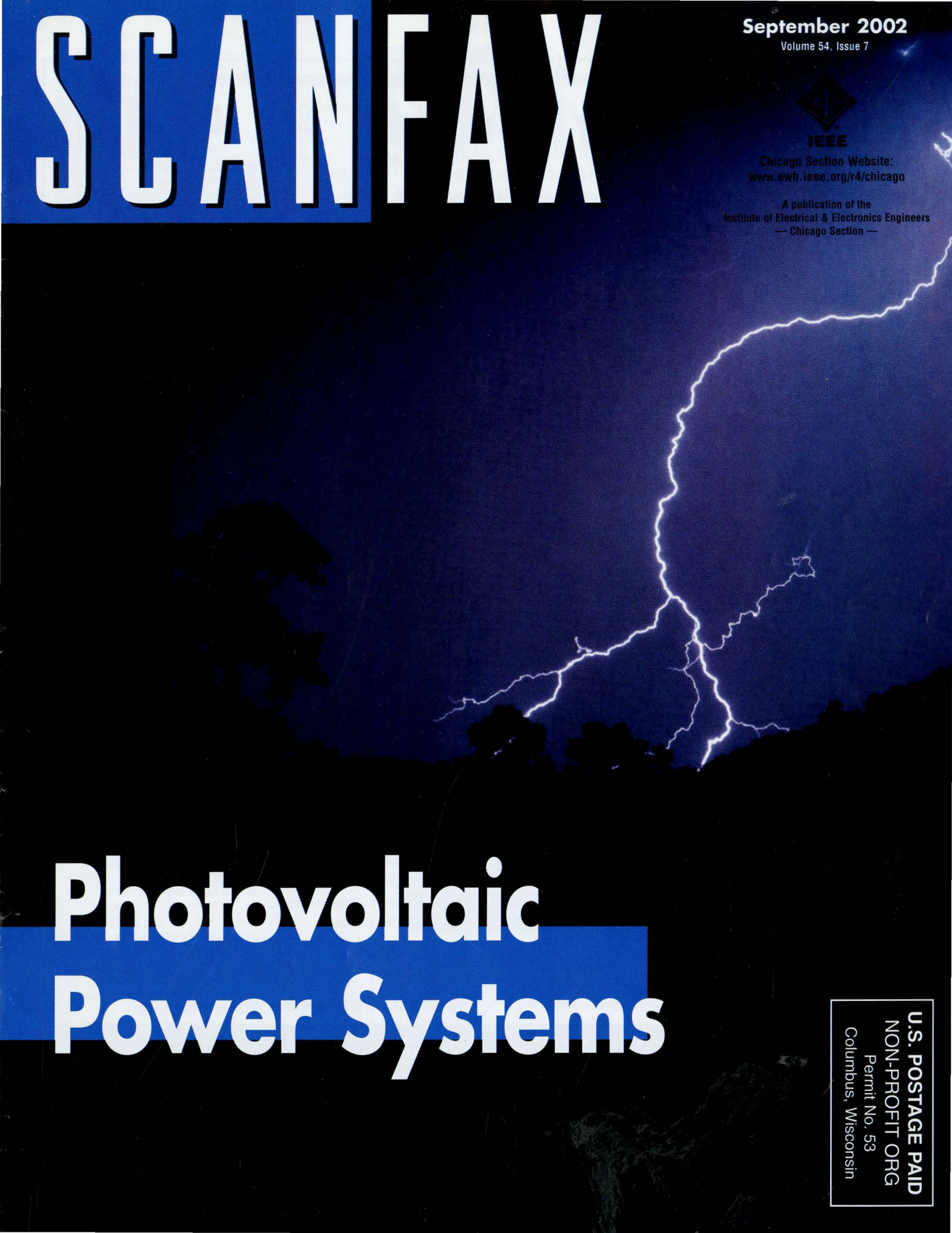


SCANFAX



September 2002

Volume 54, Issue 7



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Photovoltaic Power Systems

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A publication of the
Institute of Electrical & Electronics Engineers
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Published for IEEE by
Slack Attack Communications

