



# Wavelengths



**November/  
December  
2002**

**Vol. 42, No. 3**

*Wavelengths* is a publication of the Southeastern Michigan chapter of the Institute of Electrical and Electronic Engineers.

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## **Invitation To Serve as IEEE/SEM Officer and Call For Nominations**

*Dr. Maurice Snyder, Section Chair*



It's time to look ahead for our leadership for the 2003-2004 program year. If the new Section bylaws pass as expected the program year will change from "July to June" to "January to December" to conform with IEEE HQ and with most other Sections in the U.S.

The IEEE/SEM Executive Committee (Xcom) invites you to consider and discuss opportunities in leadership at the Section or Chapter level with any of our officers. We invite you and any of your colleagues to join us in dinner at any of our regular Xcom meetings, the first Monday of each month at U of M, Dearborn. The dates of and directions to the Xcom meetings are announced on our Section web site: [http://ewh.ieee.org/r4/se\\_michigan/main.php](http://ewh.ieee.org/r4/se_michigan/main.php).

As we have noted in the past, serving as an IEEE/SEM Xcom or Chapter officer is an excellent opportunity to meet and work with enthusiastic and proactive section members. It's a way to network with local professionals, meet internationally known experts, and have fun while growing professionally. Terms of office start on July 1 and are for 1 year for all Section and Chapter officers. Terms for Section Directors also start July 1 but are for two years. If the new bylaws pass, as expected, the terms' starting date will change from July 1 to January 1.

Consider becoming active in one of our 11 Chapters. Chapters are technology focused groups that have regular scheduled meetings with speakers in their technical area. A description of each of the Chapters is given on our SEM web site with the contact name of each Chapter chairman. Consider attending a technical meeting in the chapter of your interest - it's an excellent way to meet colleagues in your technical area and learn more about IEEE in Southeast Michigan.

### **Call For Nominations**

Nominations' deadline for Section and Chapter officers and Section Directors is January 15th, 2003. You can nominate yourself or someone else or have someone else nominate you. The online forms for nominations can be found on our web site: [http://ewh.ieee.org/r4/se\\_michigan/admin/main.php](http://ewh.ieee.org/r4/se_michigan/admin/main.php).

IEEE/SEM Section Officers/Directors

**Editor:**

[Dan Romanchik](#)

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[ieee.org](http://www.ieee.org)

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IEEE Southeast  
Michigan Chapter

**Deadline for the  
November issue  
is December 29!**

- Chair
- Vice-Chair
- Secretary
- Treasurer
- Educational Activities Director (2 year)
- Student Activities Director (2 year)
- Membership Director (2 year)
- Professional Activities (2 year)
- Technical Activities (2 year)

Chairs, Vice Chairs and Secretaries for IEEE/SEM Chapters

Chapter 1: Circuits & Signal Processing

Chapter 2: Vehicular Technology

Chapter 3: Comm. & Aero. Electronics

Chapter 4: Trident

Chapter 5: Computers

Chapter 6: Geoscience & Remote Sensing

Chapter 7: Power Eng. & Ind. Apps.

Chapter 8: EMC

Chapter 9: Power & Ind. Electronics

Chapter 10: Engineering Management

Chapter 11: Engrg. in Medicine & Biology

The duties of officers can be found [here on our web site](#).

Please [contact me](#) to learn more about serving in any of the officer positions mentioned above or to be invited to dinner at our Xcom meeting. Remember nominations need to be made by is January 15th, 2003.

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### **The IEEE/SEM Fall 2002 Section Meeting**

