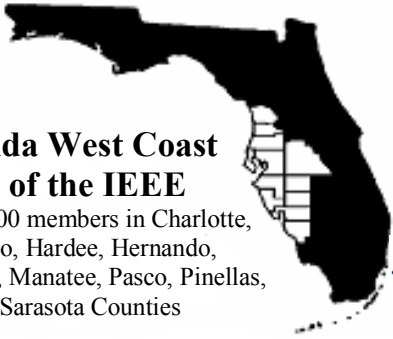


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Hillsborough, Lee, Manatee, Pasco, Pinellas,
Polk, and Sarasota Counties



THE SUNCOAST SIGNAL

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

Volume 50 — No. 10

<http://www.ieee.org/fwcs>

October 2007



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Life Members Meeting All IEEE Members Are Invited

Jack Killingsworth, IEEE Life Member, will discuss the work of the IEEE Standards Committee 38 on Electronic Voting Standards. Volunteers are needed to help study and report on Standards for Electronic Voting issues.

Please join local IEEE Life Members for lunch in the wine room at Tio Pepe's.

When: 12:30 PM Tuesday October 16, 2007

Where: 2930 Gulf To Bay Blvd Clearwater, FL

Cost: On your own; the menu runs \$8.00 to \$14.00 plus drinks

Please RSVP to Jack@JackKillingsworth.com or 727 596-1990 or register on line at Other Meetings/Section Meetings on <http://time2meet.com/fwcs-meetings/>



Seminar on IEEE 450 & 485 Standards on Batteries

Date / Time: October 19, 2007 Registration & Breakfast: 8:00AM - 8:30AM
Seminar: 8:30AM – 3:30PM (Lunch Included)

Speaker: Marco W. Migliaro – IEEE Fellow, President and CEO of IEEE Industry Standards & Technology Organization.

The objective of the Stationary Battery Seminar is to provide the participants with a basic knowledge of lead-acid and nickel-cadmium stationary batteries used in different applications. It will also provide the participants with the information necessary to select and size stationary batteries, as well as, discuss the recommendations for maintenance and testing of the batteries. For more see p. 6.



Don't Forget to Vote!

Our Needs (Editor's Column)

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Plain Talk about the Electric Power System

for the Non-Power Engineering Professional

October 17-19, 2007 at the St. Louis, Missouri Airport Hilton

IEEE PES is pleased to announce a series of courses that focus on the Electric Power System for the Non-Engineering Professional. The three areas covered are:

- Power System Basics—Understanding the Electric Utility Operation
- Delivering Power to the Customer—Today's Distribution System
- The Grid--The Interconnected Electric Bulk Power System

Register Today! See http://www.ieee-pes.org/vfvzttv_zvbsvvant.html for the Plain Talk Brochure and http://www.ieee-pes.org/cagobba_zvbsvvant.html to view the entire program and get registration details.

About once each week something occurs to remind me that there is an important weakness in the U.S. There is a short-fall between the need for skilled, knowledgeable engineers and their availability. This short-fall contributes to increased numbers (or pressure for increased numbers) of engineers with H1-B visas, that is, engineers from other countries. It results in the perception that businesses hire H1-Bs to reduce labor costs. And it contributes to the outsourcing of technical work to places such as India and Eastern Europe. I will not go into the numbers here, perhaps in another column.

The underlying cause, the shortage of skilled, knowledgeable engineers, is simply that there seems to be substantially fewer young people entering the engineering fields. College enrolments are down while the business needs are increasing.

On page 5 of this Signal, our Chair, Jim Anderson, proposes that the FWCS has developed a *de facto* mission: "To Share The Power Of Engineering Knowledge." The section is doing this through a group of initiatives in the primary and secondary schools that together can result in more of our youth going into the important technical areas.

To this I say, Hallelujah!

