

THE REPORTER

Journal of the Central Indiana Section • The Institute of Electrical and Electronics Engineers, Inc.

National Engineers Children's Day at The Children's Museum of Indianapolis



Sophia, Madeline and Brant Gaumer experimenting at the Children's Museum (photo provided by Dale Gaumer)

Volunteers from a variety of central Indiana engineering organization worked together to achieve another successful Engineering Week event at the Children's Museum on Saturday February 17. Details and more photos are available on page 3.

Upcoming Events

- Jun 3-7 55th ASMS Conference on Mass Spectrometry, Indiana Convention Center
- Jun 5 PES/IAS Planning Meeting
- Jul 13-15 Phi Sigma Rho Convention 2007, Indianapolis, IN. Phi Sigma Rho is a social Sorority for women in engineering and engineering technology.
- Aug 24 Annual Baseball game and picnic at Victory Field. Fireworks to follow the game.
- Nov. 1-4 10th Annual Colloquium on International Engineering Education, Purdue University
- Nov. 7 Banquet President Gerald Jakubowski of Rose-Hulman Institute of Technology Key-Note Speaker

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Editorial Policies Each issue of The Reporter references three months - the month in which it is published and the following two months. The Reporter is not published in June, July, and August because there are generally fewer meetings held during the summer months.	
Material to be included should be submitted mid-month prior to the month it is to be published. For example, material intended for the September issue should be submitted to the Editor by August 15. The Editor will send a reminder to all IEEE Central Indiana Section entities by the 15th of the month to submit their monthly updates. If no update is received for that month, only the mission statement and contact information will be published for that entity.	
Copy should be submitted electronically. Photographs are most desirable and may be submitted in electronic format or color, black-and-white glossy, or Polaroid. Please note that black-and-white photographs reproduce best. Advertisements are welcome. Contact the editors for layout sizes and rates.	



The Children's Museum of Indianapolis

National Engineers Children's Day at The Children's Museum of Indianapolis February 17, 2007

The EWeek event at the Children's Museum was a roaring success. Various stations around the museum provided opportunities to explore.

Bridges were built; aircraft were flown; experiments were performed. IEEE member, Dale Gaumer, provided the following photos. Dale said, "My wife and I attended with grandchildren ages 4 and 6 and their parents. We all had a great time and the presenters were very good". If you are interested in volunteering next year, contact Bob Evanich (b.evanich@ieee.org), or Alan Stillerman (astiller@ieee.org).



Sophia & Madeline Gaumer



Dale Gaumer with Sophia and Madeline



Volunteer Yongkang (Mary) Gao providing paper airplane instructions



Sophia and Madeline with IEEE presenter, Tom Bishop



Paper airplane concepts are investigated



Tisha, Brant, Sophia and Madeline Gaumer



Sophia & Madeline with silly putty



Warren Robotics Team 829 wins Essay Contest for IndianaFIRST FRC Teams



Central Indiana Section of the IEEE sponsored an Essay Contest for eligible IndianaFIRST FRC Teams. Warren Robotics Team 829 submitted the winning essay. Their winning essay appears below.

In this year's 2007 FRC robot, Warren Robotics Team 829 felt it necessary for success to have not only a functional arm, but also one that would work well at a variety of tasks. The name of the game for this year is "Rack N' Roll", and requires robots to place rings around "Spider Legs" for points. A team can also focus, however, on taking off rings to take points away from other teams. Thus, the importance of having a strong and well thought out arm is vital. In order to do this the mentors of Team 829 decided to make a challenge for all participants in Team 829, both kids and adults. They challenged us to make an arm, built only of supplied materials that fit the specifications given by an "employer". Throughout this challenge there were a variety of practices and standards both created by and used by the IEEE organization that was vital to completing this task.

