PHYSICS & ENGINEERING DEPARTMENT

Elizabethtown College

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Solar Powered Vehicle Makes Rounds

This past spring, first year students in the Introduction to Engineering course were presented with the challenge of designing and constructing solar powered vehicles capable of transporting one person around Lake Placida. Four teams, equipped with just a 120 Watt solar panel, $400.00 and their own unique designs, created working vehicles that "raced" each other in a contest on a sunny day in late April. The race was covered by the Lancaster newspaper and as a result, two local groups asked the department to bring the vehicles to them as part of a presentation. Box4 (designed and built by George Bishop, Chad Wright, Curtis Felts, Ben Carvell, Jason Porter, Mark Dinse, David St. John, and Gianfranco Vela), which won the solar race, was the chosen vehicle to take to the presentations. In June, the vehicle was demonstrated at the East Petersburg Rotary Club by Professor McBride and then again in August, at a summer camp in Middletown which focused on "Transportation of the Future". At the summer camp, Professors DeGoede and McBride gave a presentation on future transportation technologies to eighteen elementary age students. Following the presentation, eager students were given the opportunity to take turns driving Box4 around the parking lot.

Introduction to Engineering II Class, Professor McBride, Professor Ferruzza, and all participants after the Solar Powered Endurance Vehicle Competition, Spring 2004

Recognizing of the Retired Chair

This year the Physics and Engineering department experienced some changes within the faculty. Professor David Ferruzza has gone into what he calls "half-timed phase retirement" and has passed his title of Department Chair of the Physics and Engineering department onto Professor Kurt DeGoede. Prof Ferruzza had previously held this position for 13 years, since June of 1991. He actually asked for this change allowing for the next "giant leap forward". Prof Ferruzza began working as an adjunct faculty member in 1984 while still employed at Clark Filter as "Director of Engineering and Tooling", where he remained until 1990. At this time he was hired by Provost Ritsch with the stated purpose to "Grow the Department". Professor David Ferruzza was then appointed Department Chair in 1991 when previous Chair John Gaffney stepped down. David Ferruzza hasn't left us entirely. He will retain the title and duties as Director of Engineering programs and will also teach one class per semester;

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In this detailed view from NASA's Hubble Space Telescope, the so-called **Cat's Eye Nebula** looks like the penetrating eye of the disembodied sorcerer Sauron from the film adaptation of "The Lord of the Rings." The nebula, formally cataloged NGC 6543, is every bit as inscrutable as the J.R.R. Tolkien phantom character. Though the Cat's Eye Nebula was one of the first planetary nebulae to be discovered, it is one of the most complex such nebulae seen in space.

Credit: NASA, ESA, HEIC, and The Hubble Heritage Team (STScI/AURA)

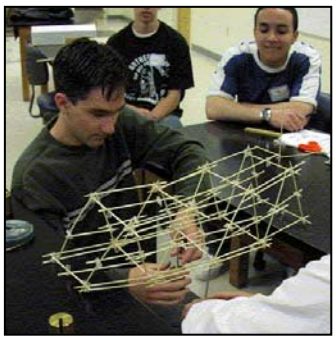
NASA Scientist speaks at Elizabethtown

By Dr. Troy McBride, Physics and Engineering Department

NASA scientist, Dr. H. James Wood, visited Elizabethtown College on September 14th and 15th. During his visit, he attended a class, gave two presentations and stayed overnight before having breakfast with students at the Marketplace. "Dr. Wood is an astronomer and serves as an optical engineer for the Optics Branch at NASA's Goddard Space Flight Center. Since June 1990, he has been Optics Lead Engineer on the Hubble Space Telescope (HST) Project. He led the team that successfully determined the optical prescription of HST while in orbit. He then led NASA's effort to develop and test the corrective optics for HST." (IEEE Newsletter, Sept. -04)

The evening began with a demonstration and presentation by the Robotics and Machine Intelligence Club (Steve Sanko, Snehesh Shrestha, Jonas Groff, and advisor Dr. Joe Wunderlich). A delicious dinner was then served, during which students and faculty members were able to interact with local [electrical] engineers. Dr. Wood capped off the evening with a captivating talk which included breathtaking photographs from recent NASA missions to Mars, other planets in the Solar System and many new images and recent discoveries from the Hubble Space Telescope. He concluded by describing the potential near-term NASA mission to send a robotic spacecraft to service the Hubble Space Telescope.