—PS



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**IEEE Technology-
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Aired in More Than
Two-Dozen U.S. TV Markets;
View Latest, Archived Spots**

Beginning in 2005, in collaboration with the American Institute of Physics (AIP) and other technical professional organizations, IEEE-USA has helped to underwrite almost 300 local television news stories on engineering and science.

Since January 2006, stories about IEEE-related technologies aired in more than two-dozen U.S. TV markets, including New York, Chicago, Philadelphia, San Francisco, Tampa-St. Petersburg, Phoenix and Miami -- broadcast on ABC, CBS, NBC, Fox, Univision, cable and independent TV affiliates. The average number of household views for these markets is estimated at more than 70 million.

Recent IEEE technology-related stories included: "Preparing for Disaster"; "Movie Magic"; "Engineers Invent Doppler-Based Stethoscope"; "RFID-based Recycling Technology Makes Philadelphia Greener"; and "Automotive Engineers Team Up to Improve Energy-Saving Technology."

The stories are aired as part of AIP's "Discoveries & Breakthroughs" news service that delivers a dozen vetted 90-second spots (in English and Spanish) to the top 66 television markets in the United States—with a potential reach of 75 million viewers.

A limited number of DVDs of the IEEE technology-related TV spots can be obtained by sending an e-mail to p.mccarter@ieee.org.

To view the latest 90-second stories as well as almost 100 archived spots—all on IEEE-related technologies, go to <http://www.aip.org/dbis/IEEE/>.

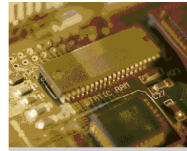
CONTACT: Pender M. McCarter, Senior Public Relations Counselor, IEEE-USA, +1 202 530 8353

IEEE-USA advances the public good and promotes the careers and public policy interests of more than 215,000 engineers, scientists and allied professionals who are U.S. members of the IEEE. IEEE-USA is part of the IEEE, the world's largest technical professional society with 370,000 members in 160 countries. See <http://www.ieeeusa.org>.



IEEE Seeks ABET Evaluators

IEEE, the largest member of ABET, Inc. is responsible for the peer-review evaluation of more than 700 college and university programs. To aid IEEE and ABET in its accreditation process, the IEEE Educational Activities Board (EAB) is seeking engineering professionals from industry, government and academe to serve as program evaluators. See <http://www.ieee.org/web/education/apc/ceaa/eacinfo.html>



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Plain Talk about the New Technologies

Registration Now Open!

For Power & Energy Professionals

The IEEE Power Engineering Society is pleased to offer a series of courses focused on "Plain Talk about the New Technologies" for the Electric Power System of the 21st Century for the Non-Engineering Professional.

The courses are scheduled for: November 6-8, 2007 in Arlington, Virginia:

- Day 1: New Generation Technologies
- Day 2: Transmission and Distribution Technologies
- Day 3: New Systems and Software Technologies for Planning, Operation and Control

Register Today!

Go to http://www.ieee-pes.org/wfgfqwq_loszoodgh.html to view the Plain Talk Technologies Brochure; see http://www.ieee-pes.org/yvjvfbf_loszoodgh.html for online registration.



Programmable Logic Users Group's Annual PL-UG Fest

November Chapter Event

Computer Society, AESS and PL-UG

Date/Time: Thursday, November 15, 2007, 8:30 AM to 4:30 PM

**Holiday Inn Select
3535 Ulmerton Road
Clearwater, FL 33762**

Please RSVP online at: <http://time2meet.com/fwcs-meetings/>

This is an annual event sponsored by the Florida West Coast Computer Society, the Aerospace & Electronic Systems Society (AESS) and the Programmable Logic Users Group (PL-UG).

PL-UG Fest is a full day of vendor and user presentations focused on embedded systems design with an emphasis on CPLD and FPGA technology.

This is an open meeting and there is no charge for attendees.

Non-members and students are welcome.

Lunch and snacks will be provided by the sponsoring vendors.

