



# Madison Section NEWSLETTER

Volume 4, Number 1

Serving IEEE Members of South Central Wisconsin

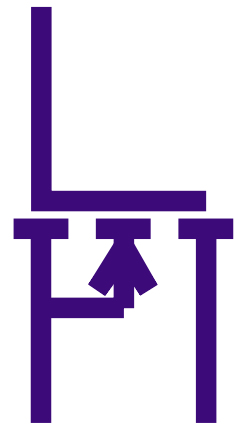
January 2001

## Challenges Facing the Semiconductor Industry

- Date/Time:** Thursday, January 11, 2001, 11:45 AM - 1:00 PM  
**Speaker:** Dean Paul S. Peercy, College of Engineering, UW-Madison  
**Location:** Rocky Rococo's Pizza, 7952 Tree Lane (Madison Beltline Hwy. at Mineral Pt. Rd.), Ph 829-1444  
**Menu:** Pizza buffet, salad and soft drinks (cost \$8.00)  
**RSVP:** by Jan. 8th to Roy Thompson via email (roy.thompson@tdstelecom.com) or call 608/664-4415

*Non-member guests are always welcome!*

The most recent update of the Semiconductor Industry Association International Technology Roadmap for Semiconductors outlines the technology advances needed for the semiconductor industry to continue its historical rate of productivity improvement of 25-30% per year. Leading-edge companies now manufacture devices with feature sizes smaller than 150nm. Major technical challenges were encountered in achieving the current feature sizes, and the number and difficulty of technical challenges will increase with decreasing feature size. By the end of the 15-year period addressed in the Roadmap, CMOS (Complementary Metal-Oxide-Semiconductor) field effect transistors with 20nm gate length and integrated circuit interconnects with ~35nm width are projected. This talk will present some of the major technical challenges that will be encountered as the industry attempts to continue the scaling required to follow Moore's Law. Technology breakthroughs, in terms of materials and processes, will be required as device sizes decrease below 100nm because existing materials and technologies are approaching their physical limits. New materials will be required for the gate stack since continued scaling with silicon dioxide would require oxide thickness of 0.5-0.6nm, equivalent to ~2 monolayers of oxide. Circuit speed will increasingly be limited by interconnect delays, requiring new materials for the inter-level dielectrics and new approaches to circuit design and layout. New patterning approaches will be required to obtain the feature sizes for 50nm and below. In addition, major advances in metrology will be required not only to develop these new materials and processes but also for low-cost, high volume, manufacturing.



Paul Peercy began his leadership of the College of Engineering Sept. 1. He succeeded John G. Bollinger, who stepped down this year after serving as dean for 18 years. Peercy had been president of SEMI/SEMATECH since 1995. SEMI-SEMATECH is a non-profit consortium that steers technical issues for more than 130 of the nation's top suppliers to the semiconductor industry. Prior to that position, he was director of microelectronics and photonics at Sandia National Laboratories in Albuquerque, New Mexico. He received his masters in 1963 and PhD in 1966 from the UW-Madison Department of Physics. He is a fellow of the Institute for Electrical and Electronics Engineers,

the American Association for the Advancement of Science and the American Physical Society. His research spans several areas of solid state and materials physics and engineering. In his new position, he guides a college with more than 3,000 undergraduates, 1,000 graduate students and an annual operating budget of approximately \$100 million.

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## Coming in February... MGE Wind Farm Construction and Operation

**Date/Time:** Thursday, February 15, 2001, 11:45 AM - 1:00 PM

**Speaker:** Donald D. Peterson, Exec. Director Energy Products and Services, Madison Gas and Electric Company

**Location:** Rocky Rococo's Pizza, 7952 Tree Lane (Madison Beltline Hwy. at Mineral Pt. Rd.), Ph 829-1444

**Menu:** Pizza buffet, salad and soft drinks (cost \$8.00)

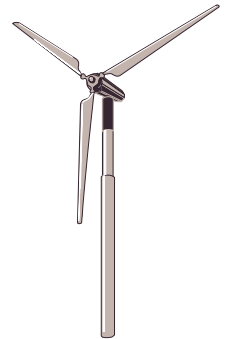
**RSVP:** by Feb. 12th to Roy Thompson via email ([roy.thompson@tdstelecom.com](mailto:roy.thompson@tdstelecom.com)) or call 608/664-4415

*Non-member guests are always welcome!*

The presentation will focus on the following topics:

- Wind Turbine Specifications
- Siting and Approvals
- Construction Challenges
- Project Performance
- Green-Priced Energy

Don has held various management positions at MGE including Supervisor - Generation and Transmission Planning, Manager - Residential Marketing Services, and Executive Director - Energy Products and Services. His duties have included power plant and transmission line planning and design and working with utility customers regarding their use of electricity and natural gas. He received a Bachelor of Science degree in Electrical Engineering from the University of Iowa in Iowa City and is a registered Professional Engineer in the State of Wisconsin. Don also was a past Chairman of the IEEE Power Engineering Society, Wisconsin Chapter.