by Suleiman Barada, IEEE/SEM Vice Chair

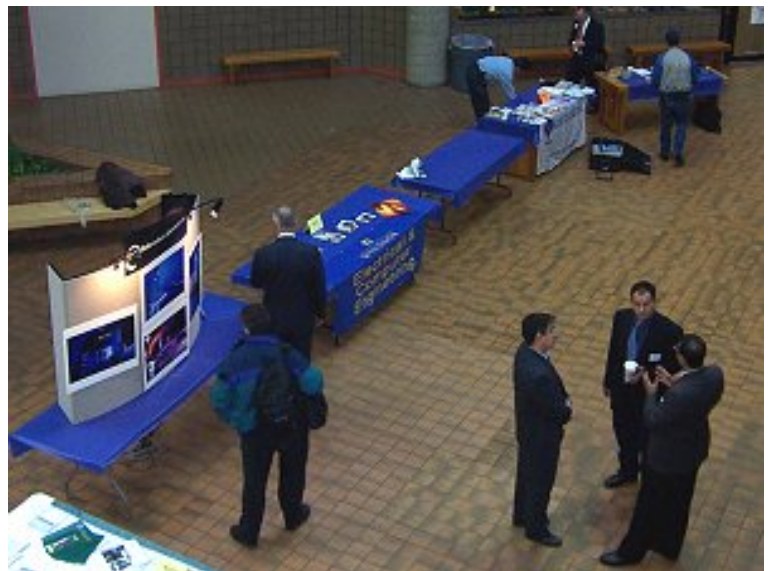
The IEEE/SEM Fall 2002 Section meeting was held on the 24th of October 2002, hosted and co-sponsored by our friends at Lawrence Technical University in Southfield, Michigan. Special thanks go to our LTU Host and Coordination SubCommittee comprised of Dr. Lisa Anneberg and Dr. Hassan Hassan for their pivotal role in securing LTU and making this event come true. On behalf of the IEEE/SEM executive committee, I extend our appreciation to Lawrence Technical University for co-sponsoring this event; an event that was characterized by many attendees as being quite a successful and exciting one, despite the hard economic and political conditions that engineers in particular and working and unemployed families in general, in South East Michigan, have been facing for more than a year and a half. The program committee was made up of dedicated individual volunteers who devoted many hours of preparation to make this meeting the outstanding event that it was. My sincere thanks go out to the senior planning committee, which consisted of:

Dr. Maurice Snyder Section Chair

Dr. Lisa Anneberg LTU Host & Coordinator  
Dr. Hassan Hassan LTU Host & Coordinator  
Scott Lytle Registration Activities  
Kimball Williams Brochure & Council  
Dr. Abbas Youssef Technical Activities  
Dr. Tarek Lahdhiri Professional Activities  
Dr. Mohamad Berri Membership Activities  
Dr. John Shen Educational Activities  
Chuck Albrecht Section Treasurer  
Don Bramlett Awards & Council  
Dr. Jim Woodyard Communications & council  
Dan Romanchik Webmaster & Wavelength  
Sat Basu Council  
Tony Rhein Section Secretary  
Dr. Suleiman Barada Program Committee Chair  
and Section Vice-chair

### **Registration and Attendance**

Lawrence Technical University allowed us to completely take over their entry lobby to the Management Building and set up registration tables in the main floor area. Special thanks go to our Registrar Scott Lytle, and our Treasurer Chuck Albrecht, who spearheaded the whole registration process from beginning to end with a high sense of dedication and professionalism. Special thanks also go out to our student chapter volunteers from Lawrence Technical University. They helped with registration, kept everyone almost on time and in place for the evening's events, took photographs of all of the events and chapter and keynote speakers, and helped participants find their way to chapter meetings and the banquet area. Thank you to all the Student Chapter members who were able to join us. We had a total of 160 member attendees at this event. Guests included our keynote speaker, our technical session speakers and their guests and our student awardees.



The registration table and company exhibits were set up in the main lobby of Lawrence Tech's Management Building.

### **Exhibitors**

Before and after the technical sessions attendees had the opportunity to visit vendor displays and student branch exhibits. All the displays and exhibits were set up in the main floor area of the Management building, next to the banquet facilities. Thanks to the efforts of Dr. Tarek Lahdhiri, this meeting set the record for the largest participation of vendors, university showcases and student table sponsors at a Section meeting. The following companies and universities joined us

for the evening:

### **Companies**

- dSPACE, Inc., Novi, MI. Contacts: Larry Bihn, Andrew Dunlap. Phone: 248-567-1229. Fax: 248-567-0131.
- Mechanical Simulation Corp., Ann Arbor, MI, Contacts: Doug Orrin, Mike Sayers, Haicen Zhang. Phone: 734-668-2933. Fax: 734-668-2877.
- Applied Dynamics International, Ann Arbor, MI. Contacts: Ken Waichunas, Rick Schlosser. Phone: 734-973-1300. Fax: 734-668-0012.
- Vector CANtech, Inc., Novi, MI. Contact: Bruce Emaus. Phone: 248-449-9290. Fax: 248-449-9704.
- Underwriters Laboratories, Novi, MI. Contact: Robert Neff. Phone: 248-427-5328. Fax: 248-427-5360. Web: [www.ul.com/emcautomotive](http://www.ul.com/emcautomotive).
- Tec-Ed, Inc., Ann Arbor, MI. Contact: [Stephanie Rosenbaum](#). Phone: 734-995-1010, Fax: 734-995-1025. Web: [www.teced.com](http://www.teced.com).
- Lawrence Technological University, Southfield, MI. Contact: [Dr. Richard Maslowski](#). Phone 248-204-2500. Web: [www.ltu.edu](http://www.ltu.edu).