Previous vendors included AccelChip, Aldec, Altera, Avnet, Lattice Semiconductor, Marathon Sales, Memec/Insight, Mentor Graphics, Semtronic Associates, Siliconexion, Synopsys, Xilinx, EDA/Prover Technologies and others. **Also, new this year, several half-day training sessions are planned for the afternoon of Nov. 14.**

We expect these vendors and more to present in November. More information will appear in November IEEE Signal after confirmation and details on the presentations and the speakers. Companies wishing to participate in this year's PL-UG Fest can sign up on the PL-UG website (www.pl-ug.org) or call Jim Lumia at 813-832-3501.

This is a Joint Meeting with the Programmable Logic Users Group (www.pl-ug.org)



Concerns Regarding the Patent Reform act of 2007

The U.S. House of Representatives passed a flawed Bill last Friday that would radically change the Patent system in this country. The Patent Reform Act of 2007 contains several controversial provisions, including changing the U.S. Patent system from a "first-to-invent" standard to a "first-to-file" standard. This means that Patents would be awarded to the first person to file for a patent, not the first person to make the underlying invention.

Any IEEE member who is involved in creating or protecting intellectual property should be aware of this bill. Please help us spread the word by forwarding this message to your sections.

IEEE-USA has posted a Legislative Action Alert on Legislative

Action Center here: www.ieeeusa.org/policy/lac. We encourage all concerned IEEE members to visit to learn more about the bill and to contact their elected officials regarding it.

A letter expressing IEEE-USA's concerns can be found here: <http://www.ieeeusa.org/policy/policy/2007/082707.pdf>

Thank you for your help. This bill is expected to move very quickly in the Senate, so members who wish to express their opinions to Congress need to do so right away.

Russell T. Harrison, Senior Legislative Representative - Grassroots Affairs IEEE-USA (202) 530-8326



Arc Flash Study Development and Solutions

Date: Nov 2007, (watch registration page for date)

Time: Registration: 8:30AM – 9:00AM, Seminar 9:00AM – 2:00PM

Speaker: James Bowen, Technical Director, Powell Ind.

Location: (watch registration page for Location)

Cost: \$75 Members, \$125 Non-Members. (Includes Lunch)

PDH Credits: 4 professional development hours will be awarded. (For USF students a certificate for course completion will be provided.) Be sure to enter your name and PE number on the signup website as it appears on your license. Florida exempt provider #00015.

RSVP: Online at:
<http://www.ewh.ieee.org/r3/floridawc/> (Select Reservations) Space limited to the first 50 registrants!!!

Make checks payable to: IEEE FWCS,
Send checks to: Ralph Painter, IEEE FWCS Treasurer
648 Timber Pond Drive
Brandon, FL 33510-2937

Questions: Tom Blair at 813-228-1111, ext 34407 or
thblair@tecoenergy.com

Your local IEEE PES/IAS Chapter is offering this seminar on Arc Flash Calculations and Solutions. We are still working on arrangements and details will be posted on the registration page.

The National Electrical Safety Code* (NEC) is the standard used by electrical utilities and OSHA when implementing utility electrical safety procedures. The 2007 edition of the code acknowledges a history of incidents that have resulted in the ignition of non-Flame Retardant clothing as a result of arc flash in the utility industry.

Effective January 1, 2009, the NEC requires electric utilities to perform an assessment of their system's arc flash potential. Depending on the results, some utilities will have to protect their employees with flame retardant clothing.

Are you prepared to meet this new requirement? This seminar will cover the procedure of performing an arc flash incident energy study based on NFPA70E and IEEE 1584 and review some potential engineering solutions to minimize the incident energy levels.

Trying To Answer The Question "Why?"

As your chairman, I'm tasked with the challenge of trying to find answers to the really difficult questions. This time around, I'm dealing with a doozy: why do we even bother going to the effort of having a Florida West Coast Section of the IEEE? I mean, the "mother ship" (the IEEE itself) sure seems to do a lot of stuff, why not just let them take care of things. Why should we go to all of the effort to hold Excom meetings, publish the Signal, design a Web site, and have all of those Chapter meetings? It sure seems like a lot of effort and for what?

