



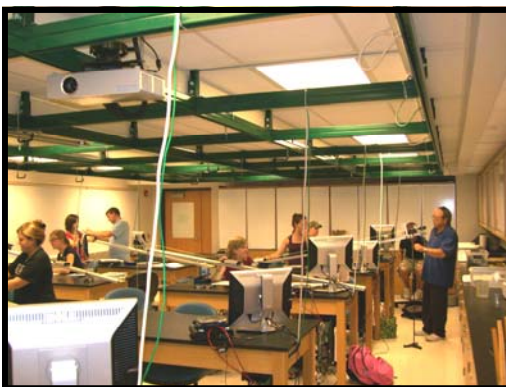
# PHYSICS & ENGINEERING DEPARTMENT

Elizabethtown College

Volume V, Issue I November 2008

## Master's Center Renovations Completed

Wow what a change! If you had the chance to visit the department over Homecoming weekend, you may not have recognized the place. The renovations to Esbenshade are essentially complete and include a new department commons area with all faculty offices and the new student hideaway, the renovation of all laboratories, and several new teaching, project, and research spaces. The renovations include renovated mechanics, electronics and geophysics teaching labs;



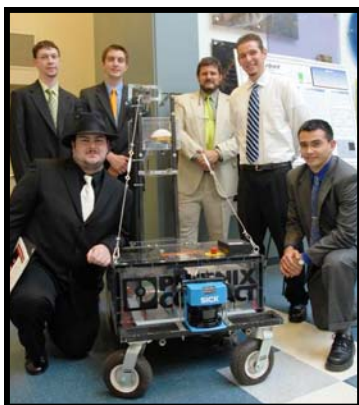
(L) The new Mechanics Lab (Room 164) formerly a multi-use classroom. (R) The new Student Hideaway located in the Physics & Engineering Commons area formally Professor Stuckey's office. More facility pictures can be found on our departmental website.

a new Design lab for teaching, planning, and staging projects; a new machine shop; a new teaching/research laboratory for robotics, renovated research labs for applied physics, advanced electronics, and biomechanics; and new research labs for thermodynamics, sustainable technologies and computational studies. Additionally, the Department borders on the new Masters Lounge & Mineral Collection and we await the completion of a 700 sq ft project-fabrication building. More images are available on the web at <http://www.etc.edu/PhysicsEngineering.aspx?topic=facilities>.

## \*\*\*BREAKING NEWS\*\*\* ABET Visit Complete

November 2nd through 4th was an exciting time for the department with our first ever evaluation visit for ABET accreditation. We are pleased to announce that the visit went very well and we fully anticipate the accreditation of the Engineering and Computer Engineering degree at the July 2009 meeting of ABET.

## The Wunderbot IV Competes in 2008 IGVC Competition



In June of 2008, Elizabethtown College's Wunderbot team presented their robot at the International Intelligent Ground Vehicle Competition (IGVC) in Michigan. After two years of hard work and dedication, Wunderbot IV competed against 46 other colleges and universities from all over the nation. The Wunderbot was in

**The Wunderbot IV visits major contributor Phoenix Contact. (L to R): Jeremy Crouse '08, Mike Patrick '10 (kneeling), David Coleman '08, Professor Wunderlich, Chris Yorgey '08, James Painter '08.**

its fourth re-design and programming stage as the team entered it in the competition. Professor Wunderlich, along with students from the Physics and Engineering Department at Elizabethtown College, tied for 15<sup>th</sup> place out of 46 teams for its design. *(continued on page 2)*

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## Department Welcomes Jennifer McFadden and Mark Gatti