## IEEE-USA Webzines to Focus on Careers and Public Policy

IEEE-USA will offer two insightful monthly webzines, TODAY'S ENGINEER and POLICY PERSPECTIVES, free to all IEEE members in mid-January 2001. Previously available only through subscription, the award-winning TODAY'S ENGINEER features articles on career guidance, tips, strategies and solutions for all segments of the profession. POLICY PERSPECTIVES offers an in-depth look at policy issues important to practicing engineers - both young professionals and experienced engineers. Penned by experts from industry, government and academia, IEEE-USA's webzines are your guides to thinking outside the cubicle!

## Officer Election Results

At the December 21, 2000 monthly meeting, the IEEE Madison Section conducted its annual officer nominations and elections prior to the technical presentation. The entire slate of nominees was unanimously elected. Congratulations to the following officers.

Chair:	Craig Heilman
Vice-Chair:	Tom Yager
Secretary:	Roy Thompson
Treasurer:	John Hicks
Mem. at Large:	John Cortsvet
Mem. at Large:	Les Schroeder
Mem. at Large:	Sandy Rotter
Mem. at Large:	Dan Danbeck

## National Engineers Week

National Engineers Week 2001 is less than 3 months away! For the past 50 years, National Engineers Week (E-Week, <http://www.eweek.org>) has united engineering professionals across the nation in celebrating the profession and its innumerable accomplishments. Once again, IEEE-USA is participating in E-Week as a member of the National Engineers Week Committee.

An array of activities and events will highlight the 50th Anniversary of E-Week. Over the coming months, we will keep this page (<http://www.ieeeusa.org/EWeek/index.html>) updated with links and news on E-Week activities. Here are a few of the major activities planned for 2001:

*Future City Competition* challenges seventh- and eighth-graders from across the United States to create their own visions of cities of tomorrow. The Competition is now bigger than ever - with almost 30 cities participating! Would you like to get involved? Visit the Future City Website at [www.futurecity.org](http://www.futurecity.org) to learn more.

*Introduce a Girl to Engineering Day.* E-Week co-chairs IBM and NSPE are challenging engineers across the nation to introduce girls to the profession on the first annual Introduce a Girl to Engineering Day, Thursday, 22 February 2001. This unique project will require everyone's help. For more information on how to get involved, visit <http://www.eweek.org/2000/DiscoverE/girls.shtml>

Sure, everyone knows where the Brooklyn Bridge is. But, what about the nation's not-so-famous engineering wonders - like the looping roller coaster at your local amusement park or the ski lift at your favorite ski resort or that neat, old lighthouse on the coast?

*A Sightseer's Guide to Engineering* will help you find all of the above. More than just a listing of the obvious engineering wonders across the country, this Guide is absolutely essential to the travel enthusiast with a taste for the technologically sublime. The National Society of Professional Engineers (NSPE) is creating this

### Winter/Spring 2001 Telecommunications Short Courses

- **Preparing for 3G Wireless Technology:  
New Wideband CDMA/TDMA Standards and Systems,**  
*February 19-21, 2001 in Madison, WI*
- **Using and Installing Fiber Optic Systems for  
Communications,** *February 26-28, 2001 in Madison, WI*
- **Fundamentals of Data Communications,**  
*March 5-7, 2001 in Madison, WI*
- **Siting Wireless Communications Antennas and Towers**  
*March 12-14, 2001 in Las Vegas, NV*
- **DC Power System Design for Telecommunications,**  
*March 27-29, 2001 in Madison, WI*

For further information...

Web: [epdweb.engr.wisc.edu](http://epdweb.engr.wisc.edu) or E-mail: [danbeck@engr.wisc.edu](mailto:danbeck@engr.wisc.edu)

unique travel guide so that both adults and kids make sure they add some engineering achievements and activities to their vacation itineraries. NSPE is currently considering sites for use in the Guide. Do you have a site you think would be appropriate? Visit: <http://www.eweek.org/nspe/engineeringsights/>

### Electronic Engineer

Join a multidisciplinary group of basic and applied researchers who study novel means to communicate information via the sense of touch. We seek an individual with a BSEE or equivalent with demonstrated experience in:

- Electronic device development from specification through physical prototype
- Analog and digital hardware design
- Microcontroller design and microcode
- Printed circuit design (rigid and flex)
- Windows application programming

The ideal candidate will be able to easily shift between several projects having changing goals and priorities in a flexible, casual workplace. Position available 1/1/01-6/30/01 (possible extension contingent on funding) for 25-100% appointment, salary \$32,000-62,036 depending on qualifications and experience. Please email resume (inline or attached) to Kurt Kaczmarek, [kakaczma@facstaff.wisc.edu](mailto:kakaczma@facstaff.wisc.edu). For more information please see <http://kaz2.med.wisc.edu/>. The University of Wisconsin is an equal opportunity/affirmative action employer. UW position vacancy 38638.



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Our members have professional interests in computers, power engineering, signal processing, communications, industry applications and a number of other technical fields.

**For more information, contact John Hicks at (608) 233-4875 or [jhicks@facstaff.wisc.edu](mailto:jhicks@facstaff.wisc.edu).**

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