



**in this scanner**

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Early Scanner covers, clockwise from upper right: December 1994/January 1995, July/August 1986, September 1986, September 1984, May/June 2000, December 1992/January 1993, and the first Scanner issue, September 1983. Photo credit: Food and Drink Photos / Universal Images Group

## STEM Inspires Montgomery Youth

Montgomery College Hosts Science and Engineering Experiences

On Thursday, April 18th, 2013, 15 middle school students from Roberto Clemente Middle school, along with their principal, Dr. Khadija Barkley, visited Montgomery College Engineering Department's state-of-art machine shop in Rockville, and under the supervision of shop manager, Bill Schuster and engineering professors, Dr. Uche Abanulo (IEEE Student Branch Faculty Advisor) and David Bern, built their own forklifts using high-end tools and equipment. Montgomery College engineering students served as teaching assistants and facilitators for to youth as they worked on their projects.

This field trip was organized as part of M.E.A.T (Montgomery College Engineering Ambassadors and Teachers) a partnership between Montgomery College and STEM Academy (after-school program Excel Beyond the Bell's STEM provider) through which Montgomery College engineering students served as paid and volunteer mentors and teaching assistants to middle school students, teaching them engineering through hands-on projects such as robotics, electronic circuits (building radios, lie detectors and other devices) and radio communications. By participating in this program, students gained an opportunity to enhance their engineering knowledge and skills while working on exciting projects with friends and peers. They also learned to be leaders and to provide service to the community. All participants – middle school and college students alike – acquired professional engineering education experience.

See STEM, p. 6



Top: Clemente Student, Josh Yu, and Montgomery College student, Min Thura, using a vertical drill press. Bottom: Professor Uche Abanulo and the radio team show their new FCC licenses in a summer STEM camp at Montgomery College. Photo credits: Dr. Uche Abanulo and Dr. Lan Xiang

*“Intellectual and social salsa.”*

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# calendar of events

For the latest calendar information, go to [www.ieee.org/escanner](http://www.ieee.org/escanner).

## SECTION ADMINISTRATIVE MEETINGS

*Mondays: Oct 14 / Nov 11, 2013*

### Baltimore Section Executive Committee Meetings

**Time:** 6:00 p.m. dinner, 6:30 p.m. meeting  
**Place:** Conference Room, National Electronics Museum, 1745 W. Nursery Rd, Linthicum, MD (410) 785-0230  
**Website:** <http://www.ieee.org/baltimore>  
**More Info:** For the most current information, check the Section website.

*Tuesdays: Oct 1 / Nov 5, 2013*

### Washington Section Administrative Committee Meetings

**Time:** 6:30 p.m.  
**Place:** American Association for the Advancement of Science (AAAS), 2nd Floor Conference Room, 1200 New York Avenue NW, Washington, DC.  
**Directions:** Use the 12th Street entrance. The AAAS building is one block from Metro Center (Red, Orange and Blue lines). Parking is available in the garage on 12th Street directly across from the AAAS building.  
**More Info:** All interested IEEE members welcome.  
**Contact:** Carolyn Carroll at [carrollca@yahoo.com](mailto:carrollca@yahoo.com) by the day prior to the meeting with agenda items and RSVP.

*Wednesdays: Oct 9 / Nov 13, 2013*

### NoVA Section Administrative Committee Meetings

**Time:** 6:30 p.m.  
**Place:** Olive Garden (Tyson's Corner), 8133 Leesburg Pike Vienna, VA 22182  
**More Info:** All interested IEEE members welcome.  
**Contact:** Please RSVP to the Section Secretary at [nova.secretary@yahoo.com](mailto:nova.secretary@yahoo.com) by Noon of the day prior to the meeting.

## COMMUNITY INTEREST

*Friday October 25, 2013*

### Maryland Robotics Day

**Place:** University of Maryland at College Park  
**Sponsor:** Maryland Robotics Center  
**Cost:** Free (registration required)  
**Registration:** <http://ter.ps/robotday>  
**More Info:** Two tracks are offered: The morning track (10am-noon) for students and school groups includes lab tours, robot demonstrations, and information about studying engineering at UMD. The afternoon track (1-4pm), for industry and government professionals, features a keynote address by University of Michigan roboticist Jessie Grizzle, followed by open lab tours.

## CONFERENCES

*October 21-23, 2013 (Mon - Wed)*

### Carbon Management Technology Conference

**Place:** Alexandria Hilton, 1767 King Street, Alexandria, VA 22314  
**Sponsor:** IEEE-USA with seven other technical organizations  
**Website:** <http://fscarbonmanagement.org/>  
**More Info:** Co-located workshops on Oct. 20 and 24 available to conference attendees at no extra cost.

*October 23-25, 2013 (Wed - Fri)*

### Applied Imagery Pattern Recognition Workshop (AIPR 2013)

**Place:** Cosmos Club, 2121 Massachusetts Ave, NW, Washington, DC, Powell Auditorium  
**Sponsors:** IEEE Computer Society  
**Cost:** IEEE/CS members: \$450 early; \$530 after October 1. IEEE Students/Life: \$225/\$275  
**Website:** <http://www.aipr-workshop.org/>  
**More Info:** Additional tickets to Wednesday evening banquet available for \$80.

