense and Military Applications – enabling high data rate wireless communications within military vehicles and aircraft
- Underwater communications – between divers and/or remote operated vehicles.

This workshop will be of interest to engineers, leaders and executives in visionary companies that have a goal to extend and enhance their products and services with newly designed optical sources, transmitters, detectors and receivers.

For more information, please visit the workshop website: http://cictr.ee.psu.edu/workshop-owa

Sabbatical experience

The leave of absence with pay (sabbatical leave) provides tenured faculty members with an opportunity for growth and renewal throughout his/her professional career in an environment outside of the daily work routine at Penn State. Various forms of sabbatical are possible and encouraged as long as they benefit faculty member development, and hence, the University. A sabbatical leave can be awarded every six years to tenured faculty members based on the strength of their application.

As an example, Jerzy Ruzyllo, Distinguished Professor of Electrical Engineering, was on sabbatical during the spring semester. Ruzyllo was invited by the European Union's Development Program, administered at Warsaw University of Technology (WUT) by the Center for Advanced Studies, to be a distinguished visiting professor. This program, created for universities in the countries which are newer members of the European Union (EU), provides the opportunity to bring renowned international scholars to their university for the purpose of exposing faculty and students to the academic experiences in countries outside of the EU, the United States in particular.

During his three month long stay in Warsaw, Ruzyllo was involved in a wide range of activities including three research projects and fourteen seminar and lecture presentations. The research included a silicon carbide research proposal, a study of non-contact electrical characterization of semiconductors, and the development of the thin-film transistor fabrication process. Included in the presentations was a lecture delivered to a university-wide audience of three hundred members of the faculty and students titled "Semiconductor in 21st Century."

In a recruitment effort, WUT's Department of Electronics and Information Technology, is reaching out to high school graduates. Ruzyllo presented to several hundred high school students who are invited for an afternoon session once a month. This initiative stems from the need to spark an interest in science and technology in these young people before they determine their educational path. This need is a trend we are seeing in the United States as well.

Ruzyllo comments, "I believe that the sabbatical experience helps faculty members gain a different perspective of an overall academic experience as well as forge long lasting ties at the personal and institutional level beneficial to Penn State."

On May 1, the Central Pennsylvania Section of the IEEE hosted the "1st Annual Professional Development Workshop" at the Penn Stater Conference Center. This first of its kind of event was designed to promote the understanding and application of specific areas of interest to both the academic and industrial communities of the Central Pennsylvania region. The focus of this all day workshop was on the Remote Sensing Techniques of LIDAR and Noise Radar. Morning and afternoon seminars were given by Dr. Tim Kane and Dr. Ram M. Narayanan (both of the Department of Electrical Engineering at Penn State). Attendance included but was not limited to local defense industry, academic research laboratories, and students from surrounding universities.

Further details and updates on the Workshop and the Central Pennsylvania Section of the IEEE can be found at: http://ieee.org/go/centralpa.