This challenge issued by our mentors was in fact an IEEE lesson. The lesson was titled "Build Your Own Robotic Arm" and can be found on the tryengineering.org website. The standards for this activity come from the IEEE organization and come from a variety of fields, both academic and technological in origin. The idea of the activity was to focus on the creativity while mixing ideas of math and practicality. This was key to the success of our actual robot arm in a variety of ways. It was first based off a set of changing standards to suit an "employer" which allowed us to be prepared for the stress of rules for the coming season. Another asset that the activity provided for us is an abundance of useful and productive ideas for the brainstorms sessions coming up the following week. The robotic arm challenge put everyone into the thinking mode required for eventual success in the coming season for FIRST. Our eventual robotic arm idea was based off the winning design from our mentor's challenge and is going to play a key role in our robot.

Our software team was also a big part of incorporating IEEE standards into our 2007 robot. When the beginning of our season started, the software team decided on rather than creating a new drive system for our robot, recycling bits of programming from years past. This turned out to be a more daunting task than what was originally thought and required going through many hours of programming in order to find out what performed accurately and what needed to be modified or erased completely. In order to achieve this within a reasonable amount of time, we began a process of going through, and individually testing the old programming. This was beneficial because the 2005 robot we were testing from also utilized an arm in its use. As we went through testing, we took what parts of program were both correct and efficient. In our research for this essay, we found that the tests the programming team used to make its arm for this year corresponds with one of IEEE standards. The IEEE standard for Software Test Documentation was the standard that we found correlated with what our programming team did at the beginning of the season. Not only did this save our programming team time, but allowed for a more well rounded robot that functioned more ideally overall.

The programming team was not the only ones in accordance with IEEE standards; our electrical team also used multiple standards for the 2007 year. In accordance with IEEE safety standards the electrical team used red/black wires in order to correctly and safely label currents for the robot. This played a big part in not only safety for the people around the robot, but also to make sure nothing dangerous was mixed up on the robot, and to make sure each current was correctly identified. The electrical team also took a step into unknown territory this year in terms of IEEE standards by not only designing their own circuit boards, but etching them themselves too.



WARREN ROBOTICS

Warren Robotics Association - Walker Career Center - 9651 East 21st Street - Indianapolis, Indiana - 46229

Press Release

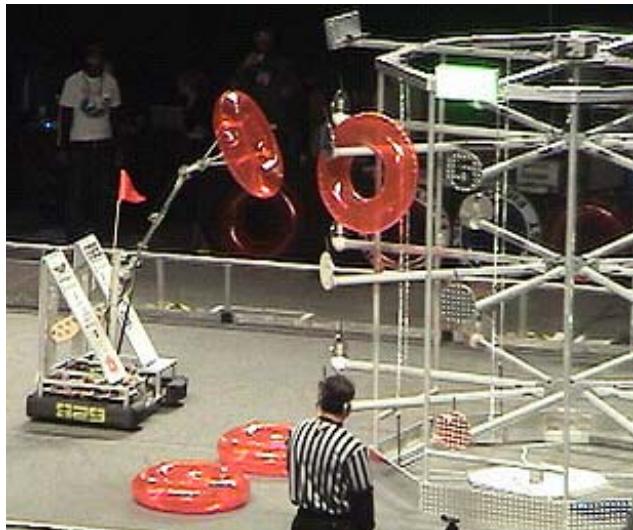
Warren Robotics Team #829 "Digital Goats" 2007 St. Louis Regional Winner!!

Saturday March 3rd, Warren Robotics Team "Digital Goats" #829 (Indianapolis, IN) along with alliance partners TechnoKats #45 (Kokomo, IN) and Lightning Lancers #1444 (St. Louis, MO) were winners of the FIRST St. Louis Regional.

The FIRST program is a competitive robotics program aimed at inspiring students in careers fields of science, engineering and technology.



(FIRST) an acronym: For Inspiration and Recognition of Science and Technology program has been called one of the best partnership building activities between high schools and local businesses in the U.S. today. What the competition requires is for local high schools to partner with companies that have engineers that will work with students to design and construct a robot that can perform functions pertaining to a certain game which is laid out by the FIRST organization.