During the evening, 50 students, 10 faculty members and 35 IEEE members from local industries showed up to listen to the exciting presentations. Dr. H. James Wood spoke as part of a joint program organized by the local Susquehanna IEEE (Electrical Engineering) chapter and the Physics and Engineering Department at the College.



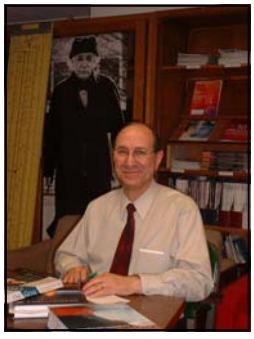
Engineering student Matt Kuhns ('05) adds weights to a model bridge built by the students

Summer Camp and Physics Day

For the past three years, Professor DeGoede along with physics students studying secondary education have hosted the physics day for the student organized and run SIFEdicus science and business camp (SIFE, business, and Medicus, Pre-Med). Approximately 30 3rd – 5th grade students from the surrounding communities have participated each year.

On physics day this year, the students learned about trusses and used West Point Bridge Designer to design and test truss bridges. The student's designs were evaluated on cost and aesthetics. The students had a great time working on their bridges and many were anxious to get home and download the free software to try some additional designs (http://bridgecontest.usma.edu). The bridges the students designed ranged from low cost efficient designs to extravagant artistic models, but all met the stated load requirements.

Physics and Engineering students Matt Swavely and Missy Doll worked with Professor DeGoede in support of SIFEdicus Physics Day this summer.



David Ferruzza
Director of Engineering Programs

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this semester he is teaching Physics 200. You may also find him offering advice and guidance to Prof DeGoede (only when asked of course) and mentoring seniors that are working on their senior engineering projects.

Professor David Ferruzza has these final words of advice for our new Department Chair: "Kurt DeGoede hardly needs advice. I am confident the department is "in good hands" and will make forward strides I would not have dreamed of".

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Humor: There are 10 types of people in the world; those that know binary and those that have friends.—Anonymous

Tyco grant equipment reinforces classes and research at Elizabethtown College

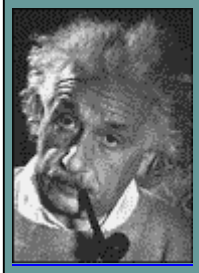
Dr. Ilan Gravé

In spring 2003, physics and engineering faculty Professor Ilan Gravé turned in a proposal to the Tyco Electronics Foundation, entitled: "Enhancing the Engineering and Physics Research and Programs at Elizabethtown College." It was a request for some specific equipment geared at improving labs for classes and for research in Physics and Engineering. With the help of physics and engineering faculty Professor Troy McBride and of Mrs. Lesley Finney, the director of corporate and foundation programs at Elizabethtown College, the proposal was successfully completed and funded by the Tyco Electronics Foundation.

It is not the first time that Tyco has been instrumental in improving Etown labs with an important grant. In 2000, equipment for a class-studio environment was awarded for the circuits and electronics courses, following a proposal written by Prof. Salem, a previous physics and engineering faculty at the college. Equipment included fast digital oscilloscopes and top-of-the-line power supplies and waveform generators.

This additional grant further enhances the circuits and electronics lab and also brings a new dimension to the electromagnetic lab in College Physics II. The larger amount of the $ 20,000 grant has been spent on equipment from Keithley Instruments and HP; more specifically: two digital sensitive source-meters and a semiconductor parameter analyzer. The combination of these pieces of equipment will boost capabilities in research and design of semiconductor devices and systems, including monitoring electrical characteristics of semiconductor and other nanostructures. This equipment will also be used in advanced circuits and electronics classes: here students will be able to study the electrical characteristics of diode, transistors, CMOS, IC's, and many additional devices and systems from current (and future) state-of-the-art electronics technology and research.

All pieces of equipment have arrived to Elizabethtown College and are now in Prof. Gravé's lab, being tested and adapted to the various tasks. Students will be able to access them during the current circuit course (EGR 210) and during Electronics (EGR 220) in spring 2005.



'There are two ways to live your life. One is as though nothing is a miracle. The other is as though everything is a miracle.'

Albert Einstein (1879-1955)

www.quotedb.com

Wunderbot II in IGVC at Oakland University

"Late in the morning, about 11:00, we arrived at the University of Oregon, tired and nervous. More than half of the participating teams had already arrived and started practicing. The first thing we saw was the University of Florida's trailer. It looked like they had brought their whole lab with them, or maybe they did," recalls Snehesh Shrestha when asked about first arriving at the Intelligent Ground Vehicle Competition (IGVC).

