



IEEE Pittsburgh Section



Bulletin

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All announcements for publication in a particular month's bulletin are due to the Editor by the 20th of the previous month. The accuracy of the published material is not guaranteed. If there is any error, please bring it to the Editor's attention. The Section's web site www.ewh.ieee.org/r2/pittsburgh has past issues of the bulletin and lots of other useful information

• *From the Chair*

Greetings, friends. I hope you are all doing well.

The Pittsburgh Section will be holding an evening meeting at the University of Pittsburgh in Greensburg March 28. This meeting will include a technical talk, dinner, and the monthly executive committee meeting. In the afternoon, SSIT will be holding a technical meeting. This could be a great opportunity for a “two for one” bonus. Please see the announcements in this bulletin and consider attending both meetings.

We still have some open committee positions. Please let me know if you are interested in serving on a committee. Our Section grows through your contributions and involvement, so please consider becoming more involved.

The annual History Dinner is also announced in this bulletin. To ensure we have the right number of meals, we will be setting a deadline for payment for your dinner, and will not be able to accept any reservations after that deadline. The talk will be an interesting discussion about a subject that is important to all of us as engineers. Please get your reservations in early so you don't miss out!

As always, I welcome comments, concerns, or feedback. Please let me know what is on your mind.

Ralph Sprang
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2008 PES General Meeting Technical Program Chair – Dr. Kalyan Sen (Kal) senkk@ieee.org (724) 696-1611; General Chair - Dave Vaglia (see above)

- ***Patterned Nanomagnetic Bits and Devices***

Speaker: Bruce D. Terris, Hitachi Global Storage Technologies
Place: Seagate Research Center Auditorium
Date: Wednesday, March 5th, 2008
Time: Social (w/ Lunch served): 11:45AM, Technical Program: 12:15 PM

This meeting will be of particular interest to the members who belong to **IEEE Magnetics Society**, and others are also very welcome. Please RSVP to Ganping.Ju@Seagate.com to help us prepare the lunch.

Abstract: As conventional magnetic recording technology extends to ever higher areal density, it is possible the often predicted, and constantly increasing, density limit will be reached. This limit will likely be in the range of 750 – 1000 Gb/in². The use of nanofabrication to create patterned magnetic elements, or patterned media, is one of the proposed approaches with the promise of delaying the onset of superparamagnetism and thus enabling higher areal density. I will discuss many of the challenges that must be overcome for patterned media to be successful, including fundamental physics and material science issues, new fabrication technologies, nm-scale manufacturing tolerances, and low cost budgets.

One of these challenges is to controllably reverse one magnetic element, or bit, without affecting the neighboring elements. A narrow anisotropy distribution will be required, yet data suggest that as the element size shrinks, the distribution widens. This distribution arises from a number of sources, including shape and size distributions, edge effects, variations in the full film anisotropy and magnetostatic fields from neighboring elements. As will be discussed, understanding and controlling the switching properties of magnetic nanostructures is critical not only for patterned media, but for device applications such as MRAM cells and spintronic devices and, for current induced as well as field induced reversal.



Bio: Bruce D. Terris received the B.S. degree in applied physics from Columbia University and the M.S. and Ph. D. degrees in physics from the University of Illinois at Urbana-Champaign. After receiving his doctorate, he was a post-doctoral fellow for two years at Argonne National Laboratory. In 1985, he joined IBM as a Research Staff Member at the Almaden Research Center, San Jose, CA, and subsequently joined Hitachi GST when it was founded in 2003 and where he is currently the manager of Nanostructures group. His research interests have included thin film superconductivity and magnetism, contact electrification of insulators, and new types of scanning probe microscopes (STM, AFM, near-field optical, etc.). His current research is on nanoscale patterning of magnetic structures, thermally assisted magnetic recording, novel approaches to high density data storage and spin torque

devices. He has co-authored over 90 refereed publications and been issued more than 20 US patents. He has recently served as program co-chair for Intermag 2006 and program chair for the Nanoscale Science and Technology Division of AVS for 2005. He currently serves on the Administrative Committees of the IEEE Magnetic Society and the MMM conference and will serve as US program

chair for InterMag 2008 and US Conference Chair for InterMag 2011 (Taipei). He is a Fellow of the APS and AVS, and is a member of IEEE.