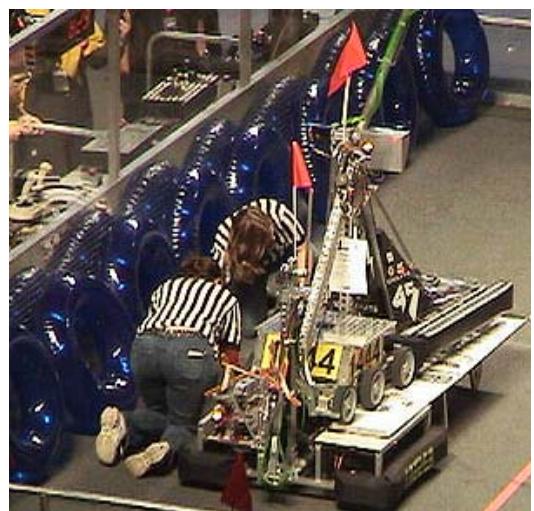
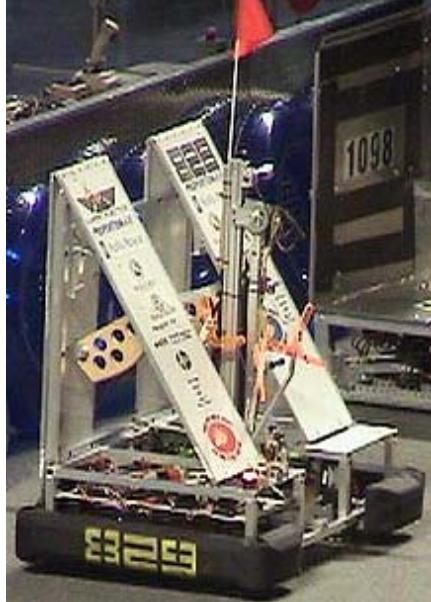


This years' competition entitled Rack 'n' Roll consists of two alliances composed of three teams each. Alliances can earn points by placing pool inner tubes on an octagonal structure called a "rack" and having robots in their home zone and not in contact with the playing field at the end of the match. Points are awarded based on the number and length of horizontal and vertical rows of scored spider legs on the rack. There are three rows of spider legs on the rack. One tube is 2 points, another next to the first is a total of 4 points, another next to the first two doubles the score, etc. Robots score bonus points at the end of the match if they are entirely in their home zone and not in contact with any element of the field. Robots 4 – 11.9 inches above the field each score 15 bonus points. Robots 12 inches or more each score 30 bonus points.

Warren's robot named "Randy" strong feature was its ramp, which had the capability of raising up to two robots 12 inches above the playing field. The robot also has an arm with a gripper for hanging tubes on the rack.

During alliance picking, the number two-team alliance picked us to help them out. Our alliance had two tube scorers and a ramp scorer. After two quarter and two semi final rounds, our alliance made it to the finals. Throughout the elimination rounds our robot performed perfectly and raised our alliances robots 12 inches above the playing field every time. Since it was double elimination we had to beat the other alliance twice to take home the trophy. With a score of 66 to 16 in the second match of the final round our alliance became the FRC St. Louis Regional champions

Warren Robotics (continued)



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Successful TISP Given at Pike High School

On April 18th, a successful Teacher's InService Program (TISP) was held at the Pike HS Freshmen center as part of an in-service training day for Pike Township. A group of middle-school science and math teachers who attended enjoyed the Candy Bag experiment and received materials for a number of other lessons. The group was very complimentary about the program. Many thanks to the CIS volunteers who made it happen -- Brad Snodgrass, Matt Schantz, and Will Kassebaum. We plan to continue working with Pike Township and hope to take part in training days in the fall.

Power Engineering Society / Industrial Applications Society Annual Student Awards Banquet

Submitted by Earl Hill, Chairman, PES/IAS

The PES/IAS held its annual student awards banquet on April 24th, at the IPL Safety Room. The event consisted of two speaker that discussed aspects of the future of the electrical power industry, followed by presentation of awards to students by Professor Fred Brockhurst.