### **Universities**

- University of Michigan - Dearborn. Contact: Dr. Subrata Sungupta. Phone: 313-593-5290.
- Michigan State University. Contact: Dr. Tim Hogan. Phone: 517-432-3176.
- [University of Detroit - Mercy](#). Contact: Dr. Nizar Al-Holou. Phone: 313-993-3365.
- [Wayne State University](#). Contact: Dr. James Woodyard. Phone: 313-577-3758.
- [University of Windsor](#). Contact: Dr. Tarek Lahdhiri. Phone: 810-947-2398 .

We thank all the companies and organizations for their participation and look forward to seeing them again at our Spring meeting in March 2003.

### **Technical sessions**

The eight technical sessions plus the student track session were held in Lawrence Technical University meeting rooms. The keynote address was conducted at the banquet facility. The list of all of these technical sessions is shown below.

- **KEYNOTE ADDRESS:**  
"Dual/Higher Voltage - a Global Opportunity" by Norman Traub, Director of 42 V Initiatives, SAE International.
- **Chapters 1, 3:** "Embedded Information System

Technology for Interoperability of Aerospace and Command and Control (C2) Platforms" by Charles P. Satterthwaite Air Force Research Laboratory, Wright-Patterson AFB, OH.

- **Chapter 2:** "Lean-Burn Technology for Spark Ignition Engines - A Perspective on Opportunities and Challenges" by Gopichandra Surnilla, Ford Motor Company.
- **Chapter 4:** "Autonomous Robotics - A Wonderful Motivator in AI research and Science & Engineering Education" by Chan-Jin Chung, Lawrence Technological University
- **Chapter 5:** "Embedded Software Development for Automotive Applications" by Pradeepan Srinivasan, General Motors.
- **Chapter 7:** "Substation Integration and Automation" by John McDonald, KEMA Consulting.
- **Chapter 8:** "Testing above 1 GHz - Site Considerations" by Mike Windler, Underwriter's Laboratories.
- **Chapter 9:** "Super Junction Power Semiconductor Devices and Their Impact on Power Electronic Systems" by Dr. John Shen, University of Michigan--Dearborn.
- **Chapter 10:** "Tank-Automotive and Armaments Command (TACOM) Leadership and Philosophy" by Randal C. Gaereminck, U.S. Army.
- **Student Track:** "Creativity and Innovation for Electrical and Computer Engineering Research Using TRIZ Theory" by Dr. Hassan Hassan, PE, Lawrence Technological University.



Norman Traub delivers the keynote speech at the Fall Section Meeting.

### **Dinner**

One hundred thirty one meals were served at dinner. We want to thank the seven companies who sponsored student branch tables at this event. They were: dSPACE Inc., Mechanical Simulation Corp., Applied Dynamics International, Vector CANtech Inc., Underwriters Laboratories, Tec-Ed Inc., Lawrence Technological University. Thank you to all the companies and their representatives who participated in this meeting.



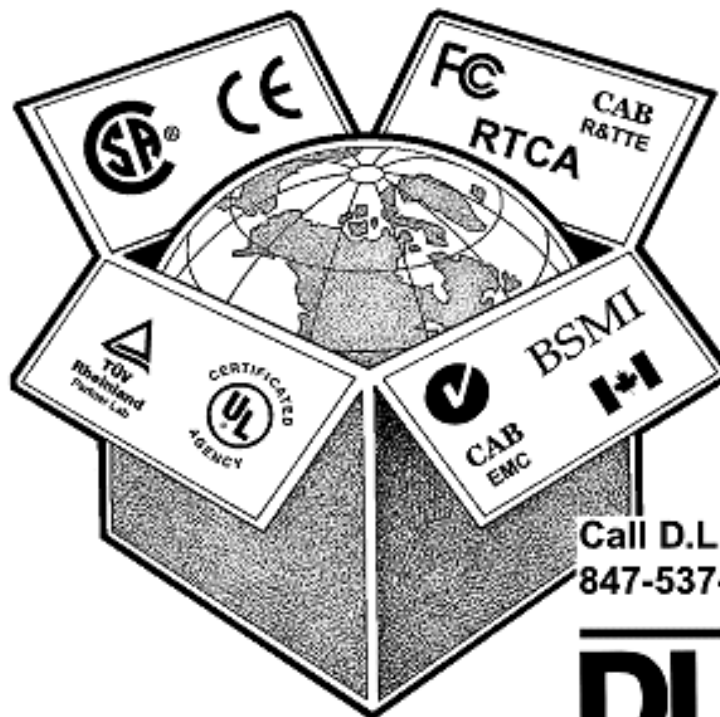
**More than 130 people enjoyed the buffet.**