*November 3-6, 2013 (Sun - Wed)*

### Sensors Conference

**Place:** Renaissance Baltimore Harborplace Hotel, 202 E. Pratt Street, Baltimore, MD 21202  
**Sponsor:** IEEE Sensors Council  
**Website:** <http://ieee-sensors2013.org/>  
**More Info:** Three tutorial tracks are available on Nov. 3.

*November 7-9, 2013 (Thu - Sat)*

### International Conference on Wireless for Space and Extreme Environments (WiSEE)

**Place:** Renaissance Baltimore Harborplace Hotel, 202 E. Pratt Street, Baltimore, MD 21202  
**Sponsors:** IEEE-USA, IEEE-Canada, IEEE Baltimore Section, UFFC, APS, COMSOC, CRFID, URSI, The Institute for Systems Research at the University of Maryland, and others  
**Website:** <http://sites.ieee.org/wisee/>

## WORKSHOPS & TRAINING

*Saturday September 28, 2013*

### IEEE Region 2 South Area Sections Fall Leadership Meeting

**Sponsor:** IEEE Washington, Northern Virginia, and Baltimore Sections  
**Time:** TBA  
**Place:** National Electronics Museum, 1745 W. Nursery Road, Linthicum, MD 21090  
**Map:** <http://www.nca-scanner.org/r2/nem.html>  
**Contact:** Carole C. Carey at [c.carey@ieee.org](mailto:c.carey@ieee.org)  
**More Info:** Co-located with joint administrative meeting. Please contact your Section Chair if you would like to attend or provide input.

*Wednesdays: Oct 2 - Nov 20, 2013  
 or  
 Saturdays: Oct 19 - Nov 23, 2013*

### Certified Software Quality Engineer Refresher Course

**Sponsor:** IEEE CS /ASQ 509 Educational Program  
**Instructor:** Ray Miller  
**Cost:** \$395 for the series  
**Contact:** Kevin King at [Education@asq509.org](mailto:Education@asq509.org) or Ray Miller at 202-714-9700 or [awppmt@yahoo.com](mailto:awppmt@yahoo.com)  
**More Info:** Course does **not** include registration for the CSQE exam. See detailed information on the website. Order course materials from Quality Council of Indiana and bring them to the first class. Photo ID required for admission.

*Choose One:*

**Time:** Wednesdays 6:00 pm - 9:00pm (8 sessions)  
**Place:** WMATA, 600 5th St, NW, Room 505, Washington, DC 20001

**Registration:** <http://csqefall2013refresherwmata.eventzilla.net>

*Or:*

**Time:** Saturdays 8:00am - 12:00 noon (6 sessions)  
**Place:** Montgomery College 51 Mannakee St, Rockville, MD 20850 (Room TBA)

**Registration:** <http://asq509csqerefreshfall2013.eventzilla.net>

*Saturdays: Oct 12 - Nov 23, 2013*

### Certified Software Quality Auditor Refresher Course

**Sponsor:** IEEE CS /ASQ 509 Educational Program  
**Instructor:** Sandra L. Menzies  
**Time:** 800 AM - 12:00 noon  
**Place:** TBA in Rockville/Gaithersburg area  
**Cost:** \$395 for six-week series plus required materials (ordered directly from <http://www.qualitycouncil.com>)  
**Registration:** <http://cqafall2013refresher.eventzilla.net>  
**Contact:** Kevin King at [Education@asq509.org](mailto:Education@asq509.org) or Sandra Menzies at 301-385-9294 or [smenzies@yahoo.com](mailto:smenzies@yahoo.com)  
**More Info:** Course does **not** include registration for the ASQ CQA exam. See detailed information on the website. Order course materials from Quality Council of Indiana and bring them to the first class.

*Saturday October 26, 2013*

### Flexibility in Engineering Design

**Sponsor:** International Council on Systems Engineering, Chesapeake Chapter  
**Instructor:** Richard de Neufville, MIT  
**Time:** breakfast 8:30am, course 9:00am - 5:00pm  
**Cost:** \$199 includes breakfast, lunch, and book  
**Place:** Johns Hopkins Applied Physics Laboratory, 11100 Johns Hopkins Rd Laurel MD 20723 (Main Entrance - Lobby 1)  
**Contact:** Dr. Alex Pavlak at [Alex.Pavlak@INCOSE.org](mailto:Alex.Pavlak@INCOSE.org)  
**More Info:** See website at <http://www.incose-cc.org> and **Diamond Story**, p. 8 for details.

See more **Calendar of Events**, p. 5

# 2014 Elections

## IEEE President-Elect 2014

## IEEE President 2015

If you have not yet voted in the IEEE Annual Election, as the Scanner goes to press, it is not too late. The candidate profiles presented here were provided by IEEE for broad distribution and are featured in alphabetical order. The deadline to submit a ballot is 12:00 noon (CST) on October 1, 2013. Ballots were mailed to all voting members as of June 30, 2013 and can be accessed electronically by entering IEEE account credentials (top right corner of browser page) at <http://www.ieee.org/election/>.