The first speaker was Mr. Dave Sandifur, Vice President, Power Supply, at Hoosier Energy, Bloomington, Indiana. Dave spoke on the challenges facing the industry, including new sources of generation, limitations on transmission, and new regulations. Mr. Sandifur was followed by Mr. Brandon Seitz, of the Indiana Office and Energy and Defense. Mr. Seitz spoke on some of the initiatives the state of Indiana is spearheading to both improve the use of renewable energy and clean coal, and to promote business development here in Indiana.

Dr. Brockhurst then presented awards to the following students:

STUDENTS	College
Joshua Masquelier	IUPUI
Tung Nguyen	Rose-Hulman
Scott Stanley	IUPUI
Matthew Swanson	Rose-Hulman
Tim Hachfeld	Rose-Hulman
Jason Hartwell	Purdue
Bob Gray	IUPUI
Brent Piszro	Purdue
Kail Keusch	Rose-Hulman



Jason Hartwell – Purdue (Project Award)



Bob Gray – IUPUI (Junior Award)



Joshua Masquelier- IUPUI (Senior Award)



Brent Piszro – Purdue (ECET Junior Award)



Tim Hachfeld – Rose-Hulman (Junior Award)

Tung Nguyen & Matthew Swanson
Rose-Hulman (Project Award)

Tung Nguyen – Rose-Hulman (Senior Award)



Scott Stanley – IUPUI (Project Award)

The event included another fine meal catered by IP&L. The meeting was well attended. The PES/IAS thanks everyone who participated.

**Power Engineering Society / Industrial Applications Society
Arc Flash Seminar**

Submitted by Earl Hill, Chairman, PES/IAS

The PES/IAS presented a seminar on Arc Flash on May 15th, 2007, at the IPL Safety Room. The talk consisted of two presentations: one by Mr. John Klingler, of Klingler Electrical Safety, LLC, and one by Professor Fred Brockhurst, Rose Hulman (emeritus).

Arc flash is the release of energy that occurs when electrical equipment fails to insulate. The federal government (through OSHA) "suggests" that companies follow National Fire Protection Association (NFPA) Standard 70E, which contains guidance on avoiding and protecting against arc flash. Following an incident in 1999 at Ford Motor Company, in which two individuals were severely burned, many companies across America decided to implement NFPA70E.

Mr. Klingler and Professor Brockhurst work together in training company personnel on the NFPA70E and in designing protection programs. Mr. Klingler covered many of the regulator aspects of Arc Flash, while Professor Brockhurst discussed the use of software to help resolve arc flash concerns (such as changing out equipment, etc.). The talk was well attended.

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**Power Engineering Society / Industrial Applications Society
Spring Short Course Summary**

Submitted by Earl Hill, Chairman, PES/IAS

The PES/IAS has been busy over the last few months. Our first activity was the annual Spring Short Course, conducted in March 2007. The course was titled: "Power System Fundamentals", and consisted of five lectures by the following Rose Hulman professors: Fred Brockhurst (professor emeritus), Niusha Rostamkolai, and Cliff Griggs. The following topics were covered: , Circuit Analysis, Per-Unit System and Transformers; o Power Flow; Fault Analysis; Protection; and Stability. The overall goal of the course was to reacquaint participants in the fundaments of power engineering. Each session lasted about 2 ½ hours, and was held at the Indianapolis Power & Light Safety Room, at the IPL Morris Street facility. The course was very well received - about 35 members of the section attended. The PES/IAS plans another short course for the October / November time frame.

**Power Engineering Society / Industrial Applications Society
Arc Flash – Fred Brockhurst, instructor; May 15th, 2007**

"An arc flash is a short circuit through the air. When insulation or isolation between electrified conductors is breached or can no longer withstand the applied voltage, an arc flash occurs. As employees work on or near energized conductors or circuits, movement near or contact with the equipment, or a failure of the equipment, may cause a phase-to-ground and/or a phase-to-phase fault. Companies cannot afford to ignore the safety issues surrounding arc flash explosions, as the Occupational Safety & Health Administration (OSHA) enforces new standards for employee safety protection in potential arc flash situations". (Maintenance Technology magazine). This seminar was originally offered in February, but was snowed out and had to be rescheduled. Dr. Brockhurst will present this seminar at the Indianapolis Power & Light Safety Room, at the IPL Morris Street facility. Contact any PES/IAS member for directions.

