
January 2003

Rock River Valley Section

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Event

Sense

The Institute of Electrical and Electronic Engineers, Inc.

Computer/Control Systems Joint Chapter Meeting

The Role of Engineering in Nanotechnology

When January 30, 2003

Where Rock Valley College, Technology Center, Room 117. I90 to Riverside Blvd., exit and go west to Mulford Rd. Go south to first light, turn east into RVC. Follow road to left to last building.

Agenda

6:00 PM Social

6:30 PM Dinner

7:30 PM Presentation

Program Nanotechnology is a fast growing yet difficult to understand area of science and technology. The combination of advanced physics and material science has allowed for the manipulation of materials at the atomic and molecular level. Engineers want to understand both the commercial and intellectual aspects of nanotechnology. The success of nanotechnology will be determined by the ability of scientist's and engineers to commercialize discoveries. This talk will attempt to bring insight to an otherwise esoteric subject. Northern Illinois University is the location of the Laboratory of Nanoscale Science and Engineering Technology. The LNSET is a collaborative research center formed between EE and Physics to

promote practical uses of nanotechnology.

Speaker Dr. Michael

Haji-Sheikh joined the Faculty of the Northern Illinois University Electrical Engineering Department and is a researcher at NIU's MRDL (Microelectronics Research and Development Laboratory) and LNSET (Laboratory for NanoScale Science and Engineering Technology). He joined NIU's faculty after spending 9 years at Honeywell's Sensor Fabrication Facility in Richardson Texas. Dr. Haji-Sheikh has developed with his

and several more pending. He graduated from the University of Texas at Arlington in 1993 with an Interdisciplinary PhD in Engineering with his specialties being Electrical Engineering and Materials Science. Prior to obtaining his Ph.D., Dr Haji-Sheikh worked two years for the Composite Materials Test Laboratory at Bell Helicopter where he was involved with the full scale development program for the V-22 Osprey. Dr. Haji-Sheikh is a member of IEEE, The Electrochemical Society, & Tau Beta Pi.

Door Prizes

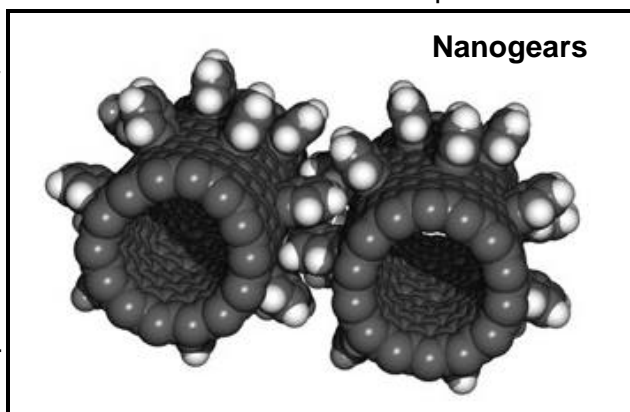
Sponsored by RRVs.

Meal/Reservations

There will be meat, vegetarian selections for meal choices. Please reserve your space and/or dinner selection by **calling Ginger at 815-394-5696 or sending an email (ginger.spinasanta@hs.utc.com) by Monday, Jan 27, at noon.** Please include your name, phone number, email address, IEEE member number and meal selection. The cost of the dinner is **\$5 for members, \$10 for non-members, and \$2 for students.**

Note

The meeting is open to the general public. You need not be an IEEE member. Guests are welcome. However, please call to enable us to make appropriate arrangements.



colleagues at the Richardson Sensor Fab more than 25 sensor products and was an active production engineer overseeing the wafer level C4 process, platinum deposition and the UltraTech 1x Steppers. Dr. Haji-Sheikh has three issued patents to his name

November Meeting Recap

By Mohammed Irfan

U of I's Dr. Philip Krein presented a talk on the **Nature and Promise of 42 V Automotive Power** at Northern Illinois University's Engineering building as part of an annual joint RRVS and student branch meeting. Dr. Krein is the director of the Grainger center for Electric Machinery and Electro mechanics in the Department of Electrical and Computer Engineering at the University of Illinois. RRVS section leadership attended the talk.