You really helped make this an exciting evening to remember. During dinner, a number of exciting short speeches were made by: Dr. Charles Chambers (president of LTU), Dr. Maurice Snyder (Chair of IEEE/SEM), Dr. Lisa Anneberg (LTU Host & Coordinator), Dr. Tarek Lahdhiri (Director of Professional Activities), Sat Basu (council), and Don Bramlett (Awards & Council ). The keynote address was delivered by Norman Traub who presented an exciting and highly informative speech on "Dual/Higher Voltage - a Global Opportunity". The speakers were introduced by Dr. Suleiman Barada. Event surveys were distributed to all attendees for evaluation and feedback. IEEE/SEM also had the privilege of acknowledging Lawrence Technological University IEEE Student Branch for its assistance in this IEEE Fall Section Meeting. Again, my sincere thanks go to every person who contributed to the success of our Fall 2002 Section Meeting.

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## **On Frequency**

### **Riding the Wave or Drifting With the Tide?**

Back when I was an engineering student, digital electronics was all the rage. The microprocessor was a recent invention and the first microcomputers—including the Altair and the Commodore PET—had just been introduced. At the time, many of us downplayed the need to study analog electronics. It was clear that the future was going to be digital, and we all wanted to be part of the new wave of digital design engineers.

And what a wave it has been. In the past 25 years,



we've seen incredible advancements. Microprocessors were 8-bit devices running at clock rates at or near 1 MHz. Now, we have 32-bit devices running at more than a GHz.

But is it possible that the tide is turning? A recent study by Allied Business Intelligence of Oyster Bay, NY points out that wireless technology is slowly pervading society.

The study points out that 2.5G and 3G cellular networks are only the beginning as companies begin to deploy wireless local area networks (WLAN), Bluetooth, radio frequency identification (RFID) and even ultra wideband (UWB) networks. ABI predicts that the revenues generated by these technologies will likely exceed \$33 billion by 2007. That's a lot of wireless.

Of course, these new technologies are not simply analog electronics-they are a combination of digital and analog electronics. It is the "convergence" of the two technologies that makes them so successful.

Electrical and electronics engineers will also be successful when they extend and combine their skills. By taking advantage of what you already know and continually learning new skills and learning about new technologies, you'll be able to take advantage of the opportunities presented in the future. Instead of just drifting along, you'll be riding the wave.

**Dan Romanchik, Editor**

Agree or disagree, let me know! E-mail [d.romanchik@ieee.org](mailto:d.romanchik@ieee.org) with your views on this or other matters affecting your work or your career.

### **IEEE PES Substations Committee 2002 Annual Meeting**

*by John McDonald, Chair*

The IEEE PES Substations Committee held its Annual Meeting in Dearborn, Michigan on April 28 to May 1, 2002 at the Hyatt Regency Dearborn, located near historic Greenfield Village, the Henry Ford Museum and Ford Motor Company Headquarters. The meeting began on Sunday evening, April 28, with a welcome reception. The general membership meeting was held on Monday morning, with a status report by Chair John McDonald of KEMA Consulting; a preview of next year's Annual Meeting in Sun Valley, Idaho by Host Committee Chair John Oglevie of Power Engineers; a presentation on the communications security work being done by IEC TC57 WG15 by Convenor Herb Falk of Sisco; a presentation on Disaster Recovery at the Ford River Rouge Complex by Cindy Norlin of DTE Energy, and a discussion of the 2002 PES Goals by PES President John Estey of S&C Electric Company. After John's presentation there was a question/answer session for the Substations Committee membership to ask John questions about various aspects of PES.