**TARIQ S. DURRANI**  
(Nominated by IEEE Board of Directors)  
Research Professor  
Department of Electronic and Electrical Engineering  
University of Strathclyde  
Glasgow, United Kingdom  
[www.TariqDurrani.org](http://www.TariqDurrani.org)

Tariq Durrani joined Strathclyde as Lecturer (1976); appointed Professor (1982); Department Head (of one of the largest in UK) (1990-1994); and Deputy Principal (2000-2006) responsible for university-wide large-scale strategic developments. His research covers Communications, Signal Processing, Technology Management. He has authored 350 publications; conducted collaborative research with industry, partnered in major European research programs; supervised 40 PhDs. Currently holds visiting appointments at Princeton, University of Southern California, Stirling and UESTC Chengdu.

Tariq has held Directorships in eight organizations including UK National Commission for UNESCO; served as consultant advisor to the Governments of UK, Netherlands, Portugal, UAE, US and European Union.

He is Fellow: IEEE, UK Royal Academy of Engineering, Royal Society of Edinburgh, and IET. Currently Vice President (International) Royal Society of Edinburgh (2012-2013).

In 2003 Queen Elizabeth honored him with the title OBE (Officer of the Order of the British Empire) 'for services to electronics research and higher education'.

### IEEE Accomplishments and Activities (M'82-M'86-SM'87-F'89)

Tariq has served on major IEEE Boards including Technical Activities, Educational Activities, Awards and Publication Services and Products; Conferences Committee, and led key Technical Societies, **delivering achievements with long term impact:**

**President IEEE Signal Processing Society (1994-1995).** Established the IEEE Jack Kilby Medal (1995). Created the highly successful *IEEE Signal Processing Letters*.

**President IEEE Engineering Management Society (2006-2007).** Fostered technology management activities, extended support and services to members across IEEE technical societies.

**Regional Director IEEE Communications Society for Europe, Middle East and Africa (EMEA) (2009-2011).** Established IEEE ComSoc EMEA Young Researcher Award, recognizing talented young members.

**Vice Chair IEEE Publication Services and Products Board and Chair TAB Periodicals Council (1996-1997).** Established Periodicals Review Committee for improving quality and timeliness of IEEE Transactions.

**Vice Chair Region 8 Technical Activities (2003-2004).** Promoted industry liaison, Section reviews, chaired R8 Conferences Committee.

**Member IEEE Awards Board (2006-2008).** In partnership with the Royal Society of Edinburgh, established joint IEEE/RSE Maxwell Medal.

**Vice President IEEE Educational Activities Board (2010-2011).** Delivered vision and strategic plan enhancing global engagement. Promoted key programs that support educational needs worldwide at pre-university, university, and professional levels. Promoted the multilingual IEEE flagship portal *TryEngineering.org* for pre-university students, parents, and school counsellors.

**Promoted Teacher-in-Service Program (TISP).** Reaching over 580,000 students annually through teachers trained in engineering design principles.

**Fostered global accreditation to improve engineering education quality in South America, the Caribbean, India, China and Middle East.** Supported IEEE E-learning Library for continuing education of practicing engineers.

**Popularized EPICS (Engineering Projects in Community Service) - now in 24 countries - extending global reach of the IEEE.**

**IEEE Conferences.** General Chair IEEE Signal Processing Society flagship Conference ICASSP '89 (1600 attendees); Executive Chair IEEE Communications Society keynote Conference ICC-2007 (1500 delegates); General Chair International Engineering Management Conference IEMC-2002 (280 participants).

**Member IEEE Conference Committee (2008-2009).**

### Statement

I shall work ceaselessly to maintain and enhance IEEE as the world's premier organization of professionals. I undertake to:

See Durrani, p. 9



**HOWARD E. MICHEL**  
(Nominated by IEEE Board of Directors)  
Consultant, HEM Consulting  
Dartmouth, Massachusetts, USA;  
and Associate Professor  
University of Massachusetts  
Dartmouth, Massachusetts, USA  
[www.HowardMichel.net](http://www.HowardMichel.net)

Howard retired from the U.S. Air Force in 1994, having been a pilot, satellite launch director, and engineer, including in the People's Republic of China where he served as a senior U.S. Government technical representative enforcing technology-transfer control plans and procedures during two satellite launches. Other achievements include successfully launching seven U.S. satellites by directing launch-base test and integration involving booster, satellite, and telemetry-range hardware; and developing U.S. Department of Defense engineering processes for mission-critical computer systems.

Howard is a consultant for the U.S. DoD and private industry in the area of embedded systems, avionics, instrumentation and systems engineering.

Howard is Associate Professor of Electrical and Computer Engineering at UMass-Dartmouth. He has secured research funding from U.S. NSF and NOAA. He holds two patents and has published a textbook, 15 refereed journal papers and 70 conference papers, posters or abstracts. He has graduated 3 PhD and 35 MS students.

