# SCANFAX

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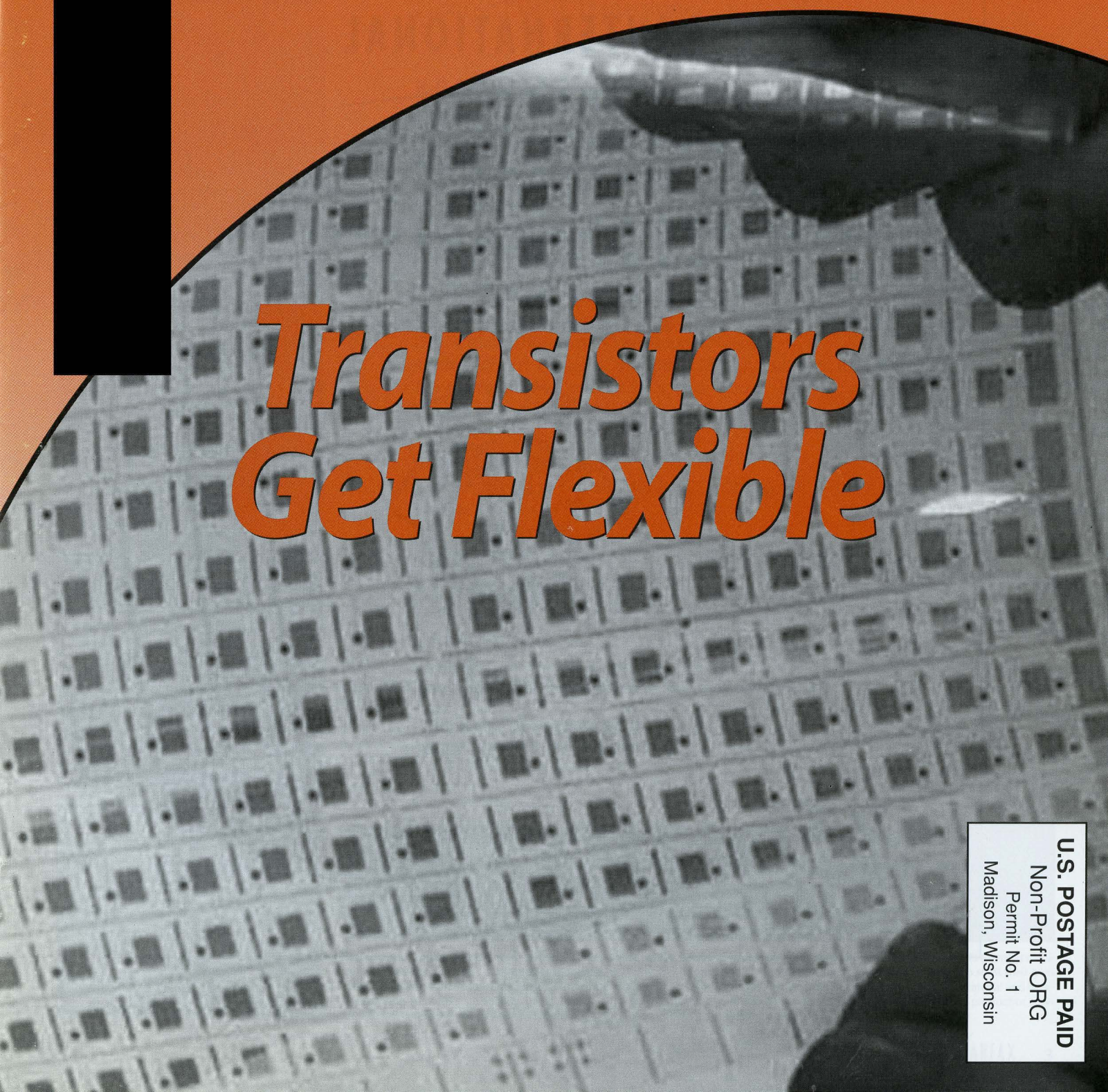
— Chicago Section —



# Transistors Get Flexible

IEEE

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Meeting notices should be sent to graphics@slackattack.com.



# SCANFAX

**January 2005**
**Volume 57, Issue 1**

## FEATURES



## UPCOMING EVENTS



## DEPARTMENTS



**Chicago Section Executive Committee Meeting**
**Tuesday, January 13, 2005, 7:00 p.m.**
**DeVry DuPage, Room TBA, 1221 N. Swift Rd., Addison, IL**
**No Registration Needed**

# New Materials Could Lead to Printed, Flexible Plastic Transistors

By Paul Zukowski

Among the ingenious technological discoveries and products recognized in the third annual Scientific American 50 Awards in November was a new material that may allow electronics to be printed like a newspaper.

