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THE SUNCOAST SIGNAL

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

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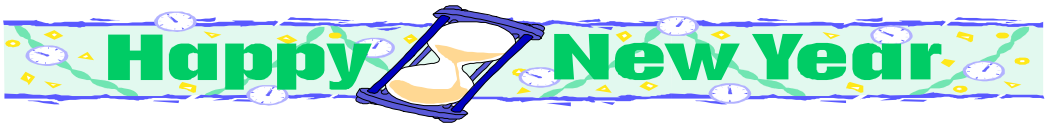
Inside This Signal…



This Month's Meetings

January 5th: EXCOM Meeting
Meeting starts at 5:30PM At TECO Plaza
Register online at http://time2meet.com/fwcs-excom/index.html

Meeting is open to all FWCS Members

Tour of USS American Victory

Tuesday, January 12, 2010
705 Channelside Drive, Behind the Florida Aquarium
Tampa, FL. 33602
See Page 6
Register Online at: http://time2meet.com/fwcs-pes4/index.html

Upcoming Events!

Tampa Bay Engineers Week Banquet

February 19, 2010 at MOSI
Details on page 5!

Rockwell Automation Seminar

Event will begin in February and will be a three part series. See page 7

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This Month…(Editor's Column)

It appears that 2010 will be bringing a new opportunity for me. Jim Anderson had just completed a three year commitment to the Institute Editorial Advisory Board and was asked to suggest a replacement. He contacted me and encouraged me to apply and I was selected! I am looking forward to serving on the board and having the opportunity to get a glimpse of upcoming articles and to have a little input into what gets published. I will also be a source for local events that might be of interest to the Institute.
This month we have an article on Photonics from a first time contributor, Wing-Ying Kwong and an announcement of a tour of the American Victory ship docked near the Aquarium. The dates for the Engineering Banquet have been announced on the front page with details next month. Valerie Tur, the WIE Chair will be presenting a series of seminars on automation starting in February and details will be forthcoming next month. Happy New Year!

IEEE-USA IN THE NEWS

Fourth E-Book in IEEE-USA Innovation Series Released

WASHINGTON (15 December 2009) -- Complete your set in IEEE-USA's e-book series on innovation with the fourth and final e-book, "What it Takes To Be an Innovator." In his latest book, author Gus Gaynor "discusses the critical element in innovation -- the innovator." He provides a picture of what an innovator could -- and should -- bring to an organization, including characteristics and attitudes, and discusses some famous innovators. Book 1: "Perspectives on Innovation," gave an understanding of what innovation involves and how it takes place. Book 2: "Developing a Workable Innovation Process," focused on the innovation process -- with emphasis on designing the innovation process from a systems perspective. Book 3: "Fostering an Innovation Culture" provided the fundamentals for developing a culture that supports innovation.

You can purchase your copy of "Doing Innovation: Creating Economic Value -- Book 4: What it Takes To Be an Innovator" at www.ieeeusa.org/communications/ebooks for the IEEE member price: $9.95. The nonmember price is $19.95. IEEE members can purchase other IEEE-USA E-Books at deeply discounted prices -- and download some free e-books. To purchase IEEE members-only products and receive the member discount on eligible products, members must log in with their IEEE Web account.

IEEE-USA advances the public good and promotes the careers and public policy interests of more than 210,000 engineers, scientists and allied professionals who are U.S. members of IEEE. IEEE-USA is part of IEEE, the world's largest technical professional society with 375,000 members in 160 countries. See http://www.ieeeusa.org.

Contact: Sharon Richardson
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IEEE

IEEE Congratulates Our 302 New Senior Members!

Please note that this total includes recently approved applications reviewed by the Appeal Committee. The last A&A Review Panel meeting was held on **21 November 2009 in** New Brunswick, New Jersey. Charles E Hickman, Chair of the A&A Committee, would like to thank the panel of Senior Members and Fellows from the North Jersey and Princeton Central Jersey Sections who took part in the review process. The report can be accessed online soon from the Senior Member Update Web page at: http://www.ieee.org/web/membership/senior-members/updates.html. The next IEEE Senior Member Review Panel Meeting will be held on **9 January 2010, in San Diego, CA.** To report any corrections to the information posted, please contact Denise Maestri at d.maestri@ieee.org.