### IEEE Accomplishments and Activities (S'73-M'77-SM'02)

Recent leadership roles in the IEEE:

- IEEE Board of Directors (2008-2009, 2011-2012)
- IEEE Vice-President, Member and Geographic Activities (2011-2012)
- Member and Geographic Activities Board (2008-2013)
- IEEE-USA Board of Directors (2008-2009)
- Technical Activities Board (2010)
- Region 1 (Northeast US) Director (2008-2009)

Major committees:

- Chaired the IEEE Public Visibility Committee (2009-2010)
- Co-chaired (with VP-Technical Activities) an ad hoc committee to incorporate a basic society membership into IEEE membership (2011-2012)
- Member TA/PSP Products and Services Committee (2010)
- Member ad hoc Corporate Engagement Committee (2012)
- Member Governance Committee (2008-2009)
- Member Strategic Planning Committee (2009)

### As Vice President, Member and Geographic Activities

Created and implemented "Metro Area Smart-Tech Workshops" — partnerships between local volunteers, IEEE Societies and professional staff

- Workshops effectively engaged practicing engineers and computer scientists to support their technical and professional needs
- Workshops universally received outstanding reviews (80%-90% satisfaction, 40%+ top box ratings) from attendees.
- I continue to work to expand these into all areas of the world

Led a global network of volunteers

- Dealt with international legal compliance and financial issues impacting Sections, volunteers and members around the world
- Managed the development and implementation of an approval process for conferences — personally worked with senior local volunteers in China to implement it

- Piloted processes to empower and reward local geographic units for engaging members

As **Region 1 Director**, instituted a formal program to work with industry

- Envisioned and created several "industry days" attended by hundreds of members and senior industry managers
- Afforded direct contact between our members and industry leaders
- Continued and expanded this globally as VP-MGA

As **Chair, IEEE Public Visibility Committee (PVC)**

- Created the IEEE tag line *Advancing Technology for Humanity*
- Established PVC as a standing committee of the IEEE Board
- Led PV efforts in ten countries, targeting four demographics, on six hot topics—highlighted the brand globally

More at [www.HowardMichel.net](http://www.HowardMichel.net).

### Statement

I will work passionately on four things if elected IEEE President:

**Provide tools for career security for all members worldwide**

See Michel, p. 9

# chapter calendar of events

For the latest calendar information, go to [www.ieee.org/escanner](http://www.ieee.org/escanner).

## CHAPTER EVENTS

### Thursday September 26, 2013

#### NANOTECHNOLOGY – What it is, where to find it, and why you should care\*

**Sponsor:** Montgomery College IEEE Student Branch, IEEE Nanotechnology Council  
**Time:** 6:00pm - 8:00pm  
**Place:** Montgomery College 51 Mannakee Street Rockville, MD Room TC-136  
**Speakers:** Mr. Robert Ehrmann and Dr. Osama Awadelkarim, Penn State CNEU)  
**Registration:** [https://meetings.vtools.ieee.org/meeting\\_view/list\\_meeting/20357](https://meetings.vtools.ieee.org/meeting_view/list_meeting/20357)  
**Contact:** Monica Mallini at [m.a.mallini@ieee.org](mailto:m.a.mallini@ieee.org)  
**Directions:** [www.montgomerycollege.edu/maps](http://www.montgomerycollege.edu/maps)  
**More Info:** See Diamond Story, p. 12.

### Tuesday, October 8, 2013

#### Delhi Metro Rail Corp. (DMRC) 25kV Electrification

**Sponsor:** VTS Chapter with ASME Rail Transportation Division  
**Time:** 11:30am - lunch and speaker  
**Place:** American Public Transportation Association 11th Floor Conference Room 1666 K Street, NW, Washington, DC  
**Speaker:** Paul E. Jamieson, PE, Principal Consultant, Interfleet Technology  
**Cost:** \$15.00 cash at the door (subsidized by IEEE VTS Chapter)  
**Directions:** Red Line: Farragut North (K Street Exit) or Orange/Blue Lines: Farragut West (17th Street Exit)  
**Registration:** Please register by NOON on Friday Oct. 4 by email to [vts.ltc.dc@gmail.com](mailto:vts.ltc.dc@gmail.com) and indicate regular or vegetarian meal.  
**More Info:** See Diamond story, p. 8.

### Tuesday October 8, 2013

#### Security Challenges with LTE-Advanced Systems and Military Spectrum

**Sponsor:** Communications Society Baltimore Chapter  
**Time:** 5:30pm - refreshments, 6:00pm - talk  
**Place:** National Electronics Museum, 1745 W. Nursery Rd, Linthicum, MD (410) 785-0230  
**Speaker:** Charles Clancey, Virginia Tech  
**Directions:** <http://www.nationalelectronicmuseum.org>  
**Contact:** Curtis Menyuk, Chapter Chair, at [menyuk@umbc.edu](mailto:menyuk@umbc.edu).

### Wednesday October 9, 2013

#### IEEE Computer Society and DCSPIN

**Sponsor:** Computer Society, DCSPIN  
**Time:** 7:00pm (light refreshments and networking), 7:30pm speaker  
**Place:** CACI, 4114 Legato Road, Fairfax, VA  
**Registration:** [dcspringroup@yahoo.com](mailto:dcspringroup@yahoo.com).  
**More Info:** Photo identification required for admission.