The magazine's Board of Editors said that the quest for super-inexpensive plastic electronics that would be far more flexible than silicon versions and work for applications like roll-up computer displays had been stymied of years because most ingredients for such devices that are printable as inks degrade rapidly in the presence of oxygen. However, at an April 2004 Conference, researchers unveiled air-stable, printable substances that can be semiconductors, conductors and insulators, the three elements needed to print transistors. The semiconductor and insulator are organic polymers, whereas the conductor is an organic-inorganic hybrid.

The breakthrough was announced by Beng Ong, a research fellow at the Xerox Research Center of Canada, Mississauga, Ontario. Ong has been active in this area for years. A December 2002 article in the New York Times reported that Ong had described polythiophene, an experimental polymer that could be used to make organic transistors on a plastic substrate, at the Materials Research Conference in Boston.

While earlier organic semiconductors decayed when exposed to air, Xerox researchers said the new material promises to have the electronic properties of silicon yet be slow to degrade in the presence of oxygen. Polythiophene even then had achieved performance benchmarks, an order of magnitude greater than any other polymer materials.

An executive from Xerox's innovation group in Toronto was quoted as saying that a near-term commercial application for the new material could be in the manufacture of transistors that drive liquid crystal displays in phones and personal digital assistants. These printed plastic transistors would survive being dropped, or even being sat on. In contrast, silicon-based microelectronic devices are chemically etched and deposited on a rigid silicon substrate using a photolithographic process.

Plastic semiconductors that could be printed in high volume and low cost have been a hot area for research and commercial activity. Visions of portable, poster-like television screens and monitors made of a single sheet of flexible plastic drive the work. Other projected applications range from identification tags on merchandise to electric paper displays.

Ong, an inventor who holds more than 110 U.S. patents and manages the printed organic electronics group at XRCC in Ontario was quoted as saying. "One of the main cost advantages of printed plastic transistors is that they will not need specialized, costly fabrication facilities and procedures, while silicon transistors require ultra-clean room environments, high-temperature vacuum systems, and complex, photolithographic processes."

Xerox is at the forefront of the printed plastic circuit work because its scientists have a long history of expertise and research success in the technologies that are key to its printing and copying products, such as conductive organic materials, printing technologies, and device and systems technology. Xerox is thus in a good position to design performance-specific materials and printing processes for device manufacturing.

Xerox has been working with both Motorola and Dow Chemical to demonstrate circuit printing. Xerox researchers envision a new electronics manufacturing process on roll-to-roll machinery, which is now used in publishing and in the manufacturing of solar cells.

Under a grant from the National Institute for Standards and Technology, the Xerox Palo Alto Research Center has been experimenting with a manufacturing process based on roll-to-roll material handling and depositing that would form the polymer material into circuit patterns using ink jets. Working with Motorola and Dow, they hope to develop novel organic electronic materials and processing technologies to enable the fabrication of large-area electronic devices, such as displays, using relatively inexpensive printing technologies in lieu of semiconductor lithography.

Ong and his group developed the breakthrough polythiophene material by working to understand which polymer structural features in existing materials were responsible for electronic limitations. They then came up with design rules to get around those limitations. The materials were evaluated in simple devices at XRCC, with further testing and experimental printing at PARC and select electronics firms around the world.

The experimental organic semiconductor material developed by his group is second-generation smectic liquid crystal with field effect transistor mobility of up to 0.12 square centimeters per Volt second, a measure of the speed of electron movement per unit of electric field. In addition, current on-off ratios are in an excellent range of 106 to 107, and devices containing the experimental Xerox material exhibit little bias stress, hysteresis or instability in air.

PARC has had extensive experience in large area electronics based on amorphous and polycrystalline silicon. It has demonstrated jet-printed polymer field effect transistors and is developing processes to print complete active matrix arrays.

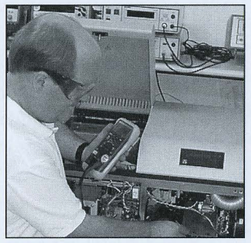
Xerox is also reported to be looking at Ong's new materials for printed organic electronics and a variety of other technologies, including electrical switch components, organic light-emitting diodes, and emulsion aggregation microspheres.