IEEE

Photonics for Our Daily Life

With the category of the 2009 Nobel Physics prize being "light", it is apparent that photonics has become an indispensable technology to be applied in nearly every, if not all, industry, allowing us to have better, safer and healthier living.

In telecommunications, massive amounts of data or messages, be they text, images or voice, are converted into light-waves by transmitting devices before being sent to every corner of the world through optical fibers in space or under water. These messages are then received instantly by receiving devices that convert light-waves back to electronic signals to be processed. The total operating energy of such a communication system is lower and the system performance is superior.

For image data, a charge-coupled device (CCD), a digital image sensor, converts the optical image into electronic signals in digital form and the image can subsequently be reconstructed by devices, such as computers. The CCD has become the technology of our everyday digital photographic cameras. In the medical imaging industry, the CCD technology allows imaging capabilities to go beyond traditionally inaccessible medical settings. Whether for health monitoring, disease detection or surgical procedures, this CCD technology can improve the quality of life for many people. In observatories, remote sensing satellites collect image data of the Earth for surveillance and understanding global climate changes that may impact human activities, such as the change in ice covers and sea –level and –surface temperatures, allowing us to make preventive means. These satellites can also monitor for natural disasters, homeland security and agriculture. For our health, satellite-collected data can be used to foresee warming trends and when an epidemic will break out in which affected areas, so that precautionary measures may be taken. Whether in space or on ground, photonics technologies can be used to reduce air pollution and consequently, lower related costs.

In optical farming and food processing, photonics help to determine the health of soil, nutrient content, when to harvest and the hydrology of agricultural areas and to screen for bacterial contaminants in food. Nobel silk optics may also be used to detect the presence of bacteria in food products. Crop health can be measured by fiber optics, which is less destructive to crops. All of these ensure that food, drinks and pharmaceuticals are safe for us consumers. Our daily drinking water, is treated with, or disinfected by, ultraviolet-light radiation that can kill germs in the usual chlorinated water, ensuring us a safer drinking water. This treatment only requires a low-energy input. In the solar energy industry, solar photovoltaic systems can capture direct sunlight and generate solar electricity, an alternative energy, by converting sunlight in the system. This way, better energy efficiencies can be obtained. Thus, it will be more energy-efficient if our houses consume solar thermal energy. In the automotive world, cameras and sensors can be used to improve auto safety by detecting nearby objects, such as cars, pedestrians and animals, which may cause a hazard and send out warnings to drivers. These cameras and sensors can also help drivers in parking and to see blind-spots.

All of the above are just a few applications of the photonics technology that had revolutionized our living.

Wing-Ying Kwong, IEEE Senior Member

IEEE emeritbages.org Updates Website

The IEEE emeritbadges.org project has updated its web site, http://www.emeritbadges.org, featuring hands-on, pre-college technology educational materials for boys and girls. The updated site will feature information on the program's sponsorship of the Electricity and Electronics Merit Badge booths at the 2010 National Scout Jamboree, to be held from 26 July to 4 August, 2010, at Fort A.P. Hill, in Caroline County, Virginia

To foster an interest in the engineering profession, IEEE serves students, members and colleges around the world. IEEE realizes that high school student exposure to the accomplishments of engineers is critical to increase engineering enrollment significantly at the university level. Thus, the IEEE created and sponsors the IEEE Scouting program, primarily through the Boy Scout organization and local Girl Scout groups. The program is designed to reach pre-university students and educators to "enhance the level of technological literacy of pre-university educators and students worldwide."

Similar to its counterpart, the IEEE GirlsGoEngineering.org mission is to energize girls toward careers in engineering, mathematics, and the physical sciences. A major component is a volunteer developed and run website, www.GirlsGoEngineering.org, which provides science and engineering career and instructional programs, activities, materials and web resources of interest to girls, educators, and adult leaders. Other planned activities include participation in Girl Scout events and similar organizations to enlighten girls about careers in science and engineering.

Thanks,

Ralph W. Russell, II, Chair, IEEE Scouting Program

Brain Teaser Challenge Solution - October 2009

Butch Shadwell

Measurements can be difficult. "… using a multimeter rated at 1000 ohms per volt, set on the 10 volt range, what voltage would I read from the dial if I measured the voltage at the middle node of a voltage divider composed of two 10,000 ohm resistors in series, across a solid 5 volt DC supply? Later I bought a VTVM or vacuum tube volt meter, with a fixed input resistance of 11 megohms."