Wunderbot Team discussing their robot with other teams

The IGVC is held every year at Oakland University in Rochester, Michigan, and allows college students to design and construct intelligent vehicles. Students of all levels can benefit from this great opportunity. Participating schools range from Virginia Tech to the United States Military Academy.

This summer, after two years of hard work and $25,000, students Dax Kepshire, Snehesh Shrestha, Steve Sanko, Jonas Groff, Dinesh Jeyaram, Gregor Erhard, and Thomas Vaughn (alumna) made the trek to Rochester, Michigan, along with their intelligent vehicle, Wunderbot, in hopes of a win. There were three competitions that groups could enter into; design, autonomous, and navigation. Team Wunderbot competed in the design competition. This competition is judged on three things: vehicle layout, a technical paper outlining the design process, components, navigation logic, and overall layout and also a presentation of the project. Wunderbot placed 12th out of 26 teams, finishing above many top universities.

Unfortunately, the team found problems and were forced to return home.

The team feels that they have learned a lot from the other teams and from the experience.

The Wunderbot Team is pumped up for this year and have already started working and testing Wunderbot for the next competition. They have many new ideas and a solid plan for the semester. If anyone is interested in participating with Wonderbot, you may contact the Robotics and Machine Intelligence Club .

Humor: A physics student was hit by a brick falling from a house. He fainted, but came to after a while and started smiling. The onlookers were worried, so they asked him why the smile. "I just realized how lucky I am because the kinetic energy is only **half** m v squared."
—Anonymous

http://www.workjoke.com/projoke25.htm

Humor: The answer to the problem was 'log(1+x)'. A student copied the answer from the good student next to him, but didn't want to make it obvious that he was cheating, so he changed the answer slightly, to 'timber(1+x)'—Anonymous

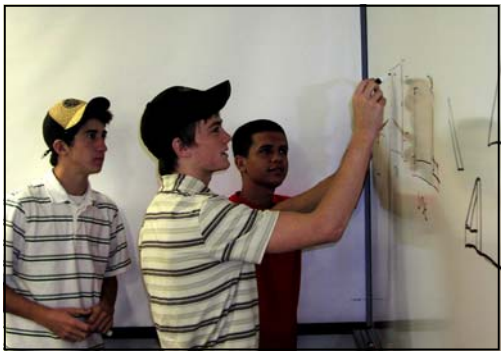
Record Breaking Class of 2008

By David Ferruzza, Director of Engineering Programs

The Fall semester always makes us all feel fresh and new, full of energy and purpose and resolve. Fall 2004 is especially meaningful with 540 first year students enrolling at the college; 36 of those entering the Physics and Engineering department. These numbers are not only astounding but also record breaking. The "yield" for Physics and Engineering students was incredibly high; more than 40%. (This number represents the number of accepted students that actually decided to enroll.) First year USA students arrived from as close as Mount Joy and as far away as Honolulu, Hawaii. Suman Jonchhe, the only international student this year, is from Nepal. Last year there were eight international students, but with tougher USA Visa restrictions many were unable to come this year.

It turns out that every one of Phys&Egr's new students is male: we didn't try for that dubious distinction. Women - though fewer in number - do better on average than do our men. New students are: Keanan Barbour-March, Adam Beard, Timothy Berger, Adam Botterbusch, Duane Breneman, Garry Brock, Daniel Cherin,Gabriel Chong, Louis Clifton, Ryan Cohick, David Coleman, Jeremy Crouse, Derek Dietz, Darren DiObilda, Daniel Enright, Robert Erdesky, Robert Fern, Zachary Galbraith, Patrick Gianelli, Andrew (Drew) Graybeal, Ryan Hess, Bryan Hudreck, Suman Jonchhe, Matthew Lauver, Dentin (DJ) Lehr, Joshua Lively, James Painter, Alex Poletto, Matthew Quinlan, Paul Stegner, Joshua Urban, Christopher Weaver, Daniel Woodhead, John Yarrish, Christopher Yorgey, and Robert Blevins (who transferred from PSU).

We welcome every new student. They are now members of an honorable department with a reputation of inventiveness and industriousness. The torch has now been partially passed to them! They join us as partners in maintaining and even improving on the moral fiber, spirit and effectiveness of the Department of Physics and Engineering at Elizabethtown.



First year engineering students Adam Beard, Pat Silva, and Alex Poletto working on a class project

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