Well, no matter what the answer is, I think that it's a great question to ask. In looking around at all of the activities that the section members are involved in and giving some thought to what events have been put on over the last five years that I've been a member of the FWCS, it strikes me that we sure seem to be doing a lot of things that have to do with sharing engineering knowledge. Rudy Henning continues to lead the charge to get elementary students interested in engineering. Our teacher-in-service program which targets high school science teachers, headed up by Sean Denny, is the envy of other sections. We have a strong and growing student chapter that is active at USF. Finally, the number of professional development hours (PDH) credit granting programs that the different chapters, especially PES, put on each year is staggering. Without any real centralized coordination, our section has been working to share the engineering knowledge that we know and love with as many other groups both within and outside the IEEE. Wow – how's that for a purpose?

Having given all of these activities a thought, I've come to the conclusion that the Florida West Coast Section does have a purpose for existing. Call it a mission statement, a vision, or whatever works best for you, but I believe that we can sum up our reason for being as working "To Share The Power Of Engineering Knowledge". I'm sure that the PES members will enjoy the play on words. I'm open to any feedback that you might have on this statement: do you agree or do you think that I'm missing the boat? Email me your thoughts at jim.anderson@ieee.org.

I consider this question to be answered. Now I'm working on the next question: so how can we determine if we are doing a good job of sharing our engineering knowledge? Maybe I'll have some answers by the time next month's Signal rolls around...
—Jim Anderson, Section Chair



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Seminar on IEEE 450 & 485 Standards on Sizing, Operation, Maintenance, and Replacement of Batteries for Stationary Applications

Date: October 19, 2007

Time: Registration & Breakfast: 8:00AM - 8:30AM

Seminar: 8:30AM – 3:30PM (Lunch Included)

Speaker: Marco W. Migliaro – IEEE Fellow,
President and CEO of IEEE Industry Standards &
Technology Organization, Piscataway, NJ.

Sponsor: Nolan Power Group,
<http://www.nolanpower.com/>

Location: USF, Lakeland Campus, LTB1105 in the new
Technology Building
3433 Winter Lake Road, Lakeland, FL 33803

PDH Credits: 6 professional development hours will be
awarded. Enter your name and PE number on the
signup website as it appears on your license. IEEE is
Florida exempt provider #00015.

Questions: Tom Blair at 813-228-1111, ext 34407 or
thblair@tecoenergy.com

OBJECTIVE

The objective of the Stationary Battery Seminar is to provide the participants with a basic knowledge of lead-acid and nickel-cadmium stationary batteries used in different applications. It will also provide the participants with the information necessary to select and size stationary batteries, as well as, discuss the recommendations for maintenance and testing of the batteries. In addition to terminology used, the participants will learn the basis for rating stationary batteries, the various positive plate types available, the characteristics of vented and valve regulated stationary batteries, float effect (nickel-cadmium) and charging methods. The instruction on sizing will address the development of the battery duty cycle, discrete modeling of momentary loads, factors applied for temperature correction, aging and design margin, sizing batteries using constant current or constant power and sizing a battery charger. Problem identification and the urgency of corrective actions will be discussed during the maintenance presentation. Photographs will be used throughout the seminar to enable the participant to have a more in-depth understanding of the subjects discussed. Each participant will be provided with a handout and reference materials for the seminar, Each participant will be provided with a handout and reference materials for the seminar. For those participants that are more experienced with stationary

Cost: \$100 Members, \$200 Non-Members. Includes
Breakfast, Lunch, associated training handouts, and
battery sizing calculation software. (Life members &
Students with ID, \$25)

*NOTE: DUE TO MULTIPLE REQUESTS, THE FEE FOR
THIS SEMINAR HAS BEEN REDUCED AND THE IEEE
STANDARDS ARE NO LONGER INCLUDED IN THE
SEMINAR COST.*

RSVP: <http://www.ewh.ieee.org/r3/floridawc/>

Make checks payable to: IEEE FWCS and send checks to:
FWCS, 648 Timber Pond Drive, Brandon, FL 33510-
2937

Space limited to the first 50 registrants!!!