Many students I meet, and some MS and PhDs as well, sometimes forget that whenever you measure something you have to take some energy from it. Measurement requires interaction with the phenomenon of interest. Before the advent of solid state electronics, portable meters had to function without the benefit of high input impedance amplification. The vacuum tube volt meters discussed last month required connection to the mains and so were considered a bench based measuring technology. There were several correct answers sent in this month. Adding the meter to the circuit changed the resistor divider from ½ to 1/3 of the 5 volt supply, and that is what would have been seen on the dial. With the VTVM the error would have been less than 1%, assuming the meter had that degree of accuracy in the display (which of course they did not). With these analog meters you rarely got more than two significant digits from the reading. Some of you may remember tapping the meter face trying to get it to settle at the right value.

Brain Teaser Challenge – November 2009

Fred Jones was in his last term as an EE undergrad at Whatsamatter U. For his senior project he decided to build a codec that would send 8 bit PCM audio at 2.5 kilobytes per second. It seemed to work pretty well on most male voices, but there was weird distortion with music and some women. Fred may have fallen asleep in his DSP class. What do you think could be his problem? Fred often preferred to be called Stanley Smith for some odd reason, but I am not sure why I am telling you his alternate identification. I have to stop with the clues.

Reply to Butch Shadwell at b.shadwell@ieee.org (email), 904-410-9751 (fax), 904-410-9750 (v), 3308 Queen Palm Dr., Jacksonville, FL 32250-2328. (http://www.shadtechserv.com) The names of correct respondents may be mentioned in the solution column.

IEEE

Tampa Bay Engineers Week at MOSI

The annual Tampa Bay Engineers Week Banquet will be held on the evening of Friday, February 19, 2010, at MOSI. For the first time, the Tampa Bay Engineers Week Banquet Committee is facilitating an Outreach Project in conjunction with the event. We are working with MOSI to help develop initial research for an Energy Center at the Science Center.

The Tampa Bay Engineers Week Banquet is an event that people will be talking about for months to follow. At the banquet, the findings from the Outreach project on the different forms of energy and alternative energy will be unveiled for the first to the public. Additionally, awards will be presented to outstanding engineers in each discipline, as well as local engineering students excelling in their engineering related studies. The banquet also features the Lignell Awards. These awards, named after a former Chairman for the Institute of Electrical and Electronics Engineers (IEEE), are given to local High School educators who are performing outstanding work in the instruction of the STEM topics (science, technology, engineering and math). The organizers of the event recognize the important role these individuals play in encouraging students to pursue technological degrees in college.

Where: MOSI 4801 E Fowler Ave, Tampa, Florida, 33617
Time: Vendor Expo and Cocktail Reception (Cash Bar) 5:30pm – 7:00pm Dinner, Speaker, Awards 7:00pm
Cost: $55 per person

For more information visit http://www.tbewb.org/

Serge Beauzile

IEEE

Tour of SS American Victory Ship

Date: **Tuesday, January 12, 2010**
Time: **5:30 PM**
Cost: **$10 Members, $15 Non-Members**
Make checks payable to IEEE FWCS and mail a check in advance to IEEE PE/IA Chapter Treasurer: John Stankowich,
2593 Forest Run Court,
Clearwater, FL 33761-3716.
Speakers: **Bill Kuzmick, Museum Director**
Location: **705 Channelside Drive, Tampa, FL 33602,**
Behind the Florida Aquarium
Parking: **Free, on the pier alongside the ship. As you go around the traffic circle in front of the aquarium take the first right turn after the aquarium and follow the signs to the Victory Ship.**
RSVP: **Online at: http://time2meet.com/fwcs-pes4/index.html**
Space limited to the first 20 registrants!!!
Questions: **John Luce at 813-925-3487 or jwluce@ieee.org**

During World War II, most of the supplies for our armed forces were carried by 2710 Liberty class ships and 534 Victory class ships.

These were merchant ships operated by the merchant marine although they carried a small contingent of Navy men to man the guns. The merchant marine suffered a higher percentage of casualties than any of the armed forces.

The 11 knot Liberty ships were slow and vulnerable to submarine attack and the later Victory ships, though about the same capacity were 50% faster and comparatively few were lost to submarines.