In addition to the standards work that is accomplished, the Annual Meeting recognizes members who have made significant contributions to the Substations



Committee's work efforts. We are all volunteers who do much of this work on our own personal time. The Awards Luncheon on April 29 recognized these contributions. Wayne Litzenberger of Bonneville Power Administration, Chair of our Recognition and Awards Subcommittee, put together the Awards Luncheon Program, which followed the general membership meeting. The guest speaker was Edward Jakubiak, Director of Engineering and Planning for DTE Energy Distribution Operations. Ed was assisted by Haukur Asgierson, Supervising Engineer for Distributed Generation for DTE Energy Distribution Operations. Jim Evans of The St. Claire Group chaired the Host Committee for the meeting. Jim recognized other members of his Host Committee: Tom Powell, Vice Chair, from Tetra Tech MPS; Brian Harrington, Secretary, from Engle-Klaes Company; Don Bramlett, Treasurer, from DTE Energy Fossil Generation; Chuck Albright, Registration, from Patrick Engineering; Dennis DeCosta, Sponsorship, from Commonwealth Associates, Inc.; and Sharron Hoscila, Companion's Events.

The Substations Committee Distinguished Service Award was given to Jim Evans, for his 15+ years of service including five years as Chair of the Data Acquisition, Processing and Control Systems Subcommittee. PES President John Estey assisted Substations Committee Chair John McDonald in giving Jim this PES-level award.

Each member of the Thyristor Controlled Series Capacitors Working Group, chaired by Duane Torgerson, in the High Voltage Power Electronics Stations Subcommittee, received a Certificate of Appreciation for contributions leading to their Recommended Practice for Specifying Thyristor Controlled Series Capacitors. In addition to Duane, and Secretary Wayne Litzenberger, the members include Bharat Bhargava, Hubert Bilodeau, Todd Campbell, Aty Edris, Carlos Gama, Victor Gor, Richard Haas, Edward Horgan, John Joyce, Lutz Kirschner, Gerald Lee, Ben Mehraban, Nick Miller, Jan Samuelsson, Hector Sarmiento and Bo Wickstrom.

Each member of the Reliability of HVDC Converter Stations Working Group, chaired by John Hormozi, in the High Voltage Power Electronics Stations Subcommittee, received a Certificate of Appreciation for contributions leading to their Guide for Reliability of HVDC Converter Stations. In addition to John, and Vice Chair Gerhard Juette, the members include Jacques Allaire, Ben Damsky, D. Jack Christoffersen, Charles Heising, William Liverant, Duane Torgerson, Ivars Vancers and Gene Wolf.

Each member of the Electric Network Control Systems Standards Working Group, chaired by John Tengdin, in the Data Acquisition, Processing and Control Systems Subcommittee, received a Certificate of Appreciation for contributions leading to the reaffirmation of Standard Electrical Power System Device Function Numbers and Contact Designations. In addition to John, the members include William J. Ackerman, Jeff Benach, Robert S. Cartledge, Jr., Dennis Carr, Mason Clark, Robert Corlew, Steve Dalyai, Michael J. Dood, Kevin G. Easley, James W. Evans, Ron J. Farquharson, James Gardner, Dennis K. Holstein, Leland Jacobson, Marc Lacroix, Greg Luri, Wally Prystajacky, Peter Raschio, James W. Recchia, Sam C. Sciacca, H. Lee Smith, Robert C. Sodergren, Michael Thesing, Michel Toupin, Tom Wilson and Deryk Yuill.

Individual Certificates of Appreciation were given to D. Jack Christoffersen, Kevin Easley, Dennis Carr, John Tengdin, Herbert Falk, Cindy J. Norlin, Edward A. Jakubiak, Haukur Asgeirsson, James W. Evans, Thomas Powell, Brian Harrington,

Donald Bramlett, Charles Albright, Dennis DeCosta and Sharon J. Hoscila. In addition, active IEEE PES Fellow Grade Members in the Substations Committee were recognized.

The Subcommittees, their Working Groups and Task Forces met on April 29 to May 2 to continue their standards preparation work. This work is in the areas of data acquisition, processing and control systems; transmission and distribution; West Coast considerations; environmental effects; high voltage power electronics substations; and gas insulated substations. In addition to the Working Group, Task Force and Subcommittee meetings, there were two technical tours, an evening social event and companion activities.