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Advertising Sales

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Printed By

Town & Country Printers
Columbus, WI

SCANFAX (ISSN #0018-1297) is a monthly publication (except July and August) of the Chicago Section Institute of Electrical and Electronics Engineers, Business Office, c/o Western Society of Engineers, 28 East Jackson, Suite 1320, Chicago, IL 60604, (800) 898-4333 or (312) 253-4333. It is published by **Slack Attack Communications**, 5113 Monona Drive, Madison, WI 53716, (608) 222-7630. Printing is by **Town & Country Printers**, Columbus, WI 53925. For advertising information, contact Slack Attack Communications.

Subscriptions included in IEEE membership dues; non-member subscriptions: \$25 per year.

Address corrections should be sent to: IEEE Membership, 440 Hoes Lane, Piscataway, NJ 08854-1331 or by phone (800) 678-4333.

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SCANFAX

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CHICAGO SECTION EXECUTIVE COMMITTEE MEETING

Tuesday, Sept. 10, 6:30 p.m.
DeVry DuPage, Room TBA, 1221 N. Swift Rd., Addison, IL
No Registration Needed

ATTENTION

NEW BUSINESS OFFICE LOCATION:

The Institute of Electrical and Electronics Engineers Business Office has moved.
The new address and phone number is as follows:

Western Society of Engineers
28 East Jackson, Suite 1320
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Photovoltaic Power Systems

By Paul Zukowski

The progress that has been made in generating electricity from sunlight is evidenced by the October 10 presentation at the IEEE Power Engineering Society Chicago Chapter meeting. Kent Whitfield, senior project manager of Spire Solar Chicago, will discuss utility-active photovoltaic power systems and present information on Commonwealth Edison interconnection requirements.

In other words, solar power is ready to be incorporated in buildings and hooked up to the grid. It's not restricted to exotic uses such as powering space stations and satellites, or running equipment in desert locations far from power lines. Photovoltaic power systems are entering the main stream.

Photovoltaic cells, of course, convert sunlight into electricity. PV cells are assembled into modules and arrays to produce the desired amount of power. PV arrays can be mounted on fixed frames or on frames that follow the sun's movement. Because PV modules produce direct current, an inverter must be used in applications for which alternating current is needed.

In a recent issue of Public Management (Nov. 2001), it was pointed out that PV still plays only a cameo role in U.S. power generation. In 1999, there were about 15 to 20 megawatts (MW) of operating photovoltaic generating capacity. For reference: in 1999, about 786,000 MW of utility and non-utility electric generating capacity existed in the U.S.

Operating PV capacity is also highly concentrated in a few states, with California accounting for about 61 percent of that capacity and a total of 12 states accounting for 94 percent of operating PV capacity overall.

However, since PV modules tend to produce their highest output from mid-morning through mid- to late afternoon in the summer, which coincides with peak electrical demand at some utilities, grid-connected PV systems can reduce the need for conventional peaking power. PV facilities have the additional advantage of being modular so they can be sized to fit many situations in urban areas.

Some cities have already included the use of renewable energy from photovoltaics in their strategies. By the end of 1999, the Sacramento (Calif.) Municipal Utility District had installed more than 7,000 kW of PV systems at about 600 sites on rooftops, parking lots, and substations. In Texas, the Austin City Council resolved that 5 percent of Austin's electricity would be derived from renewable resources by 2005. The largest PV programs are located at a power plant, on parking structures, and at an airport.

Several factors are accelerating the demand for PV and other renewable sources of energy. Many states have adopted standards that require sellers of electricity to derive at least a certain percentage of their retail kWh sales from renewable energy technologies. These are called "portfolio standards." The Texas goal is 2,000 MW of new generation of renewable energy by 2009. In Arizona, the requirements for new renewable generation start at 0.2 percent of retail sales in 2001 and increase to 1.1 percent by 2007. Nevada legislation signed by the governor in June 2001 requires the Public

The cost of PV power continues to get closer to conventional sources, and when PV systems can be designed into new buildings, the cost is even more affordable.