The American Victory is 455 feet long, displaces 15,200 tons and carries fuel for 24,000 miles. Her propulsion is a 6000 horsepower cross compound condensing steam turbine. (The Liberty ships had a 2500 horsepower triple expansion reciprocating engine.) Her electrical system is 110 / 220 volts DC. The motor controls are all resistive. Now that she is moored as a museum, AC shore power has been added, but the original DC system is largely intact. She is still maintained in sailing condition.

Many of the Victory ships were named for Universities and this one was named for American University in Washington, D.C.

This tour will include the engine room and we will be going into hazardous areas not open to the general public. There are no ramps or elevators, the ladders (stairways) are very steep and there will be a lot of climbing. Wear secure shoes, preferably with rubber soles.

Cameras are permitted but keep both hands free for the handrails on the ladders

Teacher In Service

Dear Prospective Science Fair Judge:

The Hillsborough County School Board and the Florida Foundation for Future Scientists extend a cordial invitation to you to serve as a judge for the Junior/Senior division of the 30th Annual Hillsborough Regional Science and Engineering Fair. The 2010 Regional Fair once again will be held at the USF Sun Dome for all grades K-12 on February 24 and 25, 2010. Judging for Junior/Senior Division will occur on Wednesday, February 24 between the hours of noon and 4:00 p.m.

The projects at the Regional Fair represent students' work which placed in a school Science Fair. These students are looking forward to the regional competition, and appreciate the time and effort each person donates to make it a success. We are expecting approximately 300 projects in grades 6 through 12 from over 70 public and private Hillsborough County Middle and Secondary schools.

As you know, judges are the most important factor in a successful Regional Fair because judging is the fundamental learning experience for our student participants. We hope you can help us provide a quality experience for our young people by donating your time and expertise in this worthwhile endeavor during the afternoon of February 24, 2009. Your help as a Regional Judge will assist us to select twenty-six students who will represent Hillsborough County in the 2010 State Science Fair in April, in Lakeland where over $200,000 worth of scholarships and awards will be given.

The organizational meeting on Wednesday, February 24th for Junior or Senior Division Judges (Grades 6-12) will begin at approximately 11:00 a.m. A light lunch will be served at 11:30 a.m. and projects will be judged from 12:00 noon to

4:00 p.m.

Please respond via IDEAS to Dena Pisaneschi by January 15, 2009, if you are willing to be one of our Regional judges on February 24th. If you have any questions or know of anyone else that would be a quality judge for this event, please call Dena Pisaneschi at (813) 558-1180 or email at dena.pisaneschi@sdhc.k12.fl.us **If you cannot participate this year, be sure to reply if you would like to be asked again next year.**

Sincerely,
Larry Plank,, Supervisor of Secondary Science
Andrea Ringer, Supervisor of Middle School Science
Dena M. Pisaneschi, Chairperson, Regional Junior/Senior Judging
Submitted by Sean Denny, Teacher In Service Chair

IEEE

Rockwell Automation Seminar

A Paradigm for Inside-Out Energy Management (three part series)

The following describes a paradigm that manufacturers can use to make the transformation from passive energy users to strategic managers of their energy resources. This takes an "inside-out" approach and enables manufacturers to use their existing automation and power control investments to begin saving energy more effectively, and investing it more intelligently.
The methodology comprises seven pillars of capability. A manufacturer can begin to build its foundation with any of these pillars, either independently or simultaneously. As with any structure, it becomes increasingly stable with each additional pillar of support that is incorporated into the overall energy management program, but the pillars do not have to be addressed sequentially. A blueprint – or what we refer to as the "**Greenprint**" – for achieving energy optimization is outlined below.
The 1st seminar will be in February, time and date to be announced.

Future seminars will feature **Infrastructure for Inside-Out Energy Management** and **Enabling the Smart Grid** as topics. Times and dates to be announced

Thanks,

Valerie L Tur, WIE, FWCS

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January 2010 Calendar of Events (For more information see P. 1) *inside this Signal…*

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
27	28	29	30	31	1 	2
3	4	5 *EXCOM Meeting at TECO Plaza*	6	7	8	9
10	11	12 *American Victory Ship Tour see page 6*	13	14	15	16
17	18	19	20	21	22	23
24 31	25	26	27	28	29	30