Directions: Take I-4 to the Polk Parkway to US-98, go South
approx. 3/4 mile to USF/PCC entrance on left. Drive down
entrance road, Technology Building is first building on the right
and you can park in the parking lot on the left.

batteries, the course provides an opportunity for gaining a
greater depth of knowledge of stationary battery selection,
sizing and maintenance. It also provides the experienced user
an opportunity to learn about battery problems that he/she
may have never encountered in the field.

Marco W Migliaro has more than 38 years of experience in
the design of electrical auxiliary systems for power
generating stations and industrial facilities. Additionally, he
has been responsible for the installation, pre-operational
testing, startup and maintenance of these systems and their
components. He is an acknowledged industry expert in the
areas of emergency power systems, dc systems, batteries and
uninterruptible power supply systems.

Mr. Migliaro's credentials are too extensive to relate here.
However, throughout his career, he has conceived and
implemented new and innovative methods in the areas of
electrical design, installation, maintenance and testing. He has
been recognized for this innovation by his employers and
peers. Many of his innovations have been firsts in the
industry.

Your local IEEE FWCS Joint PES/IAS Chapter is offering
this 6 hour seminar on Battery Sizing, Maintenance, and
Replacement for Stationary Applications and references IEEE
Standards. Applications will include vented lead-acid, valve
regulated, and nickel-cadmium batteries. Many thanks to
Nolan Power for sponsoring this seminar.



IEEE Color Book Seminar Series - IEEE 141 (The Red Book) – Recommended Practice for Electric Power Distribution for Industrial Plants

Date: Friday, December 14 2007

Time: 9:00 am-3:00 pm

Speaker: Thomas Blair, P.E., Senior Consulting Engineering,
Tampa Electric Company

Location: USF Tampa Campus, College of Engineering,
Fowler Ave, Tampa, FL

Space is limited to 35 attendees. NOTE YOU WILL NEED TO PURCHASE A ONE DAY PARKING PASS from the visitor center at the main entrance off fowler.

PDH Credits: 4 professional development hours will be awarded. (For USF students a certificate for course completion will be provided.) Be sure to enter your name and PE number on the signup website as it appears on your license. Florida exempt provider #00015.

Cost: USF Students with ID FREE - \$75 Members ,
\$125 Non-Members. (Includes Lunch)

Note: This course will be available by webcast on APEX for which there will be an additional fee.

RSVP: Select Reservations online at:
<http://www.ewh.ieee.org/r3/floridawc/>

Make checks payable to: IEEE FWCS
Send checks to: Ralph Painter, IEEE FWCS
Treasurer
648 Timber Pond Drive
Brandon, FL 33510-2937

Questions: Tom Blair at 813-228-1111, ext 34407
or thblair@tecoenergy.com

Your local IEEE PES/IAS Chapter is offering this seminar on IEEE 141 IEEE Recommended Practice for Electric Power Distribution for Industrial Plants (The Red Book) as part of a series of seminars based on the IEEE Color Books. We plan to host one seminar per semester starting fall 2007 at the University of South Florida to support the Power Program at USF and provide students and local members with information on IEEE standards. This course will also be available via APEX distribution system. Please contact Dr. Ralph Fehr for more details on availability of Apex materials.

This seminar will cover the main topics from IEEE 141 of Short Circuit Calculations, Application and Coordination of Protective Devices, Grounding, Power Factor and Related Considerations, and Harmonics in Power Systems. This seminar will present guidance in design, construction, and continuity of an overall electrical distribution system to achieve safety of life and preservation of property; reliability; simplicity of operation, care and maintenance, and flexibility to permit development and expansion. Recommendations will be made regarding system planning; voltage considerations; system protective devices; fault calculations; grounding; power switching, transformation, and motor-control apparatus. Examples of fault calculations, relay coordination, and associated incident energy levels using commercially available software will be demonstrated.