Utilities Commission to establish a portfolio standard that starts at 5 percent of retail electricity sales by certain retailers in 2003 and rises to 15 percent by 2013. Of the total energy from renewable resources, at least 5 percent must come from solar energy systems, which include solar thermal and solar hot water systems.

Even without state requirements, the limitations on conventional power generation resources in urban areas is driving adoption of PV systems. These include siting problems, environmental considerations, and transmission capacity bottlenecks. It makes sense to put PV generation at the point of use. The cost of PV power continues to get closer to conventional sources, and when PV systems can be designed into new buildings, the cost is even more affordable. Easing permitting and allowing rooftop installations also helps make PV affordable.

In an IEEE Spectrum article (Sept., 1999) John P. Benner and Lawrence Kazmerski of

the National Renewable Energy Laboratory outlined how the technology of photovoltaic cells and materials is improving, and pointed out that support for the work of IEEE standards committees and adoption of their output as national interconnection standards will

be instrumental in lowering the cost and speeding up the deployment of PV systems. These advances must be matched by educating and training the people needed to support wide use of PV — not only system installers, but also mortgage bankers, property appraisers, and insurance professionals.

In that regard, Whitfield's October presentation will help publicize the present state of PV installation, and include information from the 2000 Chicago Electric Code. ■

CHICAGO POWER ENGINEERING SOCIETY RELOCATING ITS MEETINGS

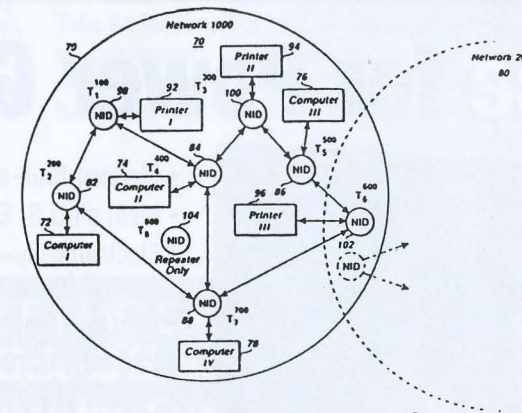
by David E. Mertz, PE

For many years, Commonwealth Edison Company, now a part of Exelon Corporation, was located at 125 S. Clark St. in the center of Chicago. The Chicago Chapter of the IEEE Power Engineering Society ably served Commonwealth Edison and its many vendors and consultants by hosting technical meeting luncheons nearby Commonwealth Edison's headquarters. Several years ago,

though, Commonwealth Edison moved out of its long-time headquarters in Chicago's Loop and relocated its technical staff to several West suburban locations. Since a large portion of Commonwealth Edison's vendor and consultant base remained in the Loop, the Chicago Chapter of the Power Engineering Society kept its meetings in the same place and the same time for several years after.

The meetings of the Chicago Chapter of the Power Engineering Society will now alternate between Chicago's Loop and the Oak Brook region. The Oak Brook area meetings will be dinner meetings, commencing between 5:30 and 6:00 p.m. Some of the Oak Brook area meetings will be held in the auditorium of Exelon's Commercial Center in Oak Brook Terrace, and some in a nearby restaurant with meeting facilities. Based on the attendance that these meetings receive, the meeting schedule for the following years will be adjusted so that the Chicago Chapter is best able to serve all of its members.