Future Activities

PES/IAS Planning Meeting – June 5th, 2007

In this meeting, the Planning committee will identify and schedule activities through 2008. All members of PES/IAS are encouraged to attend and to provide input. Our goal is to provide a solid schedule of interesting and valuable events for the next 1.5 years. This schedule will be added to the CIS-IEEE website to make it easy for members to plan to attend.

Power Engineering Society / Industrial Applications Society Autumn Short Course

The fall short course will be on “Predictive Maintenance for Power Delivery Equipment”. This course will provide four sessions, devoted to the following topics:

- Dissolved oil in gas analysis
- Breaker testing
- Transformer Testing
- Oil analysis – including corrosive sulfur issues.

The course will be held at the IPL Safety Room, from mid-October to mid-November. More details on the short course will be made available following the June Planning Meeting.

* * *

CIS - IEEE Scholarship Award

Every year, the central Indiana section of the IEEE funds scholarship to IEEE student members at universities in the sections area. Last year, one of the awardees was Russell Jackson from Rose Hulman University.



Russell Jackson accepting the IEEE scholarship check from Dr. Berry, head of the Electrical and Computer Engineering department, Rose Hulman University.

Free Membership Offer from the IEEE Communications Society

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As a Communications Society member, you will receive monthly issues of IEEE Communications Magazine, electronic access to past issues, and the CommOntology (a search engine that eases access to get information through topical queries) on the Communications Society Web site. I hope you will join the Communications Society at: <http://www.comsoc.org/freeoffer>. This free introductory offer is limited to select IEEE members only. Please respond by 15 June 2007

Nim Cheung, President, IEEE Communications Society, www.comsoc.org

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Central Indiana Engineering Consultants' Network (CIECN)

Steering Committee: Earl Hill, Will Kassebaum,
Duane Mattern, Richard Pfile, Brooks Reed, Ken Shafer

On May 2nd, CIECN met at the Purdue Office of Engagement - Indianapolis, in Intech Park. Tom Carroll is the director of the office and he introduced Vic Lechtenberg, Vice Provost for Engagement, David McKinnis and David Snow. The Office of Engagement is tasked with improving economic development, enhancing K-12 education, and promoting service learning and life-long education in the state of Indiana. David McKinnis talked about the Technical Assistance Program (TAP) and David Snow talked about the Manufacturing Extension Partnership. The presentation material is largely online at the following links:

http://www2.itap.purdue.edu/bot/memberDocuments/StatedMeetingFiles/Governance_Report_Engagement_Feb06_ppt.pdf
http://www.ces.purdue.edu/LCD/11-1-04_Extension.pdf
http://www.tap.purdue.edu/manufacturing_assistance/products_services/Broch_Opportunities.pdf

On April 5, CIECN met at IUPUI. The talk was entitled, "Intellectual Property and Related Contract Issues for Small Businesses" and was presented by Tom Walsh and Gregory Duff of Ice Miller, LLP. Patents and liabilities issues in contracts were discussed.

**CIS-IEEE visits Anderson Flagship Enterprise Center
and Altairnano Research Facility**

On March 22, twenty members of IEEE visited the Flagship Enterprise Center and Ms. Christine Dalgren, Business Manager for a briefing on the facility's history and function. The facility is an Indiana certified technology park located in Anderson, Indiana and a partnership between the City of Anderson and Anderson University. It serves as a business incubator for entrepreneurial ventures (see www.flagshipentreprise.org for details).

Following the briefing, we heard from a prominent member of the center, Altairnano Research Facility and Mr. David Lynch the manager of the facility. Altairnano performs research, development, testing and small scale manufacturing of battery packs for high amperage applications. This includes vehicles and backup power applications. The batteries they are currently developing utilize nLTO, or nano Lithium Titanate Oxide in the anode, and LMO- Lithium Manganate Oxide in the cathode. They are building battery packs for an EV application for Phoenix Motorcars in Ontario, CA, as well as samples for many other prospective customers- in both cell form and battery module/pack form. Bruce Lasley graciously led the plant tour and also answered questions from the attendees.