Directions to Seagate Research Center:

Seagate Research Center is located at 1251 Waterfront Place, Pittsburgh, in the Strip District, across from the Heinz History Center and next to the Convention Center.

- ***Analytical Representation of Thermal Systems with Thyristors***

Speaker: Mathew S. Krisnosky
Date: March 12, 2008
Time: Social – 6:30 PM, Program – 7:00 PM
Place: Westinghouse Energy Center (see directions below)
Cost: No charge but RSVP required
Sponsors: Power Engineering Society/Industry Applications Society
RSVP: Contact Keith Sueker at ksueker@comcast.net by March 7, 2008

Abstract - The transient thermal characteristics of various combinations of SCRs and heat sinks can be analytically determined from electrical R/C networks, and these can be derived from simple experimental work on the particular heat sink. These networks can then be used to evaluate the transient behavior of other SCRs, duty cycles, and sink lengths. The heat sink networks can also be concatenated with SCR networks to yield a transient temperature rise at the SCR junction. Time periods from milliseconds to hours can be represented.

These analytical procedures are especially useful in evaluating the thermal performance of SCR and heat sink combinations under the pulsed conditions seen in welders, motor starters and similar apparatus. Temperature rises can be determined for a series of pulsed loads, and the networks will accommodate arbitrary current waveforms on the SCR. The electrical R/C networks involved can be analyzed by a set of simple equations and Euler integration. Procedures are described for generating these networks for both SCRs and heat sinks. Examples of experimental results and the corresponding analytical representations are included.

About the Speaker - Matthew S. Krisnosky (M'06) received his BSEET degree from the University of Pittsburgh in Johnstown in 2006. He is an Applications Engineer, Medium Voltage Products, for Benshaw, Inc. in Pittsburgh. His experience includes analysis of transient voltage conditions on power lines during motor starting and design of medium voltage motor starters.

- ***Neural Engineering: Developing Technology to Communicate Directly with the Brain***

Speaker: Prof. Douglas J. Weber, Ph.D., Department of Physical Medicine and Rehabilitation and Department of Bioengineering, University of Pittsburgh
Date/Time: Thursday, March 20, 2008; 5:50-6:00 pm—refreshments; 6:00-7:00 pm—seminar

Location: 360 Benedum Hall, University of Pittsburgh, Pittsburgh, PA 15261 (a campus map is available at <http://www.tour.pitt.edu/tour-firstmap.html>)
Sponsor: Engineering in Medicine and Biology Society, Pittsburgh Chapter

Abstract: Over the last 2 decades, advances in microfabrication and digital signal processing technologies have enabled the development of machines that interface directly with neurons in the brain, spinal cord and periphery. These so-called “neural interfaces” serve as bi-directional communication channels, allowing information to be read-out from the brain in the form of neural recordings or written-in via patterned electrical stimulation. We are exploiting these technologies for two purposes: 1) to advance our understanding of how the nervous system senses and controls limb motion, and 2) to develop advanced prosthetic devices that interface directly with the nervous system for control. The ultimate goal is to create neuroprosthetic limbs that literally look, feel, and function naturally, with user intention and state feedback communicated by a neural interface linking the prosthesis to the brain. The key to enabling this communication is to understand how neurons encode information. Fortunately, neuroscientists and engineers have made great progress in deciphering the language of the nervous system, and we are now able to “decode” information in real-time from measurements of neural activity. Conversely, electrical stimulation pulses can be patterned appropriately to stimulate sensory neurons, for example, to restore hearing to persons with profound deafness. My talk will review the progress made in both our fundamental understanding of neural coding and the technology for linking devices to the brain. In particular, I will focus on research in my lab aimed at understanding how sensory neurons encode information about touch and proprioception (i.e. sense of body position), but I will also highlight progress in other areas of neuroprosthetics research, including both animal studies and pre-clinical trials in humans.