The information for each meeting, as well as contact information for the members of the executive committee, are also available at the Chapter's Web site, www.pes.chicago.org. You may also contact the chair of the Chicago Chapter, Dave Mertz, at 312.424.3637, or by e-mail at d.e.mertz@ieee.org. ■



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EVENING MEETING

IEEE — IAS/IES Dinner Presentation Overview of IEEE Bronze Book: Electrical Energy Conservation Wednesday, September 18, 2002

Dave Mertz, PE, HOH Engineers

About the Topic:

Volatile fuel costs, overloading of the electrical transmission and distribution network, and local and political forces resisting the placement of new generation and transmission facilities have again brought the topic of conservation of electrical energy to the forefront. Advancements in metering and metering networks now allow facilities to more closely monitor the control of their electrical usage. Continued technological advancement in devices that use electric power permits the same work to be done with less electrical energy. The subject presentation will review the above advancements and highlight the IEEE Bronze Book methodology for identifying, financially justifying and taking advantage of opportunities to conserve electrical energy.

About the Speaker:

Mr. Mertz is a Professional Engineer in several states and has over 15 years of experience including projects in industrial electrical distri-

bution, controls, institutional distribution, lighting, communication and transportation. Dave Chairs the Chicago Chapter of the IEEE's Industrial Applications and Power Engineering Societies. He is a director of the Consulting Electrical Engineers Division of the Chicago Electrical Association and a member of the Illumination Engineering Society and the National Fire Protection Association.

Location:

Costa's (Greektown)
340 S. Halsted St.
Chicago, Illinois

Costa's is located in Greektown on the corner of Van Buren and Halsted. See www.iaschicago.com for detailed directions and a map.

Time:

5:30 PM Social
6:00 PM Dinner
7:00 PM Presentation

Reservations:

Please call the IEEE Business Office at (800) 898-IEEE or (630) 493-4333 with your reservation. Please note any special meal requests at the time of the reservation. You can also make your reservations on line at www.iaschicago.com

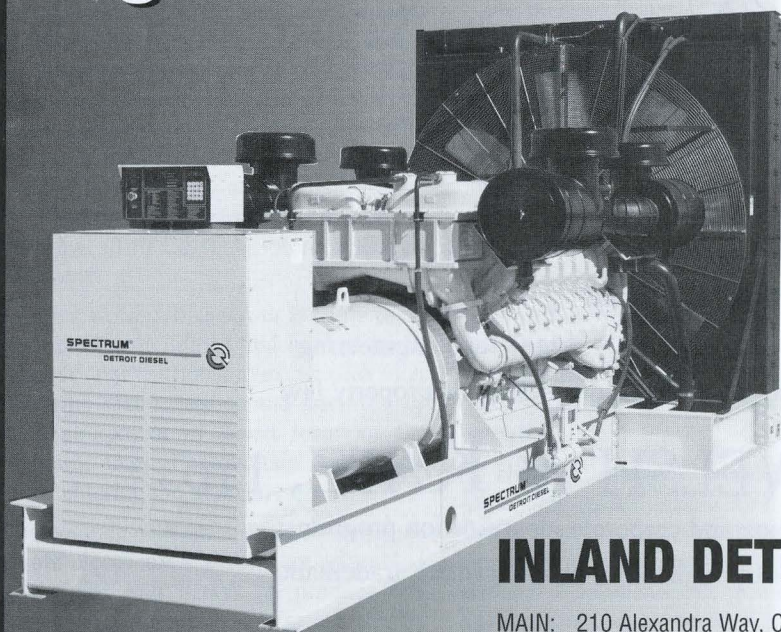
Cost:

Your cost includes the presentation and a four-course dinner with a choice of the main entry - Roast lamb, Chicken, or Fish. (Vegetarian or special dietary meals available upon request). Cost is \$25 IEEE Member and \$30 non-member. Valet parking is included with your meal.

Note:

For P.E. licenses that require continuing education for renewal, attendance at IEEE Technical Meetings is acceptable as one Professional Development Hour (PDH) per meeting.

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EVENING MEETING

IEEE Fox Valley Subsection and IIT-Rice Campus Effective, Cost Effective SOHO Computer Security Wednesday, September 18, 2002

Bill Lidinsky, IIT Rice Campus

About the Topic:

It's universally recognized that computer security has become a major problem. We hear of incidents every few days, and the cost of recovering from viruses, worms, denial of service attacks and other computer violations now ranges to tens of billions of dollars annually. While the publicized problems tend to focus on incidents involving large organizations and popular web sites, the problem also exists for small organization and the home user. Fortunately today there are ways to dramatically reduce this vulnerability for little cost and equally little effort.