Following the tour and questions, the CIS executive committee and some of our members remained in the facilities meeting room for an executive committee meeting. This is part of an initiative this year to hold our meetings in various locations throughout our section so that more of our members will have an opportunity to participate.

Special thanks go to our IEEE member Dick Hildreth for planning the evening's activities. Thanks also to the center, Ms. Dalgren, Altairnano, Mr. Lynch and Mr. Lasley for all the hospitality. All the participants enjoyed the event and many found the information and tour to be very informative. One attendee was surprised that such activities were going on in our area and the fact that the Altairnano production room had to be kept to <1% humidity interesting as well as the fact that they are basically running production in an engineering environment. Also impressive was the presence of much ad hoc and custom tooling. It seemed like their technology is superior in many ways and as they mentioned, the battery assembly process could be automated eventually leading to a local manufacturing capability.

Thomas N. Bishop, PE
Vice Chair 2007
CIS-IEEE

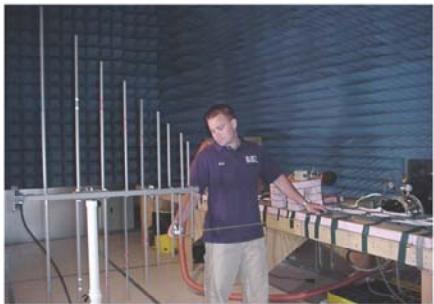
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Indiana Council on Engineering Societies (ICES)

On May 3, the first in-person meeting of a new group, tentatively named the Indiana Council of Engineering Societies (ICES), was held in the training facility at Rolls-Royce. Representatives from a number of engineering societies were either present or attended the meeting via a dial-in line, including: Society of Women Engineers (SWE); National Society of Black Engineers (NSBE); American Institute of Aeronautics and Astronautics (AIAA); Institute of Electrical and Electronics Engineers (IEEE); American Society of Civil Engineers (ASCE); Society of Hispanic Professional Engineers (SHPE); American Institute of Chemical Engineers (AIChE), Society of Automotive Engineers (SAE), American Society of Mechanical Engineers, and Scientech. The group is just getting started, but the goal is to interact on common interest. Thanks to Charity Nowling and Holly Wilcox of SWE for getting this group off the ground. If you would like to get involved with this group, contact the office in your respective societies.

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In 2005, fifteen firms providing services for the new Indianapolis Airport decided it was time to bring the ACE Mentor program to Indiana. Working with students from Northwest High School and George Washington Community School, mentors planned exercises that taught the students to solve problems just as they do. These exercises assisted the students as they designed a fictitious "Concourse C" and presented their projects to over 160 construction industry professionals at a Scholarship Dinner held in May of 2006 – a dinner which featured the award of \$20,000 in scholarships.

Nineteen students completed the inaugural year of the ACE Mentor Program in Indiana. Six students were awarded scholarships. Seniors Justin Matteson and Doug Smotherman from Washington Community School and Michel Ovando and Ismael Garcia of Northwest High School were each awarded scholarships in the amount of \$4,000. All four seniors have entered college with three of the students attending IUPUI. Additionally two juniors were awarded scholarships in the amount of \$2,000. Those students were Britney Keller from Washington and Brandon Powe from Northwest.

2006 Scholarships were funded through proceeds raised from the scholarship dinner. Four firms provided named scholarships through the donation of \$4,000. Those firms included ARCHonsortium, Fink Roberts and Petrie, Shrewsberry & Associates and Turner Construction Company.

For more information, see: <http://www.acementor.org>

ACE Mentor Program

<http://www.acementor.org>

The ACE Mentor Program serves high school youth who are exploring careers in Architecture, Construction, or Engineering. The mentors are professionals from leading design and construction firms who volunteer their time and energy. The program is designed to engage, inform, and challenge youth.