Bio: Dr. Weber is an Assistant Professor in the Department of Physical Medicine and Rehabilitation at the University of Pittsburgh. He is also a faculty member in the Department of Bioengineering and the Center for the Neural Basis of Cognition. Dr. Weber received a B.S. ('94) in Biomedical Engineering from the Milwaukee School of Engineering and an M.S. ('00) and Ph.D. ('01) in Bioengineering from Arizona State University. He was a postdoctoral fellow ('01-03') and Assistant Professor ('03-'05) in the Centre for Neuroscience at the University of Alberta before joining the University of Pittsburgh. His primary research area is Neural Engineering, including studies of motor learning and control of walking and reaching with specific emphasis on applications to rehabilitation technologies and practice. Specific research interests include functional electrical stimulation, activity-based neuromotor rehabilitation, neural coding, and neural control of prosthetic devices. Currently, his research is supported by grants from the National Institute of Biomedical Imaging and Bioengineering (NIBIB), the National Institute of Neurological Diseases and Stroke (NINDS), and the US Army's Telemedicine and Advanced Technology Research Center (TATRC). Dr. Weber has been a member of IEEE EMBS since 1994 and a member of the Society for Neuroscience since 1995.

- ***Our Improbable Universe: The Evolution of Primordial Energy into Mind***

Speaker: Dr Michael Mallery, IEEE Fellow
Date: Wednesday, March 26, 2008
Time: Social 6:30 PM, Program 7:00 PM
Place: Westinghouse Energy Center

Cost: No Charge but RSVP Required by Wednesday March 19, 2008
Sponsors: Power Engineering Society/Industrial Applications Society.
Organizer: Dr. Kal Sen, P.E., senkk@ieee.org or 724-696-1611.

Ever stop to consider how unlikely it is you're here, now, doing what you are doing? Our "ordinary existence" is really extraordinary. From the most practical point of view, we really are "star children": the iron in the blood of our veins originated in a stellar explosion billions of years ago. How likely it is that all the myriad conditions for life would come together so precisely? Without positing or denying the existence of a Creator behind it all, the answer to that question is humbling and fascinating. Along the way, Dr. Michael Mallary, author of the book, will summarize the latest findings in cosmology - including string theory, high energy physics, and relativity.

About the speaker: Dr Michael Mallary received a bachelor's degree in physics from MIT in 1966 and a PhD in Experimental High Energy Physics in 1972 from the California Institute of Technology. He has co-authored 17 papers in this field. His thesis work was on CP Symmetry Violation. He did post doctoral work at the Rutherford Laboratory. He then taught physics at Northeastern University as an Associate Professor. As part of the High Energy Physics team there, he worked on experiment #439 at Fermi Laboratory which reported early evidence for the existence of the fifth quark. The interplay of CP Violation and the number of quark to produce the matter of our reality will be discussed in this talk.

In 1978 he worked on the design of superconducting and conventional magnets for industrial and research application at the Magnetic Corporation of America. He joined the Digital Equipment Corporation's effort to design thin film magnetic recording heads in 1980. Since then he has received 60 patents in magnetic recording and authored and co-authored 30 publications in the field. His work has made numerous significant contributions to the growth of magnetic recording density by a factor of 10,000 over the last 25 years. Notable among these are the Shielded Pole perpendicular write head; the Diamond high turns inductive head; and the use of a low ratio of bit density to track density for maximizing recording density.

Presently he is a Research Staff Member Senior Member at the Seagate Research Center in Pittsburgh working on advance recording technologies. In 2004 he published *Our Improbable Universe*, Thunder's Mouth Press, 2004, ISBN 1-56858-301-X. Also see ImprobableUniverse.com. This work traces the evolution of individual and collective mind out of the primordial energy of the Big Bang. The physics of this event is the subject of his presentation. For directions, please see page 9

- ***Unlocking the Utility Meter: A Perspective on Non-Traditional Energy Technologies for Homeowners & Businesses***

Speaker: Panel of Experts (see abbreviated bios below abstract)
Date: Friday, March 28, 2008
Time: Program begins at 1:00 p.m. Registrants will begin arriving 30 minutes earlier to pickup materials and to register for the limited Technology Tour which begins at 3:00.
Place: Program – Greensburg Garden Center, 951 Old Salem Rd, Greensburg PA 15601
Tour - Westmoreland Conservation District, 218 Donohoe Rd, Greensburg PA 15601

Cost: General: \$10; Members of IEEE or Pittsburgh Technology Council: \$8; Students: \$5
RSVP: **Pay before March 20 and deduct \$2**, else pay full price at the door. Mail check payable to IEEE-Pittsburgh Section to: Robert Watt, 7505 Diane Ave., N. Huntingdon 15642-2709. Register via E: rewatt@rcwatt.com or P: 724.864.9288
Sponsors: Society for Social Implications of Technology & Professional Activities Committee