This colloquium presents approaches that can be used to achieve effective security for networked computers in a small or home office environment. After describing types of attacks and vulnerabilities, some typical SOHO configurations are identified and practical schemes are discussed for achieving secure operation. Dial-up, DSL, and broadband service are considered for single and multiple LAN-based host configurations, as well as the protection that ISPs might provide. The security costs discussed include not only financial, but also both initial and maintenance effort that is needed.

About the Speaker:

Bill Lidinsky is currently a Professor of Information Technology and Assistant Director of Information Technology and Management at Illinois Institute of Technology. During the previous 20 plus years he held the positions of Adjunct Associate Professor of Electrical and Computer Engineering and Computer Science, and Senior Lecturer of Computer Science. At IIT he has been involved in computer networking, network simulation, network security, curriculum development and course design. He designed and instituted many of the graduate computer networking courses currently offered, and has taught and done research in software defined networks, network security, remote collaboration, multimedia networking, and Internet web traffic.

Location:

IIT's Rice Campus
201 East Loop Road
Wheaton, Illinois.

Take Rt.56/Butterfield Rd. to first stoplight east of intersection of Butterfield & Naperville roads. Turn north onto East Loop Road (Grady's Restaurant and Phillip's 66 Gas Station on the

corners); the campus will be on your right about a block north of Butterfield Road. More detailed directions and a map are available at <http://www.rice.iit.edu/directions.html>

Time:

6:00 PM Networking time
7:00 PM Presentation

Sponsorship:

IEEE's Fox Valley Subsection and Illinois Institute of Technology's Center for Professional Development (Rice Campus).

Information:

The Fox Valley subsection web page is at www.ieee.org/foxvalley/

Reservations:

Reservations are not required.

EVENING MEETING

IEEE EMC Society Chicago Chapter Kick-Off Social Meeting and 2002 EMC Symposium Summary & Round Table Discussion Wednesday, September 18, 2002

About the Topic:

The IEEE EMC Symposium is the Society's annual showcase event. It is typically held during the month of August and includes over 200 technical presentations, dozens of workshops and committee meetings, and an exhibition with over 275 vendors.

Objectives:

This chapter event will feature informal discussion amongst meeting attendees on the various technical papers presented at the 2002 EMC Symposium. In addition, attendees will discuss

the outcome of the numerous technical committee meetings held during the Symposium. This chapter meeting provides an excellent opportunity for those unable to attend the Symposium to stay current with all the latest industry news and innovation as well as with newly offered products and services.

About the Speaker:

Chapter members and guests who attended the Symposium are encouraged to share with the audience their notes, comments, findings, and experiences from the Symposium.

Location:

Elite Electronic Engineering
1516 Centre Circle
Downers Grove, IL 60515

Directions:

<http://www.elitetest.com/Illinois.htm>

Time:

6:30 PM Social Hour
7:00 PM Meeting Start

Reservations:

Steve Laya (Elite)
Phone: 630-495-9770

IEEE Chicago Section/AEE Chicago Chapter ANL Advanced Photon Source Tour Thursday, September 26 2002

About the Topic:

The IEEE Chicago Section, our Fox Valley Sub-Section, and our Joint Chapter on Engineering Management and Professional Communication, in conjunction with the Association of Energy Engineers (AEE) invite you to a guided tour to show you some of the world-class research being done at Argonne.

Information:

Please note the following restrictions based on Argonne's current security rules:

- Send e-mail to AEE's Steve Krstulovich at "stevek@fnal.gov" with the name(s) of each prospective visitor, his/her citizenship (and citing your IEEE affiliation), no later than September 24th, 2002 so we can be cleared

ahead of time. Be sure to notify Steve ASAP so Argonne can arrange for a sufficient number of guides.