Since the ACE Mentor Program was launched in New York City in 1991, it has become the construction industry's premier workforce advocacy and school outreach initiative. The program is run by a non-profit coalition of professionals working together to excite and motivate young people to pursue careers in Architecture, Construction and Engineering and it is growing. ACE Affiliates now operate in 86 cities involving more than 150 after-school activity teams and 5,500 students.

The mission of the ACE Mentor Program is twofold: 1) to enlighten and motivate students toward architecture, construction, engineering, and related careers; 2) To provide mentoring opportunities for future designers and constructors.

CIS-IEEE PACE
"Stuff You Don't Learn in Engineering School"
Carl Selinger

On Saturday April 21, CIS IEEE hosted Carl Selinger for a Professional Activities Committees for Engineers (PACE) event. The seminar was presented by Carl Selinger, independent consultant on April 21, 07 at IUPUI campus. The seminar was attended by number of Engineers with various backgrounds. Carl Selinger is a very effective speaker and there was a lot attendees' participation during the seminar. Carl was asked by the section to bring copies of his book which were signed By Carl for those attendees who purchased them. The seminar was received very well and overall attendee's feedback was very positive. For more background information, see his website at: <http://www.carlselinger.com>



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Recent Senior Members

Congratulations to Euvaldo Ferreira Cabral, Jr. for reaching senior member status this year.

Central Indiana Engineering Web Links

ACEC	American Council of Engineering Companies, Indiana	acecindiana.org
ASCE	American Society of Civil Engineers	sections.asce.org/indiana
ASME	American Society of Mechanical Engineers	http://sections.asme.org/central_indiana/
ASM-INDY	American Society for Metals - Indianapolis	asm-indy.org
CINLUG	Central Indiana Linux Users Group	cinlug.org
IBEN	Indiana Biomedical Entrepreneur Network	indianabionetwork.org
IHIF	Indiana Health Industry Forum	ihif.org
INDSPE	Indiana Society of Professional Engineers	indspe.org
INDYASHRAE	American Society of Heating, Refrigeration, and Air conditioning Engineers	indyashrae.org
NSBE-IAE	National Society of Black Engineers - Indianapolis Alumni Extension	nsbe-iae.org
PIMCIC	Project Management Institute - Central Indiana Chapter	pmicic.org
SAE	Society of Automotive Engineers, Indianapolis	http://www.saesections.org/indiana/
Scientech	Scientech Club in Indianapolis,	scientechclub.org
SIM	Indianapolis Chapter of Society for Information Management (SIM)	SimNet.org
SWE-CI	Society of Women Engineers - Central Indiana Section	swe-ci.com
Techpoint	A diverse collection of technology-based Indiana industries.	Techpoint.org

Central Indiana IEEE Related Web Links

CIECN	Central Indiana Engineering Consultants Network	Indy-engineer.net
Student Sections	Rose Hulman Institute of Technology	http://www.rose-hulman.edu/Users/groups/IEEE/
	Purdue University, West Lafayette	purdueieee.org
	Indiana University/Purdue University at Indianapolis	iupuiieee.org ???

2007 Meeting Calendar

Date	Host	Subject	Location
June 2-3	ASMS	Mass Spectrometry Short Courses	Indianapolis, IN
June 3 - 7	ASMS	55th ASMS Conference on Mass Spectrometry	Indianapolis, IN
June 5	PES/IAS	PES/IAS Planning Meeting	Indianapolis, IN
July 13-15	Phi Sigma Rho	Convention 2007, Hyatt Regency	Indianapolis, IN
Augl. 24	CIS-IEEE	Annual baseball game and picnic at Victory Field	Indianapolis, IN
Nov. 1-4		10 th Annual Colloquium on International Engineering Education at Purdue University	West Lafayette, IN
Nov. 7	CIS-IEEE	Annual Banquet, Gerald Jakubowski of Rose-Hulman Institute of Technology will be the Key-Note Speaker	Indianapolis, IN

 Check the [Section web page](#) for current information. 

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