Abstract: Advancing technology revolutionized the telecom industry and is now impacting the electric utility industry. You are invited to join the Pittsburgh Section of the Institute of Electrical and Electronics Engineers for a forum discussion, moderated by the founder of RC WATT (a leading provider of onsite power systems for homeowners), when a panel of industry experts converge on Greensburg to share their views on the implications of advanced and proven technologies in the areas of energy production and energy savings vis-à-vis “smart metering.” The first 75 to register at the Garden Center the day of the meeting may join us for a technology tour. Topics for the day include: Spinning the meter backwards, Automated Meter Reading, Renewable Energy Credits, Real Time Pricing, Windmills, Solar Power, Geothermal, Adaptive Reuse, and more.

Panelists (in alphabetical order):

Edward Johnstonbaugh: Board member of the West Penn Power Sustainable Energy Fund (www.wppsef.org) and a manager with the New York Power Authority.

Greg Phillips (leading tour, will not be on the panel): Conservation District Manager/CEO of the Westmoreland Conservation District (www.wcdpa.org) with oversight for the GreenForge project.

John Sala: Director of Marketing, Neptune Technology Group (www.neptunetg.com). John is responsible for large customer electric and gas metering software solutions at Neptune.

Gary Sheppard: County Director for Westmoreland’s Penn State Cooperative Extension (westmoreland.extension.psu.edu) which has installed solar and wind harnessing technologies.

George Uram: Vice President, Sensus Metering Systems (www.sensus.com), which has marketed the FlexNet Advanced Metering Infrastructure “AMI” to over 6 million utility endpoints.

Jennifer Young: Managing Director, Advanced Manufacturing Network and Cleantech Network, Pittsburgh Technology Council (www.pghtech.org).

For More Information about this or other upcoming Society for the Social Implications of Technology Events, contact: Joseph Kalasky, Chair: 724-838-6492, j.kalasky@ieee.org; Andrew Rydholm, Vice Chair: 412-983-2845, arydholm@ansoft.com; or Robert Watt, Treasurer: 724-864-9288, rcwatt@rcwatt.com.

- ***Executive Committee Meeting in Greensburg***

The monthly Executive Committee meeting of the Pittsburgh Section will take place after the above PACE/SSIT workshop in Greensburg. Details are:

Date/Time: Friday, March 28, 5:30 PM

Location: University of Pittsburgh at Greensburg; Chambers Hall; Room: Fireside Lounge

- ***The Importance Of Obtaining A PE License***

Speaker: Joseph M. DeSalvo, P.E.
Date: Wednesday, April 2, 2008
Time: Social 6:30 PM, Program 7:00 PM
Place: Westinghouse Energy Center (see directions below)
RSVP: Dr. Kal Sen, P.E., senkk@ieee.org or 724-696-1611 by March 27, 2008
Organizers: Power Engineering Society/Industrial Applications Society.

After receiving your degree in engineering, you started your career in Engineering. You and your family invested a lot of time and money and have made sacrifices to give you the opportunity to obtain your education and work experience. Common sense would tell you that it would be wise to purchase some insurance that would help protect the investment. The speaker will stress that taking the necessary steps to become a Licensed Professional Engineer is the insurance policy you need. Being a Professional Engineer, adhering to the Code Of Ethics and Rules of Professional Conduct, and making Continuing Professional Competency a part of your lifestyle will be the ingredients needed to protect your job and engineering career. In addition to the benefits of registration, the speaker will address the process for registration, the requirements, state laws, and the exams and how to prepare for them.



About the speaker: Joe DeSalvo is a Professional Engineer with degrees in electrical engineering (Pitt) and industrial management (Carnegie Mellon). He is a Senior Life Member of the IEEE and is presently on the adjunct faculty of Pennsylvania State University where he teaches FE (EIT) and P&P (PE) review courses and several engineering and economics courses in the Advanced Power Engineering Program. Mr. DeSalvo is retired from Allegheny Power, where, as Manager of Substation and Methods Standards, he had responsibility for substation designs and industrial engineering studies for three operating companies serving five states.

He has served the IEEE in over 60 positions at all levels during the last 40 years. He was the Chairman of Pittsburgh PES Chapter in 1975-76 when it received "Outstanding PES Chapter" award." He is a past Chairman of Pittsburgh Section and a past Director of Region 2. He received the IEEE Centennial Metal Of Honor in 1984. In addition to IEEE activities, Mr. DeSalvo is a senior member of the Institute of Industrial Engineers and a member of Eta Kappa Nu and Sigma Tau honorary societies.