Plastic transistors were also among 20 future hot technologies to watch according to PC Magazine in a 2003 article. The magazine said that plastics are the future of the $30 billion computer display market, and may also lead to new breeds of computer memory and microprocessors. The editors expected that within five years, companies like DuPont and Xerox will begin using plastics in conjunction with organic light-emitting diode technology and organic transistors to build flexible displays. The article quoted Ong as saying that eventually, plastic transistors could be used to build entire devices so flexible and light that they could be integrated directly onto almost any type of matter, including a piece of clothing. Low-cost transistor-impregnated attire could be used for everything from ticket-less check-outs at retail stores to monitoring personnel at high-security installations.

Research into organic transistors may lead to new generations of smart cards, toys, appliances, and many other things that might not be physically or commercially viable using today's silicon-based technology. They won't supplant silicon devices, but they could offer some interesting new options. ■

# D.L.S. Attains Status of Fully Qualified CSA Agent

D.L.S. Conformity Assessment, Inc., of Wheeling, Illinois, has attained the status of a fully qualified Agent of CSA International. This means D.L.S. now provides product safety testing at their Wheeling, IL facilities for both US and Canadian requirements to CSA, UL, ANSI, FM and other North American standards. D.L.S. is the first lab to achieve this status.



This new relationship provides an additional fast option for manufacturers of Medical and Laboratory equipment. It provides prompt localized testing by D.L.S. with the product certification of CSA International. D.L.S. is also able to help manufactureres of ITE, Industrial, Household, Audio-Visual and other electric and electronic equipment reach their market quickly.

For 84 years, the CSA safety mark has been proudly displayed on electrical and electronic equipment of all types, items you see and use every day. CSA, a global leader in product safety compliance programs, has been designated as an NRTL (Nationally Recognized Testing Laboratory) by OSHA, a status identical to other safety agencies in the United States.

D.L.S. now provides testing and certification for the well-known CSA Mark, CSA US, CSA Canada, CSA Canada and US, as are depicted in the marks below. This is all in addition to the large variety of EMC testing D.L.S. offers. Manufacturers can now meet their goal of getting high quality Safety and EMC compliance testing all in one place, all at one time.

For more information: www.dlsemc.com
Jack Black at 847-537-6400 or at
jblack@dlsemc.com
Tom Brenner at 847-537-6400 or at
tbrenner@dlsemc.com

# Call for Participation

## 3rd Annual IIT Security Workshop

IIT's Center for Professional Development, the IEEE Communications Society, IEEE Fox Valley and UniForum Chicago will sponsor the 3rd Annual Security Workshop on Thursday 7 April 2005 at Illinois Institute of Technology's Rice Campus in Wheaton Illinois. The last workshop, held on 26 February 2004 was attended by over 200. The workshop consisted of technical sessions, vendor presentations, and a product show.

**The 2005 workshop will have a format similar to that of the last workshop, consisting of:**

- Technical sessions
- Vendor sessions
- Exhibitor
- Tutorials

There are several ways you and/or your organization can participate in this event:

- **Sponsor** – become an event sponsor
- **Session Organizer** - Identify/invite the speakers and pull together the session and moderate it
- **Tutorial Presenter** – present a tutorial on a security topic
- **Presenter** – make a presentation on a topic of interest to computer and network security (topic recommendations are being accepted)
- **Exhibitor** – promote your business with a table-top display – $100 for an entire day
- **Attendee** – $45 per person – includes materials, Continental breakfast and lunch.

Security areas of interest include but are not limited to:

- **Sectors** *(problems and solutions specific to these economic sectors)*
- Healthcare & medicine
- Banking and financial
- Education
- Legal & law enforcement
- Local government
- Energy
- Communications
- Transportation
- Manufacturing
- **Technology** *(problems and solutions related to these specific technology areas)*
- Wireless network security (LAN & WAN)
- Security at universities & other "open" organizations
- Small business & home office security
- Security at universities & other "open" organizations
- Security Capability Maturity Models
- Open source security products & systems
- Organizational security policy
- Security vulnerability auditing
- SPAM, phishing & what to do about them
- VoIP security and privacy
- Operating system security
- Wired network security
- Embedded systems
- Security and authentication devices

We welcome your suggestions for additional topics. Student projects are also invited.
**We are also considering a series of tutorials.**

**Indications of Interest**
We invite those interested in organizing sessions, making presentations or participating in the vendor exhibits to indicate their interest by 15 January 2005. Let us know how you want to be involved.