The technical tours included a visit to the Fairlane Estate Power House. The Fairlane Estate was the residence of Henry Ford, one of the fathers of mass production and the automobile industry. Fairlane, as with many of Henry Ford's endeavors, was entirely self-contained, and is considered an early approach to distributed generation. The second technical tour, titled Energy Now - Distributed Generation, was held at the Hyatt Hotel by DTE Energy Technologies and included Live Energy (now System Operations Center™) demonstration, presentation on fuel cell use for substation control backup, description of Detroit Edison programs that support the grid and benefit customers, and a discussion on other distributed generation technologies.

The Tuesday evening social event was a banquet in the Eagle Tavern at Henry Ford Museum Greenfield Village, an authentic 1850's roadside tavern on the former Detroit to Chicago road. As part of the banquet program attendees were treated to private viewing of Thomas Edison's Menlo Park Laboratory, moved to the village by Henry Ford along with 31 rail cars of New Jersey soil to satisfy Edison that the laboratory would never leave New Jersey. Detroit's first power plant, Station A belonging to The Edison Electric Illuminating Co (predecessor of Detroit Edison), was also opened for the program. Tours through these exhibits were narrated by two of the museum's curators. The companion activities showcased the Dearborn region and Detroit's "east" side.

We welcome your participation in the Substations Committee. Please visit our web page at <http://www.eti-systems.com/IEEE>, and contact one of our officers by email with any questions or for further information.

The officers of the Substations Committee are John McDonald, KEMA Consulting, Chair; A.P. Sakis Meliopoulos, Georgia Institute of Technology, Vice Chair; and Hanna Abdallah, Arizona Public Service Company, Secretary. The officers speak for the entire committee in thanking the Host Committee and the support of their companies for their dedication and efforts in planning and carrying out a very successful meeting!

## **IEEE-USA President Describes Threats Facing U.S. Engineers at Summit on the U.S. Science and Engineering Workforce**

WASHINGTON (2 December 2002) - IEEE-USA President LeEarl Bryant pointed to recent sharp increases in engineering unemployment and declining real wages as serious threats to the long-term viability of U.S. engineering careers at the National Academies' Pan Organizational Summit on the U.S. Science and Engineering Workforce last month.

Bryant expressed serious concerns about the potentially adverse, long-term effects of workforce utilization practices that are making engineering jobs less secure and engineering careers more tenuous than ever. She cited the increasing reliance by employers on temporary foreign workers, non-standard employment arrangements and outsourcing of engineering work to lower cost, offshore locations. Non-standard employment arrangements utilize contingent, part-time, or contract workers instead of regular, full-time employees to reduce labor costs and facilitate just-in-time delivery of high value-added products and services, Bryant explained.

Unfortunately, management's short-term emphasis on labor flexibility seems to be creating long-term disincentives to continuing participation by many of the nation's best and brightest in America's engineering enterprise, the IEEE-USA president said.

Many aspiring and experienced engineers, when confronted with the prospect of periodic unemployment and flat or declining real wages, are voting with their feet and opting for careers in fields that offer more long-term job security and higher real wages ? fields such as business administration, law and medicine.

Other important issues highlighted by the IEEE-USA president included the need to: provide timely information on engineering labor market conditions; strengthen math and science education in grades K-12; expand engineering educational and employment opportunities for women, minorities, handicapped and older Americans; improve lifelong learning (continuing education) for practicing engineers and scientists; and reform the nation's educational and employment-based immigration system.

For the entire work, go to <http://www.ieeeusa.org/forum/POLICY/12nov02.pdf>.

The 11-12 November invitational meeting was hosted by the National Academies' Government-University-Industry Research Roundtable (GUIRR) and attended by representatives from more than 40 national organizations, including business associations, educational institutions, government agencies and professional societies. Its purpose was to enable stakeholders to identify causes and recommend solutions to problems affecting supply and demand for U.S. scientists and engineers. For more information on GUIRR, go to <http://www7.nationalacademies.org/guirr/>.

IEEE-USA is an organizational unit of The Institute of Electrical and Electronics

Engineers created in 1973 to promote the careers and public-policy interests of the more than 235,000 electrical, electronics, computer and software engineers who are U.S. members of the IEEE. The IEEE is the world's largest technical professional society. For more information, go to <http://www.ieeeusa.org>.