- ***The FE Exam Review Course***

As a service to our community, the Pittsburgh PES/IAS Chapter, in partnership with Penn State New Kensington, is sponsoring a 26-week FE Review Course starting in April 2008. Participants will be prepared to take the FE exam in October 2008. To become a PE, one must pass two exams: (1) Fundamentals of Engineering (FE) Exam, formerly referred to as the EIT Exam and (2) Principles and Practice of Engineering (P&P) Exam, referred to as the PE Exam. Our local expert Joe M. DeSalvo, PE, who has been teaching Penn State Continuing Education classes for over 40 years, will teach this

review course. Usually the charge for such a course is over \$1000 per person. Because PES/IAS will be responsible for the publicity and for providing the classroom facilities, we can project that the cost will be in the range of \$575 per person (IEEE member or non-member) or \$500 without books if we have at least 25 participants. Classes will be held Wednesday evenings beginning April 16 at the Westinghouse Energy Center in Monroeville. Please indicate your interest by notifying Dr. Kal Sen, P.E. at senkk@ieee.org or (724) 696-1611 no later than April 9, 2008.

DIRECTIONS TO WESTINGHOUSE ENERGY CENTER

From Pittsburgh take Interstate 376 East (Parkway East). Take Exit 14A to Monroeville. Cross Business Rt 22 at the traffic light and proceed on Rt 48 South (Moss Side Blvd) approx ½ mile (two traffic lights). The 2nd traffic light is at a 4-way intersection with an Exxon station on the right. Turn left onto Northern Pike. Proceed approx 0.2 miles and turn right at the 1st traffic light onto Westinghouse Dr. Travel 0.7 miles (past the guard stand) to the 3 flags where the building's main entrance is located. Parking in the evening will be plentiful. Use the main entrance and check with the security guards inside. You will be directed to the proper room for your meeting.

From the PA Turnpike, take Exit 57 (Monroeville). After the toll plaza, get in the left lane to get on Business Rt 22 West. At the first light, turn left onto Rt 48 South (Moss Side Blvd) and follow the above directions.

• *Pittsburgh Regional Science Fair 2008 - Call for Volunteers*

Does “Robotic Navigation: Sensing Danger” and “How Interference Affects a Connection” grab your attention? Would you be surprised to know that middle school and high school students completed these projects? Are you the type of engineer that likes to interact with students? If so, then read on.

Volunteers are needed to represent the IEEE Pittsburgh Section at the Sci Tech 2008 Pittsburgh Regional Science Fair on April 4, 2008 at Heinz Field. Nearly 700 students from 90 schools in the 12 area counties are expected to compete.

The goal of the Science Fair is to advance science education by exhibiting examples of scientific research by some of the best and brightest students in our region. The goal of the Science Fair coincides with one of the missions of the IEEE, that is to foster an interest in the engineering profession.

The half-day event begins with lunch at noon, followed by judging of Junior, Intermediate and Senior Division projects, and concludes with presentation of two IEEE sponsor awards to Senior and Intermediate Division entries at approximately 4 PM.

To volunteer to be an IEEE judge for Sci Tech 2008, just email tom.dionise@ieee.org, and you will be given information on registration and included in future mailings.

• *Annual History Dinner - Mark Your Calendars!* ***Topic: America is Eating its Feed Corn***

Speaker: Dr. Richard Thompson, University of Pittsburgh, School of Information Science
Date: Thursday, April 24th, 2008
Time: 5:30 PM Social and Dinner; 7:00 PM Award presentations and speaker's presentation
Place: Church of the Ascension, Oakland (directions and details provided next month)
Cost: \$20 per member; \$35 member plus guest; NO CHARGE for program only.



Buffet provided by *The DEACON and Denise*

The history and awards dinner will be at a central location in Oakland this year. Details and directions will be provided next month. This is a great event to bring your spouse or significant other to. It's also a great opportunity to get together with your electrical engineering buddies you haven't seen in a while. Call them and make plans to attend the dinner and catch up with each other.