**Session Proposals**
**Proposals for organizing sessions with a specific sector or technology focus (technical or product-related) should be submitted by Friday 28 January 2005 to http://www.cpd.iit.edu/netsecure05/sessions.php**

**Presentations**
**Those interested in making presentations to be included in a session should submit an abstract by Friday 28 January 2005 to**
http://www.cpd.iit.edu/netsecure05/presentations.php

**Vendor Exhibits**
**Parties interested in having a booth at the exhibits should submit their request by Friday 28 January 2005 to** http://www.cpd.iit.edu/netsecure05/vendors.php

**Tutorial Proposals**
**Parties interested in presenting a tutorial should submit an abstract by Friday 28 January 2005 to** http://www.cpd.iit.edu/netsecure05/tutorials.php

**Organization Meeting**
**An organization meeting is being planned for very early February 2005. We will announce the date in late December to those indicating interest. All are welcome.**
Please pass this information along to others that you feel may be interested.
For additional information, please contact Professor Bill Lidinsky at lidinsky@iit.edu or 630.682.6028.



# Evening Meeting

Chicago Chapter of the IEEE Power Engineering Society

## Impact of Electricity Markets on Electric Power Systems

### Wednesday, January 12, 2005

**Mohammad Shahidehpour**
**Illinois Institute of Technology**

***About the Topic:***
While the objectives of a restructured power company for delivering electricity to end-customers are perceived to remain the same in electricity markets, new types of unbundling, coordination, and rules are required to guarantee a sound competition among market participants and non-discriminatory open access to transmission users. This presentation will discuss electricity restructuring issues such as Why is the restructuring necessary? How is the restructuring being implemented? Who will maintain the control of transmission grid? What type of competition is necessary for a reasonable operation of electricity markets?

***About the Speaker:***
Mohammad Shahidehpour is a full professor in the Electrical and Computer Engineering Department and Director of the Electric Power and Power Electronics Center at Illinois Institute of Technology (IIT). He is the author of 300 technical papers and four books on electric power systems planning, operation, and control. He is the recipient of the Edison Electric Institute's Outstanding Faculty Award, HKN's Outstanding Young Electrical Engineering Award, Sigma Xi's Outstanding Researcher Award, IIT's Outstanding Faculty Award, and University of Michigan's Outstanding Teaching Award. He is the past president of National Electrical Engineering Honor Society, and serves as the Editor of the IEEE Transactions on Power Systems. Dr. Shahidehpour has lectured across the globe on electricity restructuring issues and has been a visiting professor at several universities. He is a Fellow of IEEE.

***Location:***
ComEd Commercial Center, 1919 Swift Drive, Oak Brook, IL
(near the I-290 and I-294 interchange)

***Time:***
5:30 Social
6:00 Dinner
6:45 Presentation
8:30 Adjourn

***Reservations:***
Please call the IEEE Business Office by noon on Monday 10 January 2005 at (312) 253-4333 or (800) 898-IEEE to make your reservation. The cost of the optional box-lunch style dinner is $15.00 for IEEE members, $20.00 for non-members, payable at the event. Sorry, we are unable to process credit cards. Checks payable to "IEEE-PES Chicago Chapter" and cash are accepted, and receipts will be provided.

***Continuing Education:***
IEEE technical meetings may be acceptable as continuing education where required for maintenance of professional engineering licensure. Refer to the individual state's requirements for details.

***For More Information:***
Please visit the Chicago Chapter IEEE PES web site: http://peschicago.org

# Evening Meeting

IEEE – IAS/IES Dinner Presentation

## City of Chicago Fire Alarm Systems

### Wednesday, January 19, 2005

**David Schoonover**
**SimplexGrinnell**

***About the Topic:***
Mr. Schoonover will give a presentation pertaining to one of the more unique fire alarm applications – the City of Chicago. The presentation will cover the proper specification and application of detection and alarm devices in both normal and high rise applications.

***About the Speaker:***
Mr. Schoonover is the A/E Business Manager for SimplexGrinnell North Central Operations in the Chicago land area. He has over 15 years of fire alarm industry experience, during which time he specialized in high-technology sales and system design. David specializes in high-rise and networked fire alarm systems. David is currently working closely with the architect and engineering community to enhance the support structure for fire alarm system designers. David is NICET III certified in fire alarm systems and has a bachelor's degree in electronic engineering.

***Location:***
COSTA'S (GREEKTOWN) 340 Halsted St.
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 Social
6:00 Dinner
7:00 Presentation

***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.

***Reservations:***
Please call the IEEE Business Office by noon on Monday 10 January 2005 at (312) 253-4333 or (800) 898-IEEE to make your reservation. You can also make your reservations on line at www.iaschicago.com

***Continuing Education:***
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.

***For More Information:***
Visit IEEE Chicago Section IAS/IES website at www.iaschicago.com.

# Evening Meeting

IEEE Chicago/Rockford Consultants' Network A joint Affinity Group of the IEEE Chicago and Rock River Sections

## The Maximum Performance Difference • Monday, January 31, 2005

**Jeff Gardner**
**President, Maximum Performance Group**

***About the Topic:***
As engineers we are trained in technology, but often are not well prepared for marketing and selling our services. This is an important aspect in the current economy and especially valuable for independent consultants. The Maximum Performance Difference will present eight critical success factors that top salespeople utilize. Join us for this presentation and improve your effectiveness in finding a job or getting more clients.