Thomas Blair is a Senior Consulting Engineer with Tampa Electric and works in the Generation Engineering department. He performs electrical system analysis and uses the results to specify electrical equipment ratings, protective relay settings, and electrical system arrangement. Mr. Blair is a Senior Member of IEEE and Chair of the local PES/IAS Chapter.



November PE/IA Meeting—Lakeland Electric's Substation Electric Fire

Be sure and watch the November Signal for more details on this very informative meeting. Randy Dotson, Manager of Substation Engineering and Operations at Lakeland Electric, will share with us the details of the recent fire at Lakeland. Randy will share with us the details of the fire, including the impacts to the Florida Grid, the environmental

issues, the transformer replacement lead time, and the engineering involved in keeping this critical substation operational while waiting for the transformer replacement. Mark your calendars now for the tentative location and date of this special **lunch** meeting is: TECO Plaza – November 20th, 2007.

TISP News

Sean Denny has been very busy in August for the IEEE Teacher In Service Program (TISP). He met or spoke with a number of influential educators. Sean made presentations to the Hillsborough County School Board and to the Math and Science teachers at St. Petersburg Catholic High School. As a result, he will be presenting to students on a career day.

Many of these contacts are related to the November 14th Great American Teach In.

The *Tampa Bay Teacher Professional Days* took place in August in Hillsborough and Pinellas Counties. At Bloomingdale High School in Valrico on August 14th for the Hillsborough County In Service Day, Sean lead twelve Physics Teachers in a workshop on how to design robot arms. Following the IEEE Education Website instructions, Sean brought a collection of common materials such as cardboard, wire-clothes hangers, and fishing line, and showed how to design a robot arm to pick up a styrofoam cup. (Cont. in next column.)

* * *

Pictures below show some activities at the *Tampa Bay Teacher Professional Days*. Contact Sean and you can be in the next collection.



Sean also led a workshop for the Pinellas Professional Day at Largo High School on August 17th. Dr. Rudy Henning assisted me with the “Building A Better Candy Bag” activity. Twenty-five teachers, in groups of three, figured out how to strengthen and reinforce average paper bags. They used bottles of water and a spring scale to test the strength. Dr. Henning and Sean met the new Pinellas County Secondary Science Supervisor, Blythe Lodermeier who recently succeeded Bob Orlopp. Ms. Lodermeier was very enthusiastic about the IEEE Educational Programs and looked forward to working with us. Surveys showed that over three quarters of the teachers involved intend to use the activities in their classrooms.

Many people helped make these events successful: Sean thanks them all.

Coming up: the Hillsborough Professional Day will be October 19th and the Great American Teach In will be on November 14th. Information? Contact Sean at Venner20@aol.com.



Student News

The USF Student Branch is off to a good start. They held the first picnic of the year at Riverfront Park with a very large turnout. Dr. Chris Ferekides, the co-branch counselor, did his usual great Greek BBQ. (Picture below)

Planning for the SPAC is underway and we have started the work on the robotics competition for next March. Just as last year, EE students will be able to use the project as part of their senior project. Dr. Ralph Fehr is their advisor and is very excited about the project. Other events are being planned but one to put on your calendar is the Senior Banquet which this semester is to be on December 14, 2007.



Brain Teaser Challenge Column

—By Butch Shadwell

September BTC I hope you had no trouble with this tenth grade geometry problem last month. “Two cars are together on an east-west highway, facing opposite directions. One has a maximum speed of 60 MPH and the other 120 MPH. They both take off in their respective directions at the same time, at max speed. After 6 minutes they both make a left turn, then 8 minutes later, they both stop. How far apart are they? Assume they both made the turn instantly without slowing down.”