Abstract: America's economy has depended on innovation for the past 150 years, but our investment in innovation has declined over the last 15 years. The purpose of this talk is to explain this dependence and to alert the audience to a serious national problem before it becomes a national emergency. The rationale is historical, from the fall of Rome to Ford and Edison. But, we'll carefully track the last 60 years: from the "happy days" to Sputnik and OPEC and SDI and, finally, to our current "post-Wall" economy.

- ***IEEE Helps Make Engineers Week 2008 A Success***

Once again, the IEEE joined over 60 technical societies and companies and over 600 engineers to help make the 14th annual Engineer's Week at Carnegie Science Center a success for several thousand visitors. The IEEE sponsored a demonstration table with several simple electrical circuits for the children to wire.

According to Janet Henke, CSC Event several hundred children visited the IEEE table and wired a variety of circuits. IEEE members Charl van Wyk, Michael Driver, Craig Lang, Rich D'Ippolito, Qing Han, Mary Grace Cesarespada, Elnora Balsler, Mike Kelner, Chuck Urso, Jessica Kankoski and Steve Tubbs and Tom Dionise assisted the children with the circuit connections, and explained the electrical principles involved.

Many of the IEEE volunteers echoed similar sentiments: Seeing children with such curiosity and the desire to learn was extremely rewarding. The large number of youth involved in E-week was encouraging, especially since they represent our future engineers and scientists.



Jessica Kankoski and Chuck Urso assist the children in connecting circuits



Craig Lang and Rich D'Ippolito offer advice on creating lift with the fan motor

- ***Nanorobotics***

Part II.

Nanorobotic Manipulation

Robotic manipulation at the nanometer scale is a developing technology for handling, structuring characterizing , and assembling nano building blocks into nanoelectromechanical systems (NEMS).

Strategies for Nanomanipulation

The first nanomanipulation experiment was performed by Eigler and Schweizer in 1990 [5]. The experiment included a Scanning Tunneling Microscope (STM) operating at lower temperatures (4 K) to position individual xenon atoms on a single-crystal nickel surface with atomic precision. The manipulation performed fabrication of rudimentary structures of their own design, atom by atom. The experiment resulted in the famous set of images showing how 35 atoms were moved to form the three-letter logo IBM, demonstrating that matter could indeed be maneuvered atom by atom as Feynman suggested [6].

A nanomanipulation system generally consists of nanomanipulators as the positioning device, microscopes as eyes, various end effectors including probes and tweezers as its fingers, and types of sensors (force, displacement, tactile, strain, etc.) to implement manipulation and/or to determine the properties of the object. The key technologies for nanomanipulation include observation, actuation, measurement, system design and fabrication, calibration and control, communication, and human-machine interface.

Nanomanipulation processes consist of three general types: 1) lateral noncontact, 2) lateral contact, and 3) vertical manipulation. Lateral contact nanomanipulation is applied for atoms and molecules un ultra high vacuum (UHV) with an STM or bio-objects in liquid using optical or magnetic tweezers. Contact manipulation can be used in almost any environment, generally with an atomic force microscopy (AFM), but is difficult for atomic manipulation.. Vertical manipulatibn can be performed by nanorobotica manipulators (NRM)s.

Recent Applications of Nanorobotic Manipulation

Nanorobotic manipulation (NRM) is characterized by multidimensional Degrees of Freedom (DoF). This characterization includes position and orientation controls, independently actuated multi-probes, and a real-time observation system. NRM has been employed for the structuring and characterization of nano building blocks and for assembling nanodevices in 3-D space [7]-[11]. It has been applied on materials such as nanoparticles (0-D) and nanotubes (1-D or 2-D), nanobelts and nanofilms (2-D), and (3-D) nanostructures. Very special applications of NRM are in the manipulation of carbon nanotubes (CNTs) and 3-D helical structures. These CNTs are nanoelements with well-defined geometries, superior and exceptional mechanical properties, extraordinary electric characteristics. These outstanding properties, make CNTs desirable for many potential applications such as nanoelectronics, NEMS, and other nanodevices.

Conclusion

In spite of the present intensive research activities in the field of nanotechnology, the future of nanorobotics remains at this stage not well defined. On the other hand, nanotechnology is per se, progressing toward the construction of intelligent sensors, actuators, and systems that are smaller than 100 nm. These NEMS are the tools to be used for the fabrication of future nanorobots as well as the components from which these nanorobots may evolve. In the field of fabrication there will be the manipulation of nanoobjects with nanotools, measuring mass in (femto-gram) ranges, force-sensing at the (pico-Newton) scale, and the induction of GHz motion among other new possibilities yet to be discovered.