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**Consultants Unite!**

An IEEE Southeast Michigan Consultants Network is in the planning stages. The focus of the group will be to provide professional support and networking opportunities for independent consultants and contract engineers in the Southeastern Michigan area. Membership in the IEEE is not required. Please [contact Mike Honner](#) for more information if you are or would like to be an independent consultant or contract engineer.

## Calendar Of Events

To have your event listed here, [submit this form](#).

Monday, January 6, 2003 Executive Committee (Xcom) Meeting

**Location:** Univ. of Michigan, Dearborn,  
Professional Education Center Bldg, PEC 1420.  
[directions](#)

6:00pm - Dinner  
6:30pm - Meeting

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Friday,  
January 24, 2003

DSP in Automotive Embedded Systems  
Subra Ganesan

**Location:** Oakland University, Dodge Hall, Room 238  
**Time:** 4:00 - 5:00 pm

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Monday, February 4, 2003 Executive Committee (Xcom) Meeting

**Location:** Univ. of Michigan, Dearborn,  
Professional Education Center Bldg, PEC 1420.  
[directions](#)

6:00pm - Dinner  
6:30pm - Meeting

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## Executive Committee

### Officers

<b>Chair</b>	Maurice Snyder	734- 973- 1300	<a href="mailto:snyder@adi.com">snyder@adi.com</a>
<b>Vice Chair</b>	Suleiman Barada	313- 561- 5747	<a href="mailto:s_barada@msn.com">s_barada@msn.com</a>
<b>Secretary</b>	Anthony Rhein	734- 591- 4000	<a href="mailto:ajrhein@moylaneng.com">ajrhein@moylaneng.com</a>

<b>Treasurer</b>	Chuck Albrecht	734- 632- 1192	<a href="mailto:calbrecht@patrickengineering.com">calbrecht@patrickengineering.com</a>
<b>Administrative Activities</b>			
<b>Past Chair</b>	Dr. John Miller	313- 322- 7486	<a href="mailto:jmille24@ford.com">jmille24@ford.com</a>
<b>Section Advisor</b>	Mr. Don Bramlett	313- 235- 7549	<a href="mailto:d.bramlett@ieee.org">d.bramlett@ieee.org</a>
<b>Student Activities</b>	Dr. Hassan Hassan	248- 380- 1650	<a href="mailto:h.hassan@ieee.org">h.hassan@ieee.org</a>
<b>Professional Activities</b>	Dr. Tarek Lahdhiri	810- 947- 2398	<a href="mailto:tl007@ieee.org">tl007@ieee.org</a>
<b>Technical Activities</b>	Abbas Yousef		
<b>Educational Activities</b>	Dr. John Shen	313- 593- 5525	<a href="mailto:johnshen@umich.edu">johnshen@umich.edu</a>
<b>Membership</b>	Dr. Mohamad Berri	313- 999- 3358	<a href="mailto:berri@mberri.com">berri@mberri.com</a>

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### **IEEE/SEM Chapters**

Chapter I- Circuits and Signal Processing

[Chapter II - Vehicular Technology](#)

Chapter III - Communications and Aerospace Electronics

Chapter IV - Trident

Chapter V - Computer

Chapter VI - Geoscience and Remote Sensing

Chapter VII - Power Engineering and Industrial Applications

[Chapter VIII - EMC](#)

Chapter IX - Power Engineering and Industrial Electronics

## Chapter X - Engineering Management

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### **Advertising in Wavelengths**

Wavelengths is published eight times a year and sent to more than 3,500 members. These readers are responsible for specifying and purchasing a wide range of electronics components, equipment, and services.

#### **RATES**

<b>Equivalent Print Ad</b>	<b>Size in Pixels (max)</b>	<b>Annual Rate (8 issues)</b>	<b>Single Issue Rate</b>
Full Page	540W x 720H	\$4000	\$650
Half Page	270W x 720H	\$2000	\$325
	540W x 360H	\$2000	\$325
Third Page	180W x 720H	\$1500	\$250
	540W x 240H	\$1500	\$250
Quarter Page	270W x 360H	\$1000	\$175
Eighth Page	270W x 180H	\$500	\$90

There is no extra charge for color. Special placements can be requested, and will be accommodated if possible. Payment must accompany insertion order.

For more information, contact Dan Romanchik, Wavelengths Editor, phone 734-930-6564, e-mail: [d.romanchik@ieee.org](mailto:d.romanchik@ieee.org).