### Thursday October 10, 2013

#### Strategy Development and Implementation: Two Case Studies

**Sponsor:** Computer Society, ASQ Performance Excellence SIG  
**Time:** 6:00pm - 8:00pm  
**Place:** METRO Headquarters, 600 5th St, NW Room 505 Washington, DC 20001  
**Registration:** [dcspringroup@yahoo.com](mailto:dcspringroup@yahoo.com).  
**Contact:** Michael Smith at [msmith1@wmata.com](mailto:msmith1@wmata.com)  
**More Info:** See Diamond Story, p. 8.

### Wednesday October 16, 2013

#### Cyber and Physical Threats to the Electric Power Grid

**Sponsor:** International Council on System Engineering (INCOSE), Chesapeake Chapter  
**Co-Sponsor:** IEEE Baltimore Power & Energy Society Chapter  
**Time:** 6pm dinner, 7pm lecture (in Parsons Auditorium)  
**Place:** Johns Hopkins Applied Physics Laboratory, 11100 Johns Hopkins Rd Laurel MD 20723 (Main Entrance – Lobby 1)  
**Cost:** Lecture is FREE; dinner \$25 (or \$20 for INCOSE or IEEE-PES members if payment is received by October 11)  
**Speaker:** Steve McElwee, PJM  
**Registration:** <http://www.incose-cc.org/registration/>  
**Website:** <http://www.incose-cc.org>  
**Contact:** Dr. Alex Pavlak at [Alex.Pavlak@INCOSE.org](mailto:Alex.Pavlak@INCOSE.org)  
**More Info:** Entertainment provided by the APL Jazz Group in the Parsons Auditorium for those arriving before 7pm. See website flyer for more information, map, directions, menu, dinner location, and door prize description. Also see Diamond Story, p. 8.

### Thursday October 17, 2013

#### Mobile Security

**Sponsor:** Computer Society, ISSA  
**Time:** 5:30pm (Dinner and Networking), 6:15 - 8:00pm (Program)  
**Place:** Oracle, 1900 Oracle Way, Reston, VA 20190  
**Speaker:** Mr. Eugene Liderman, Good Technology  
**Contact:** Alex Grohmann at [President@issa-nova.org](mailto:President@issa-nova.org) or John Dyson at [VP\\_Programs@issa-nova.org](mailto:VP_Programs@issa-nova.org)  
**Registration:** <http://nova.issa.org/?p=1232>.

### Wednesday October 23, 2013

#### Company Profile: Integrity Applications, Inc.

**Sponsor:** Employment Network, Signal Processing Society, NCA Consultants Network  
**Time:** 7:00pm to 8:30 p.m.  
**Place:** DeVry University, 2450 Crystal Drive Room 353 Arlington, VA 22202  
**Speaker:** Mr. Joseph Brickey  
**Contact:** Richard Swerdlow at [swerdlow@erols.com](mailto:swerdlow@erols.com)  
**More Info:** See Diamond Story, p. 8.

### Wednesday October 23, 2013

#### Sharing Life Experiences

**Sponsor:** Life Members Group  
**Time:** 12 noon to 1:30 p.m.  
**Place:** Tysons-Pimmit Regional Library, 7584 Leesburg Pike, Falls Church, VA 22043  
**Contact:** Amarjeet Basra at [amarjeet.basra@ieee.org](mailto:amarjeet.basra@ieee.org).

### Monday October 28, 2013

#### Fall Fiesta

**Sponsors:** Technology Management Council, Sensors Council, NCA Consultants Network, Baltimore and Washington GOLD  
**Time:** 6:00 pm - 8:00 pm  
**Place:** Montgomery College 20200 Observation Drive Germantown, MD Room HT-216  
**Contact:** Monica Mallini at [m.a.mallini@ieee.org](mailto:m.a.mallini@ieee.org)  
**Registration:** [https://meetings.vtools.ieee.org/meeting\\_view/list\\_meeting/20843](https://meetings.vtools.ieee.org/meeting_view/list_meeting/20843)  
**More Info:** See Diamond Story, p. 8.

### Tuesday October 29, 2013

#### Development of a Configuration Standard

**Sponsor:** IEEE CS /ASQ 509 Educational Program  
**Sponsor:** Computer Society, ASQ 509 Software SIG, SSQ  
**Time:** 6:30pm - 8:30pm  
**Place:** (Primary) MITRE-2 room 1N100, 7525 Colshire Drive, McLean, VA 22102, (Alternate) FDA, Bld 66, room G512, 10903 New Hampshire Avenue, Silver Spring, MD  
**Contact:** Scott Ankrum at [ankrums@mitre.org](mailto:ankrums@mitre.org)  
**Registration:** <http://www.asq509.org/ht/d/DoSurvey/i/26913> (After October 1)

### Wednesday October 30, 2013

### Wednesday November 27, 2013

#### IEEE-CS and ASQ 509 Lean Six Sigma SIG

**Sponsor:** Computer Society, ASQ LSS SIG  
**Speaker:** Gregg Monaco (Oct.30); TBA (Nov. 27)  
**Time:** 6:00 pm (networking) 6:30pm (program)  
**Place:** TEQCORNER 1616 Anderson Rd McLean, VA (3rd floor Center Conference Rm)  
**Contact:** Ron Kelley, SixSigmaSIG@asq509.org  
**Registration:** <http://www.asq509.org/ht/d/DoSurvey/i/38891>.