Note: Since the dinner (at a cost of \$ 26 per person payable at the dinner) will be optional, also advise Steve by September 24th how many of you plan to come to this dinner.

- Visitors can enter (and leave) only via Argonne's eastern gate on Cass Avenue just south (and west) of its intersection with I-55 (the Stevenson Expressway)

Location:

Argonne National Laboratory

Time:

5:30 - 6:00 PM Networking and Social Hour
Welcome to Argonne Dr. Robert Wunderlick,

Argonne Area Manager, DOE (formerly DOE's Project Manager for constructing APS; now serving as the Administrator of DOE's APS contract with Argonne Labs)

6:00 - 7:00 PM Dinner

7:00 - 8:00 PM Guided Tour of APS led by Dr. Wunderlick

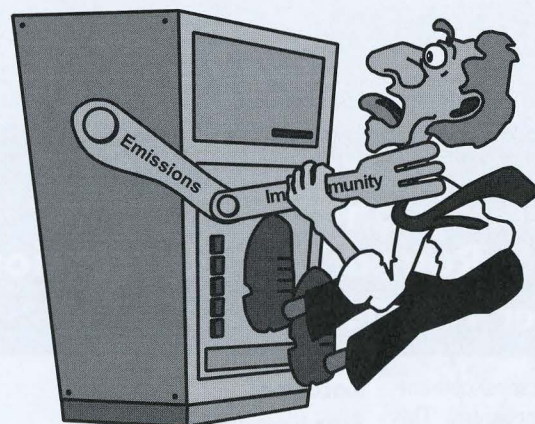
Note:

For additional information, directions, and the dinner menu choices please refer to AEE's web page: http://energyengineers.org/advanced_photon_source.htm

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IEEE headquarters provides the following web page to let you change your IEEE mailing address and/or IEEE e-mail address directly: <http://www.ieee.org/membership/coa.html>. You will need your IEEE Account Number, Password, and Membership Number for initiating such a change securely. The instructions for changing your IEEE mailing address include the methods for using the mail, e-mail, or the telephone. Note: Please modify your IEEE mailing address only for a permanent address change. Otherwise, the "normal lead time" for preparing a correct address label for your IEEE publications may cause you to lose this valuable information.

Introduction to Electromagnetic Compatibility Design Practices* - October 3-4 Design Techniques for Controlling Radiated Emissions* - October 7-8



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Donald L. Sweeney, with 15 years experience teaching EMC design classes and 30 years experience in the EMC & Electrical Engineering fields, will be offering two courses at the Hilton in Northbrook, IL on October 3-4 & 7-8, 2002.

For students to apply what they have learned from the classes to their specific products, they are encouraged to bring a product, or a schematic of it, to a free personal consultation offered by the instructor or his associate on October 5 or 9.

For more information or to receive a brochure,
call D.L.S. at 847-537-6400 or find us on-line at www.dlsemc.com.

*These are the same classes formerly offered by Don Sweeney through the University of Wisconsin.



IEEE Fox Valley Subsection/IIT-Rice Campus and the FBI Computer and Network Security Workshop Tuesday & Wednesday, October 29-30, 2002

About the Topic:

This workshop will bring together knowledgeable security practitioners and responsible executives from organizations such as computer and network technology providers and manufacturers, scientific laboratories, law enforcement, medicine, and legal organizations to discuss and share their security needs, problems, technologies, security systems, plans, etc. The workshop will be organized into sessions based upon factors such as economic sector, organization interest, and technology. Sessions will consist of a moderator and a panel of participants each making short informal presentations after which there will be extensive opportunity for discussion and additional contributions from the audience. Additional sessions will focus on specific security technologies.

Topic Areas:

1. Computer and Network Crime
2. Computer and Network Law
3. Enterprise Security Risks, Needs and Implementations
4. Technology and Risk Assessment

Sponsoring Organizations:

Institute of Electrical and Electronic Engineers, Fox Valley Subsection, Illinois Institute of Technology Center for Professional Development, and Federal Bureau of Investigation

Some Participating Organizations:

Argonne and Fermi National Laboratories, FBI, IIT, Kent Law School, State of Illinois, County of Cook, IBM, Eltek Mfg., Molex Mfg., Tellabs, Lucent Technologies, IETF, ABN-AMRO, Citibank, and Corporate Computer Services.