I know that all of you immediately realized, that I was describing a 3-4-5 right triangle. So the hypotenuse, comprising the distance between cars was obvious. Also, since the cars are always going in opposite directions, you can simply add the two car’s speeds together and calculate it as one triangle. So, two miles per minute plus one mile per minute is three miles per minute. The hypotenuse of this triangle is 10 minutes, times 3 mpm, equals 30 miles. If you got it in under 30 seconds, you deserve a gold star for that day.

October BTC Since many engineers have become stereotyped as nerds without fashion sense, I think it might be useful for me to share my extensive understanding of color and design with you that are less gifted in the area of selecting clothes and accessories. I really don’t know how I came to be so good at looking good. I suppose it is something in the genes, or is it in the jeans.

No white hose after Labor Day, and this goes for the females too. Belts should match the shoes, and never mix plaids. In fact, if you are compelled to wear plaid at all, it should never be on more than one article of clothing. Natural fibers whenever possible, and try to stay with your complexion’s seasonal colors, i.e. – winter, spring, fall, and summer. This does not mean that you get to wear a lot of wrinkled clothes if you are over 70.

Since we need to have a problem in this piece, what if you shine your shoes so the toe is really shiny and the top of the toe of your shoe is approximately a flat horizontal surface. Then with your shoe sitting on a table top, you hold a flashlight at an angle to bounce the beam off of the shiny surface toward your eye. To attenuate this reflected light most, would you place a polarizing filter with the slits in a vertical or horizontal (parallel to the table top) orientation, between your eye and the shoe? This may seem too easy again, but my main objective in this piece is fashion awareness.

In my next installment we will address acne, and ways to keep that baby face clear.

For the BTC: Reply to Butch Shadwell at b.shadwell@ieee.org (email), 904-223-4510 (fax), 904-223-4465 (v), 3308 Queen Palm Dr., Jacksonville, FL 32250-2328.



Flip-Chip for Millimeter-Wave Packaging MTT/AP/ED Chapter Meeting

**Dr. Wolfgang Heinrich
Ferdinand-Braun Institut (FBH)
Microwave Department**

DATE/TIME: Tuesday, November 13, 2007, 6:00 PM

RSVP Leave name & country of citizenship with Ken O’Connor at (813) 901 7246 by November 5th or koconnor@trak.com

LOCATION: TRAK Microwave Corporation
4726 Eisenhower Blvd., Tampa, FL
For driving directions, contact Ken O’Connor

ABSTRACT:

Emerging markets for mm-wave systems demand for cost-effective packaging solutions. Flip-chip is one of the most promising approaches in this regard. The talk presents basic features as well as design guidelines and recent results demonstrating the potential of flip-chip for mm-wave and broadband multi-chip modules and packaging.

BIOGRAPHY:

Dr. Wolfgang Heinrich received the Dipl.-Ing., Dr.-Ing. and habilitation degrees in 1982, 1987, and 1992, respectively, all from the Technical University of Darmstadt, Germany. Since 1993, he has been with the Ferdinand-Braun-Institut (FBH) at Berlin, Germany, where he is head of the microwave department and deputy director of the institute. His present research activities focus on MMIC design with emphasis on oscillators, GaAs and GaN power transistors, electromagnetic simulation and mm-wave packaging.

Dr. Heinrich has authored or coauthored more than 200 publications and conference contributions. He served as Distinguished Microwave Lecturer for the term 2003/2005. Since 2002, he has been chairman of the German IEEE MTT/AP chapter.

**Bring a guest; non-members welcome!
Refreshments will be provided.**



October 2007 Calendar of Events (For more information see P. 1 *Inside this Signal...*)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	1	2 <u>5:30 pm</u> <i>IEEE FWCS ExCom TECO Tampa</i>	3	4	5	6
7	8	9	10	11	12	13
14	15	16 <u>12:30 pm</u> <i>Life Members Clearwater p. 1</i>	17 <i>The Electric Power System— St. Louis, p. 2</i>	18	19 <u>8 am</u> <i>Battery Standards USF Lakeland p. 6</i>	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3

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