### Tuesday November 12, 2013

#### Communications Society Seminar Series

**Sponsor:** Communications Society Baltimore Chapter  
**Time:** 5:30pm - refreshments, 6:00pm - presentation  
**Place:** National Electronics Museum, 1745 W. Nursery Rd, Linthicum, MD (410) 785-0230  
**Speaker:** Michael Loushine, Applied Communications Sciences  
**Directions:** <http://www.nationalelectronicmuseum.org>  
**Contact:** Curtis Menyuk, Chapter Chair, at [menyuk@umbc.edu](mailto:menyuk@umbc.edu).

Engineering Student Ambassadors Teach in Middle Schools Through Unique Partnership

# STEM Academy Enriches Youth Programs

*The Montgomery College IEEE Student Branch participated in a middle school outreach program in Montgomery County. We visited Roberto Clemente, Forest Oak, and Neelsville middle schools to teach students about STEM through hands-on workshops.*

— Michael Varghese, 2012 IEEE Student Branch President

In 2011, EXCEL Beyond the Bell (EBB), an afterschool program to enrich the lives of low income middle school students in Montgomery County, was launched in three middle schools: Roberto Clemente, Argyle, and Loiderman middle schools.

To provide STEM activities for EBB participants, STEM Academy was funded by the Montgomery County Collaboration Council for Children Youth and Families for Roberto Clemente Middle School in 2011-2012. STEM Academy also partnered with the Montgomery College (MC) engineering department to form the MEAT (MC Engineering Ambassadors and Teachers Program), which allows MC students to serve as mentors and teachers for these middle school youth.

Some of the programs run by the partnership are:

**Electronics Lab:** Youth will learn about the exciting world of radio communications and electronics while working with electronic circuit components and integrated circuit such as diodes,

several motivating robot programming competitions which will keep students alert, team-spirited and professional.

The program usually include field trips to NIST and Howard University Nanotechnology Lab, in addition to the trip to the Montgomery College - Rockville Engineering Shop. (See related story on page 1.)

The program boasts several outstanding achievements:

- Four EBB youth (along with 2 instructors) took and passed the Amateur Radio Technician's License Exam. They now have federal licenses to operate two-way radios and communicate around the world. This license is mostly held by adults and requires comprehensive knowledge of electrical engineering and radio communications technology and rules.

- STEM Academy partnered with Montgomery College to host the first annual STEM Activity Conference on May 25, 2013 to showcase and celebrate projects from Excel Beyond the Bell.

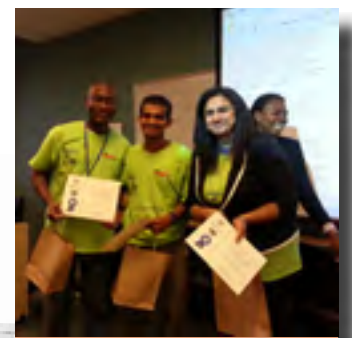
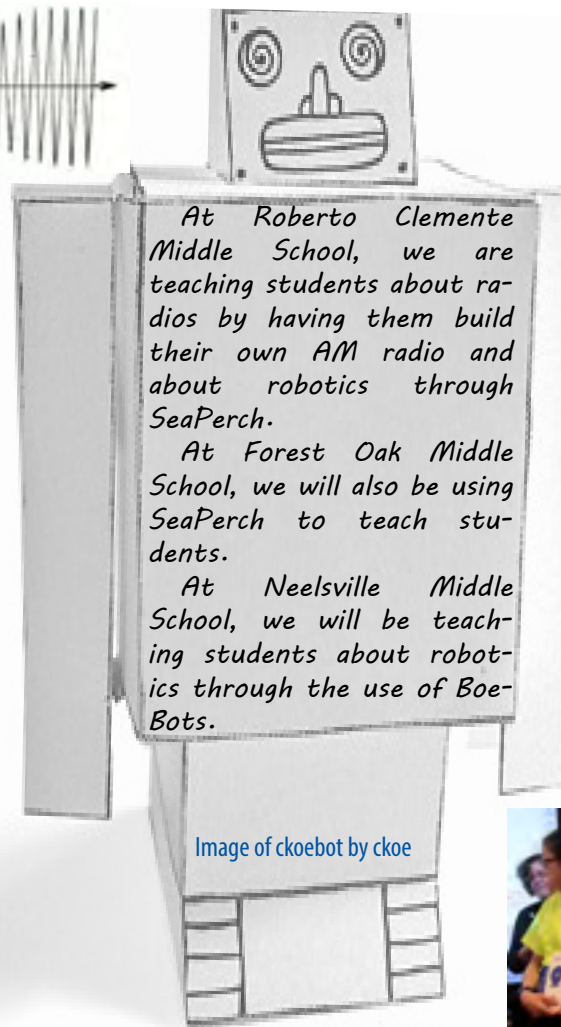


transistors, operational amplifiers and timer circuits. Participants also gain fundamental circuitary skills such as soldering, resistance and capacitance identification, and element connection as they build technology devices such as AM and FM Radios, lie detector machines and Morse code transmitters.