Location:

Illinois Institute of Technology's Rice Campus
201 East Loop Road
Wheaton, Illinois.

For directions, please visit
<http://www.rice.iit.edu/directions.html>.

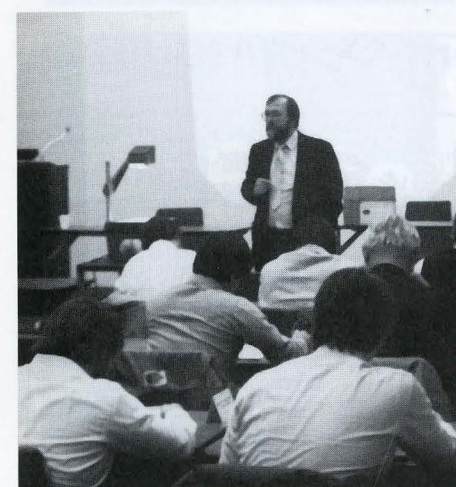
Reservations/Information:

Space is limited, so reserve your space by contacting Barbara Kozi at (630) 682-6040 or kozi@iit.edu. There will be a \$50 fee, payable in advance, that covers attendance, light breakfasts, and lunches.

Reservations and checks are due by Monday, September 30, 2002.

For additional details, please visit
www.cpd.iit.edu/securityworkshop.

PRESS RELEASE: D.L.S. Offers Two Classes in October



the beginning stages of design through final testing. The courses are based on two textbooks and are supplemented with practical information. Don originally offered these classes through the University of Wisconsin; however, today they are being offered directly through D.L.S.

To receive more information or a brochure with a detailed description of the classes, phone 847-537-6400 or go online at www.dlsemc.com.

About the Instructors:

Donald Sweeney, Senior EMC Engineer is president of D.L.S. Electronic Systems, Inc. He is a graduate of the Department of Electrical Engineering, University of Illinois at Urbana and has 30 years experience in the electrical engineering field. Most of his time had been devoted to solving problems in electromagnetic engineering and closely related disciplines. He specializes in EMC, RFI & EMI consulting and testing. Don has taught at the University of Wisconsin (both Madison and Milwaukee Campuses) and at Oakton College and consults for companies worldwide. He has served as a special consultant to Lawrence Livermore National Laboratory and the Nuclear Regulatory Commission. He is past Chairman or the Chicago area IEEE EMC Society, founding chairman of U.S. Council of EMC Laboratories (USCEL), a NARTE certified EMC Engineer and has served on the board of directors IEEE EMC Society.

Roger Swanberg, Senior EMC Engineer at D.L.S., teaches circuit board design. He is a graduate of IIT in Chicago and has over 35 years experience in EMC and electronics design, as well as regulatory compliance. Roger is Vice-Chairman for the Chicago Section of the IEEE EMC Society.

Corey Sweeney has been involved with D.L.S. since its beginning in 1983. He has worked on various computer projects and has participated in the IEEE EMC Computer Modeling, Technical Activities Committee, TC-9. He has been teaching the practical applications mathematical section of this class since 1998.

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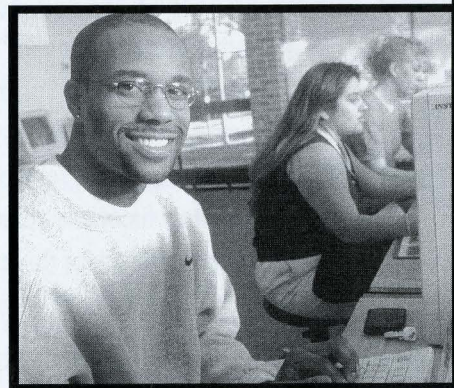
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