To Know More

Contact Bradley J. Nelson, Institute of Robotics and Intelligent Systems, ETH Zurich, ETH Zentrum, CLA H17.2, 8092 Zurich, Switzerland. E-mail: bnelson@ethz.ch

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- ***Career Survival for Engineers and Scientists in the 21st Century***

The Power Engineering Society and Industry Applications Society of the IEEE Pittsburgh Section is planning to have a 1-day career management seminar developed by the IEEE-USA Career & Workforce Policy Committee in cooperation with the IEEE-USA Employment and Career Services Committee on July 19, 2008, the Saturday before the PES General Meeting in Pittsburgh.

The goal of this seminar is to show you how to prepare yourself to manage or run your career in this era of globalization and selective hiring. Some topics to be discussed by the speakers include:

- Changes in the job market
- Requirements of the job market and how you relate to the market
- Adapting to new workplace
- Knowing personal weaknesses and strengths
- Starting a personal career plan, values statement and branding
- New methods of job searching
- Understanding the interview process
- How to use IEEE resources to help yourself to try new innovative job searches

If you are interested in enhancing your career by empowering yourself to work with management and human resources to innovate your own career in the 21st century, this is for you. The first step is to let us know if you have an interest in attending a seminar of this caliber. There will be a nominal fee for this seminar. Lunch will be provided. We need your response to have a count to have the proper venue. Please e-mail Andrew Novotny at andrewnovotny@ieee.org to reserve your place for this important seminar.

- ***2008 PES General Meeting -July 20-24, 2008-Call for Volunteers***

The 2008 PES General Meeting is coming to Pittsburgh! Allegheny Power and Duquesne Light are co-hosting this year's technical conference. Please join us in welcoming visitors from around the globe to the David L. Lawrence Convention Center July 20 - 24, 2008.

The Pittsburgh chapter of the PES/IAS is looking for your help. The local planning committee is seeking volunteers to staff a variety of positions to assure a smooth and orderly experience for all of the conference attendees.

Why volunteer?

Volunteers for this conference have the opportunity to participate with the conference technical sessions, tours and to welcome all of the visitors to Pittsburgh! Volunteers are offered the following benefits:

- No registration fee for meeting
- Can attend 1 day free for each day worked (e.g., if a volunteer works one day only, they can attend another day for free)
- Gets a volunteer shirt to wear on site
- Can attend any tour and any tutorial at the prevailing fee W/O having to pay the full meeting registration fee when off duty
- Lunch vouchers will be provided to those working volunteers who's work hours cover the noon-time hour
- Working Volunteers for tours do not pay the tour fee , including lunch, if a lunch is provided at that tour...

Contact Rich York, richyork@ieee.org, if you wish to participate in this event.

2008 Calendar – Meetings of IEEE Pittsburgh Section

	Jan	Feb	Mar	Apr	May	June	July	August	Sept	Oct	Nov	Dec
Executive Committee	17 - 7pm Panera Bread Oakland	21 - 7pm Panera Bread Oakland	28 – 5:30pm UP Greensburg									
Section		16 Engineers Week table		24 History Dinner								
Communi- cations		1 Contention Resolution										
Computer		16 Robot car race										
EMBS			20 <i>Neural Engineering</i>									
EMCS												
PES/IAS	16 - AdCom 6:00 PM 23 - Why not nuclear	20 - AdCom 6:00 PM Panera Bread Penn Center 13 – Intelligent Buildings 27 - Electric Vehicle	12 Thermal Systems 12 July 2008 PESGM LOC mtg; 26 Improbable Universe	2 Obtaining PE License 9 July 2008 PESGM LOC mtg	7 - July 2008 PESGM LOC mtg	12- July 2008 PESGM LOC mtg	9- July 2008 PESGM LOC mtg 19 Career Survival					
Magnetics			5 Nanomagnetic bits									
Robotics												
Signal Processing												
Social Impl of Technlgy			28 Utility Meter									
Upper Mon	28 Biomolecul ar Detection Device	4 Radio Astronomy										
Women in Engineering	10 Inaugural Meeting											
Life Member												
GOLD												
PACE												
Student Activities												