**Robotics:** Youth will explore the state-of-the-art field of autonomous robotics as they work in teams to build, program, and redesign autonomous robots. They are introduced to electrical circuit theory, electrical components, programmable microcontroller interfacing, servo motors, photoresistors, infrared sensors, and transmitters. This class also features

This was an opportunity for youth and their families to learn more about STEM while observing projects and competitions among middle school, high school and college students. There were lots of activities including a guest lecture about STEM, a tour of the Engineering Department, and different STEM competitions among middle school, high school and college students. Over 100 participants, family members, and supporters attended this event.

You can find more information in this video: [https://docs.google.com/file/d/0B2J96R2OsnzBdTIEQVJMM1EzS00/edit?usp=drive\\_web](https://docs.google.com/file/d/0B2J96R2OsnzBdTIEQVJMM1EzS00/edit?usp=drive_web).



Montgomery College Engineering Student Ambassadors

A total of 13 MC students have worked in the program, mentoring students with projects including underwater robots, computer-aided design, electronics, and nanotechnology. The groups have toured NIST, the Naval Surface Warfare Center, and the Nanotechnology Research Center at Howard University.



The pilot project was so successful that this year, the program is funded in six middle schools: Roberto Clemente, Argyle, Loiderman, Neelsville, Forest Oak, and E. Brooke Lee Middle Schools in Montgomery County.

The current MC ambassadors include: Mujtaba Elhag, Daniel Alberquerque (2013 IEEE Student Branch President), Armand Nokbak, and Peng Wang.

Past MC Ambassadors include some students who have moved on to engineering studies at leading universities: Michael Varghese (Georgia Tech), Wisdom Ebirim (Virginia Tech), Taqiyya Safi (UMCP), Ryan Smith, Brian Lahore, and Adatchende Hounzangli.

The STEM program is directed by Uche Abanulo, PhD (MC Engineering faculty) and Jude Abanulo, PhD (Howard University Chemistry faculty) with assistance from MC faculty volunteer David Bern.

A parent reports her son's EBB experience:

"The Excel Beyond Bell has great STEM activities for middle school students. Kevin was a 6th grader in Roberto Clemente MS in which he attended the Excel Beyond Bell STEM ham radio program. Not only did he enjoy all the activities; he is greatly inspired and motivated about learning and exploring science and engineering. He worked very hard at the end of the program and earned his radio Technician Class license from the FCC in June. In the summer he has participated in several community services with radio communications." - Lan Xiang

A video of the MC field trip is available at <http://www.youtube.com/watch?v=oSpU6-bxN-I>.

Dr. Uche Abanulo, Dr. Lan Xiang, and Michael Varghese contributed to this article.



## Polishing Your Professional Image: Seven Rules for Job Seekers

By Dr. Laura Hills,  
President, Blue Pencil Institute, LLC



**D**ress, accessories, and grooming are hugely important factors in the job seeker's professional image. But what, exactly, is professional when it comes to one's image, and how, specifically, can one convey professionalism to others? This article offers seven specific strategies the job seeker can use to polish his or her professional image. It suggests that it is vital to understand what appearance says to others about you. This article also offers guidance for being professional yet expressing one's individuality. Finally, this article reveals the classic signs when lack of professional attire is hurting your career.

The success of any face-to-face encounter when job hunting begins the moment anyone lays eyes on you, and often before either of you speaks. Many people believe that they should be judged by who they are, not by what they wear or how they style their hair. In an ideal world, perhaps that would be true. However, the reality is that most of us do judge others according to what we see. In fact, most people will form impressions about others within 10 seconds of meeting them, impressions that are extremely difficult to change.

Try going to a busy restaurant at lunchtime. Look around you and notice what the other patrons are wearing. Pay attention to their clothing, makeup, hairstyles, shoes, purses, jewelry, ties, cufflinks, briefcase, and other accessories. See if you don't make

judgments about who each person is and his or her line of business, personality, competencies, and level of success. So it is, too, for the people who meet you on a job interview or at a networking event. They will form judgments based almost entirely on your physical appearance and the choices you make about how you present yourself.

It is important to understand how to dress and groom for the work you do and in the environment in which you'd like to work. The right image can help others relate better to you, project an image of professionalism, and improve your self-image, self-esteem, and performance. The question is – what is a professional image? What are the components of that image? And, how can a job seeker practically achieve it?

Below are seven rules for professional dress and grooming for job seekers. Read on to learn in very specific terms precisely how you can polish your professional image and use that image to maximize your work performance, improve your relationships, and ultimately, get that job you want.

### **Rule #1: Know What Your Appearance Says about You**

What you choose to wear and how you choose to wear it sends clear messages to others, whether those messages are intended or not. When considering your work wardrobe, accessories, and grooming, consider how you can best reveal the following characteristics about yourself:

**Self-esteem:** How you dress tells the world what you think about yourself. For example, when you wear ill-fitting, soiled, or torn clothing, it can make others aware of a poor sense of self-worth. The converse is also true; a person who takes care in his or her appearance conveys that he or she has a strong sense of self-worth. What people see on the outside reflects how much you value yourself and lets them know how you feel about yourself on the inside.