***About the Speaker:***
Maximum Performance Group LLC is a Chicago-based training and consulting firm specializing in Sales and Sales Management Strategies. Established in 1990, MPG has helped hundred's of companies to meet the challenges of today's complex and competitive market. Jeff Gardner has more than 20 years of real-life sales and management experience. Jeff has worked with and trained over 10,000 salespeople and sales managers.

Jeff Gardner is a regular contributor to OPI magazine and co-author of the book "Maximum Selling."

Jeff is personally committed to increasing expertise in professional selling and sales management through research and study. By using both "street smarts" and "book smarts" he is able to develop and motivate sales professionals to higher levels of sales success.

***Meeting Location:***
Palatine Public Library, 700 North Court St., Palatine IL • 847-358-1216

***Dinner Location:***
Bakers Square, 270 E. Northwest Highway, Palatine (at the corner of North Court St. just south of the library)

***Time:***
6:15 p.m. Optional group dinner at Bakers Square (order from the menu).

7:30 to 9:15 p.m. Meeting - Networking session, presentation, and discussion.

***Reservations:***
Reservations are not required, but please indicate your intention to attend the dinner/meeting by email to Bob.Abrant@IEEE.org.

***Information:***
Meetings are usually held on the last Monday of odd-numbered months. For consulting network information please contact Ben Miller at consultnet@BMillerEngineering.com. For information about programs contact Bob Abrant at Info@AcumenDesignInc.com or visit the web sites at www.ewh.ieee.org/r4/chicago/calendar.html or www.drblank.com/coaction.htm

***Continuing Education:***
Attendance at this meeting will earn 1.0 PDH. See you on January 31st and bring consultants and those aspiring to be consultants for a pleasant and informative evening of networking. Don't forget to bring business cards.





# Technical Seminar

IEEE-IAS Chicago Chapter

## February Technical Seminar 2005
## 2005 NEC® Changes

**February 19, 2005 • 7:30 a.m. to 4:00 p.m.**

Midwest Conference Center • 401 West Lake Street, Northlake, Illinois 60164
Presenter: NFPA recognized National Electrical Code expert

This one day seminar covers the most significant 2005 NEC® code changes, including their relationship to the design, installation, and maintenance in residential, commercial, and industrial locations.

***Agenda:***

| | |
|---|---|
| 7:30 am | Registration and Continental Breakfast |
| 8:00 am | Analysis of Definitions; Branch-Circuit Analysis; Service and Feeder Applications; Feeder or Service Neutral Load |
| 9:45 am | Break |
| 10:00 am | Grounding and Bonding; Wiring Methods; Conductors for General Wiring; Boxes and Fittings |
| 12:00 pm | Lunch |
| 12:30 pm | Motors, Motor Circuits and Controllers; Hazardous (Classified) Locations; Health Care Facilities; Emergency and Standby Systems |
| 2:00 pm | Break |
| 2:15 pm | Signaling Circuits; Communications Circuits; CATV Circuits; NFPA 70E - Electrical Safety in the Workplace |

**Each On-Site Seminar participant receives:**
- A student manual filled with exercises and activities
- 2005 NEC®
- A Certificate of Attendance
- A handsome canvas briefcase and calculator
- Accredited (IACET) Continuing Education Units (0.7)

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NO RESERVATIONS WILL BE ACCEPTED AFTER FEBRUARY 11, 2005

NAME:

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ADDRESS:

CITY, STATE, ZIP:

*Bus. Phone: ( )

*Home Phone: ( )

*e-mail

*Please provide these so we may contact you if there is a cancellation.

### FEES:

IEEE Member Registration ..... $175.00
(To receive the member rate, provide your IEEE member No. _____)

IEEE Non-Member Registration ..... $225.00

TOTAL ..... $_____.00

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**MAIL WITH THIS COMPLETED REGISTRATION FORM TO:**
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Greeley and Hansen
100 S. Wacker Drive, Suite 1400
Chicago, IL 60606.

Registrations will not be accepted without payment.

Attendance limited to the first 100 registrants.

# Professional AND Business Directory



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