The seminar began with need for 42V in automobile electrification like combined starter-braking, and active suspension steering thereby increasing and reducing the cost. hence high voltage is renumber of car motors. issues and regulation level regulated (48V) and battery regulated system (36V), 42V is the best tradeoff of safety and most efficient technology to operate in an open electrical system. Different loads require different voltage levels, for example lamps and sensors are more rugged and reliable at 12V; motors, pumps and fans require 42V and much higher voltage is needed for electric traction power. Possible architectures are – Single Battery at 42 V, Dual Battery, 12V Battery and Distributed converters with 42V battery. Ultimately a true multiplexed system is expected to be achieved with a single 42V power bus delivered throughout the vehicle and a network protocol overlaid on it. Local dc-dc converters provide complete local operation and protection. For better reliability ring bus or redundant bus topology can be used. Partial multiplexed systems that distribute power to networks rather than individual loads may also be considered.



the advantages and titive electrical systems. enables more features alternator, regenerative pensions and improved creasing fuel efficiency More electric power and quired for increased Considering the safety requirements for fully regulated (48V) and battery regulated system (36V), 42V is the best tradeoff of safety and most efficient technology to operate in an open electrical system. Different loads require different voltage levels, for example lamps and sensors are more rugged and reliable at 12V; motors, pumps and fans require 42V and much higher voltage is needed for electric traction power. Possible architectures are – Single Battery at 42 V, Dual Battery, 12V Battery and Distributed converters with 42V battery. Ultimately a true multiplexed system is expected to be achieved with a single 42V power bus delivered throughout the vehicle and a network protocol overlaid on it. Local dc-dc converters provide complete local operation and protection. For better reliability ring bus or redundant bus topology can be used. Partial multiplexed systems that distribute power to networks rather than individual loads may also be considered.

The 42V automotive power increases reliability, flexibility and control with major applications in electric power steering, electric air conditioning, integrated starter-alternator, water pump, electromechanical valves, engine cooling fan and active suspension. There are fuel economy improvements just at this level, but the extension to "mild hybrids" offer much more with small motors used to manage performance. Minimum traction power for mild hybrid is 5KW, which can be accessed using 42V system although higher voltages would be beneficial.

A hearty thanks go to the speaker and to Yen Cheng in DeKalb for an excellent event.

February Meeting Preview

We are trying to line up a NASA engineer to speak during Engineering week at our annual joint ASME/IEEE February meeting.

All Electronic Delivery of the RRVS Newsletter

The RRVS Newsletter is now available online. Members who would like to have a copy emailed to them, please send an email request to b.parro@ieee.org. Email notification of availability of the newsletter at the section website (see page 1, upper right corner) will be sent to all members with whom we have a valid email address on file. Please check for your valid email address.

Chicago/Rockford IEEE Consultants' Network Meeting

The Chicago/Rockford IEEE Consultants' Network will be meeting on **Tuesday**, January 21, 2003, 7:30 - 9:00 PM at the Palatine Public Library, 700 North Court, Palatine, IL 847-358-1216. At 6:15 PM, we meet for an optional dinner at Bakers Square . It is located at 270 E. Northwest Highway and North Court, just south of the library.

In addition to networking and sharing leads and referrals, on January 21, we plan to have an open discussion on "Considerations in Setting Consulting Fees". Members will share ideas and methods they have used successfully for setting client fees. We will investigate the various direct and support task aspects as well as the issues of reasonableness and competitiveness in developing a fee structure.

Non-members are welcome to either activity. Information about the network can be obtained by e-mail: g.l.blank@ieee.org or visit our web site at <http://www.drblank.com/coaction.htm>

Submissions to *Event Sense*

Send articles and job ads to the *Event Sense* editor, Bob Parro, via e-mail (preferred), or fax. Job ads will run for two consecutive months. Contact the *Event Sense* editor if the ad needs to run longer. Please make submissions by the twenty-fifth of the month. All submissions are subject to editing for style, clarity, and space considerations.

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*Messages for student officers can be left at the NIU Dept of
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Rock River Valley Section
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Calendar

January Section Meeting January 30
The Role of Engineering in Nanotechnology at Rock Valley College



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