The Physics & Engineering Department is pleased to announce the addition of two new staff members. Jennifer McFadden joined the department this March and has seamlessly fit into her role as Administrative Department Assistant. As Department Chair, Prof. DeGoede says, "She is so efficient and productive, sometimes we forget that she is still in her first year". Prior to coming to Elizabethtown College, she served for almost four years as a client care specialist for the John Smith Real Estate Group. Jennifer earned Associate's degrees in Secretarial Studies and Bible from Lancaster Bible College in May 2004. She has been instrumental in helping to oversee all the "paperwork" for our Accreditation Board for Engineering and Technology (ABET) self-study, making logistical arrangements for the recent ABET visit, and managing the chaos of the Department's move into our refurbished and renovated space. She has also assumed much of the responsibility for updating the Department's web page, helped with the college-wide Middle States assessment process and self-study (for which Prof. DeGoede is co-leader), and yet, as described by Prof. DeGoede, "completes whatever needs to be done in an upbeat and cheerful manner".



**New Full-time  
Admin. Assistant,  
Jennifer McFadden**

Mark Gatti was hired in August to fill the newly created position, Physics & Engineering Technician. Mark comes to us from his own grounds-keeping and property maintenance company which he operated for the last nine years. He has a BS in Mechanical Engineering from PSU Capital Campus and 16 years experience in Manufacturing Engineering at companies in the Lancaster/York area. If you have a chance to stop by the department, ask him about the "D-7 Dyno" project at Raymark (a project where he was given a collection of parts with 3 photographs of the final product and the challenge to "make it work"). Throughout his education, manufacturing and landscape maintenance experience, Mark has focused on "hands-on" systems (and repairs), gaining experience in milling, CNC programming, welding and other fabrication skills. As a student at PSU Mark worked in the engineering shop and always thought "Charlie" (the technician running that shop) had the dream job and is excited to now be in a similar position. He has been invaluable during our move into the Department's renovated space, has begun advising the Solar Splash team, and is working with First Year students on their Fall projects.



**Full-time Physics &  
Engineering Techni-  
cian, Mark Gatti**

## The Wunderbot IV Competes in the IGVC Competition *(continued from p. 1)*

Overall, Wunderbot IV placed 33<sup>rd</sup> out of 47 schools, placing just above Princeton University. Unfortunately, the Wunderbot IV team encountered last minute difficulties -- power system and system integration problems -- which resulted in lower scores.

Four 2008 graduates contributed a great deal to Wunderbot IV's success. David Coleman '08, currently in a Ph.D. program at University of Arkansas, was in charge of the autonomous path planning and obstacle avoidance theory, simulations, and real-time integration of GPS and laser range finding. His participation in the Wunderbot and his portion of the project led him to a peer-reviewed, full-length IEEE conference publication and presentation in Trento, Italy in March 2008. Chris Yorgey '08, currently at Lutron Electronics, contributed to Wunderbot IV by programming obstacle avoidance using the laser range finder and helped to integrate his system with David Coleman's GPS navigation real-time aspects. Jeremy Crouse '08, currently at Global Data Consultants, created a wireless packetized robot communication system using a newly developed standard called Joint Architecture for Unmanned Systems (JAUS). Because of Jeremy's contribution to the team, Wunderbot IV was one of 11 schools in the competition to be awarded a cash prize for successfully implementing this system. Elizabethtown College was one of only nine schools to demonstrate the more advanced "Level-2 JAUS". James Painter '08, currently at Intel Corp. and accepted into graduate studies at Stanford University beginning in January 2009, created advanced image processing to avoid white lines painted on the grass. His portion of the project received a peer-reviewed, full-length conference publication and presentation in Florida.

The four graduated seniors, current junior Michael Patrick, sophomore Dan Fenton, and Professor Wunderlich, invested a substantial amount of their time, work, and expertise to Wunderbot IV, and represented Elizabethtown College with success at the 2008 International Intelligent Ground Vehicle Competition ([www.igvc.org](http://www.igvc.org)).



## Students Compete in the EPA National Sustainable Design Expo

A team of Elizabethtown College engineering students traveled to the U.S. Environmental Protection Agency (EPA) National Sustainable Design Expo this past April 20-22, 2008, to compete with over 40 other university teams. The project team was funded through a \$10,000 P3 (People, Prosperity, and the Planet) Award from the EPA and additional College funding. The P3 Program is a national competition that enables college students to research, develop and design scientific, technical and policy solutions to sustainability challenges.

The team of six students, Gabe Chong '08, Dan Lappin '09, Phil Robinson '10, Tim Iezzi '11, Jeremiah Peropat '11, and Tom Pagut '10, was supervised by Engineering professors Troy McBride and Jean Fullerton through the vertical engineering project courses. The project title was "Hydrogen as Supplementary Energy Storage for Standalone Sites." The students worked on different parts of the project: generation, storage,



**The Elizabethtown College P3 team: Standing left to right: Professor McBride, Dan Lappin '09, Jeremiah Peropat '11, Phil Robertson '10, Tom Pagut '10, Tim Iezzi '11, Gabe Chong '08. Seated: Professor Fullerton.**



**Tim Iezzi, Dan Lappin, Jeremiah Peropat, Tom Pagut demonstrate their hydrogen supplementary storage control system on the Washington DC National Mall.**

control and power equipment conversion. For generation, the students developed a computer-controlled solar-powered hydrogen generation system that produced hydrogen only when the sun was shining and the batteries were full. The hydrogen was stored in commercial metal hydride containers. For usage, three devices were converted to run on hydrogen – a lawnmower, a weed-whacker, and a barbecue grill.

At the National Sustainable Design Expo, the team displayed its control and generation systems, as well as demonstrating the converted lawnmower, four-cycle weed trimmer, and the outdoor grill operating off the generated hydrogen. The team was interviewed by several TV stations (NBC, Clean Air TV) and newspapers, and ultimately won an "Honorable Mention."

More details and videos can be found at [www.etown.edu/p3](http://www.etown.edu/p3).

## Elizabethtown Welcomes the Class of 2012



**Half of the first-year engineering students gather for an Introduction to Engineering Lab class in the Design Lab.**

This year the Physics and Engineering Department welcomed 34 first-year students from surrounding areas and as far as Myanmar, Costa Rica, and Bangladesh. We are enjoying getting to know each of them and look forward to the unique contributions each student will make to Elizabethtown.

### Elizabethtown College Physics and Engineering

Co-Editors: Jennifer Hawkins '09

Austin DeMarco '11,

Breann Horst '11

Advisors: Jen McFadden & Prof. McBride

*Special Acknowledgement to our Faculty and Friends for their input, articles and photos.*

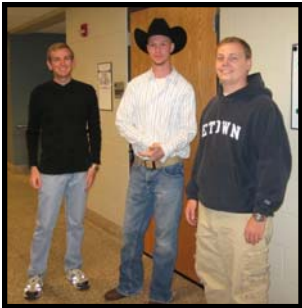
*If you wish to receive this newsletter electronically or wish to be removed from the mailing list, please email :*

[hawkinsj@etown.edu](mailto:hawkinsj@etown.edu)

# Sights from Around the Department



Top left and top middle: Physics and Engineering students participated in “Phantastic Physics” teaching local elementary school students as part of the College’s “Into the Streets” 2008. Tim Iezzi and Brandon Bear demonstrate to the students how to test their aluminum foil boats for carrying capacity with pennies. Top Right: During Homecoming weekend, the Association of Physics & Engineering Students (shown — L to R: Jenn Hawkins '09, Justin Hypnarowski '09, Professor DeGoede, Tim Iezzi '11, Dan Fenton '10) made a modification to the putting dunk tank booth so that a successful putt resulted in a pie to the face. Bottom Left: Some of our alumni Homecoming visitors included (L to R) Garry Brock '07, Jeremy Crouse '08, Adam Botterbusch '08. Bottom Middle and Left: The Masters Center renovations (p.1) also resulted in several new research labs. Shown here are Prof. McBride working on a radio system donated by Phoenix Contact for communicating with the Solar Cabin and Professor DeGoede and Stacey Lehman '10 setting up force platforms for measuring physical characteristics of different falls.



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