**Self-respect:** How you wear clothing and what you choose to wear show others how much you respect yourself. For example, re-

spect for self is generally lacking in women who in the workplace wear skirts that are too short, necklines that are too low, and clothing that is too tight or transparent. Men who wear pants that are too short or that have holes, or who wear ties with spots, also project a lack of self-respect. Self-respect plays a big part in knowing and wearing the acceptable thing socially and professionally.

**Confidence:** The way you carry yourself and dress contributes greatly to the air of confidence others perceive. For example, think about people you may have seen who wear hats. Even if you don't personally like to wear hats or don't like them, you probably think the person who wears a stylish hat exudes confidence. Your goal in polishing your professional image is to create that same aura of confidence and assuredness – but in a professional way – each time you walk into a room. Choose clothing and accessories that contribute to the part.

**Organizational skills:** A polished image demands that we create a unified look from head to toe. Think about how a woman's outfit can be ruined by wearing the wrong shoe, purse, or hosiery. Or, consider how a man looks when he's wearing the wrong tie or shirt. Putting together thoughtful and complete outfits with all of the details right conveys that you are organized and that you pay close attention to all of the details, even the small ones.

**Soundness of judgment:** Wearing the right outfit for the right occasion indicates that you can make good decisions. Likewise, wearing the wrong outfit conveys that you make poor and unfortunate decisions. Knowing whether to wear a traditional suit, a business casual outfit, or formal attire to blend in appropriately at an occasion suggests that you can make the right decisions at work, too.

**Attention to detail:** So much goes into a professional image beyond clothing. Manicured nails, a trimmed mustache and/or beard, lack of 5 o'clock shadow, neat and attractive hairstyle, the right amount and kind of makeup and jewelry – all of these make a huge difference to one's professional image. Paying attention to all of the details and getting them right matters. If you don't believe this, notice when someone gets even one of these details wrong. Usually, our attention goes to the flaw (or flaws) in one's appearance and that flaw overrides the other impressions we have.

*Tip: Think about how distracting it is if someone has something between his or her teeth or has hair out of place. You'll see how it becomes virtually impossible not to notice the flaw and dwell on it.*

**Creativity:** Presenting oneself professionally does not mean that we must have no creativity in our appearance. It is possible to express your uniqueness through a special tie, a scarf, an exquisite piece of jewelry, even the pen you use. While it is true that we must project professionalism first and foremost, we do have some latitude for expressing our creativity and can create a positive impression by doing so.

**Reliability:** Can you be counted on to look and behave in a professional manner wherever your job takes you? Others will assess this quality in you. That's one of the hallmarks of an effective professional image.

## Is Your Attire Hurting Your Career?

**H**ere are some classic signs that your lack of professional attire may be hurting your career:

Someone has told you explicitly that you need to wear more professional attire.

Someone you know feels compelled to remind you to "dress nicely" for special events such as important meetings and presentations.

A colleague with equal or lesser skills but a nicer wardrobe was promoted over you.

On those odd days when you do take a little extra time with your professional attire, your colleagues want to know if you're going on a job interview or if something else is happening to you.

You have asked to be considered for a more visible role but were not offered those opportunities.

Does any of this sound familiar? If so, your attire may be having a negative effect on your career. Whether you like it or not, you may have to have to make some wardrobe changes in order to achieve your career goals.

### **Rule #2: Make Sure It Fits**

A professional image depends upon clothing that fits well and is of the correct length. Celebrities know this; they generally don't wear clothing that hasn't had at least some alterations done to them. That's one of the many trade secrets that makes them look so good.

Few people have "off the hanger" figures. Most of us benefit from at least some help to make our clothing look like it is made for us. Many stores offer tailoring services. If yours doesn't, find a good neighborhood tailor who can alter your clothing to your body. It is well worth the extra money you will have to pay a tailor to alter a new garment so it fits you properly. Don't fool yourself into thinking you can make do with poor-fitting clothing the way it is.

Be especially mindful of fit if you gain or lose weight. Wearing clothes that are too tight or that are swimming on you will hurt your appearance and not reflect well on you. Your clothing should not be pinched or gap when you breathe or walk and you should not have to adjust it constantly.

### **Rule #3: Make Sure It's Clean and Pressed**

Rumpled, wrinkled, stained, and dirty clothing do not exude an image of professionalism. Be sure your clothes are immaculate. A quick press with an iron or a quick going over with a steamer or lint brush can work wonders and will make a huge difference in your appearance. Retire any garment that sports a permanent stain, even if it is otherwise wearable. Even if the imperfection is small, people will notice.

Keep supplies with you to help you handle mishaps that occur during the day.

**See Seven Rules, p. 11**

## Being Professional, but Being You

**W**hen developing a look that is polished, successful, and professional, the focus should be on you, not on what you are wearing. If you've chosen your professional clothing, accessories, and grooming well, you will look great but people will not consciously think a great deal about what you are wearing, at least not the specifics; they will focus more on the overall impression they have of you.

You may be asking yourself at this point whether it is necessary for you to completely abandon your personal style in order to project a professional image. To some extent, it may be necessary to alter what you would like to do in order to conform to others' ideas of professionalism. However, there is still some room for individuality. You must balance your creativity and taste with common sense. For example, for those who feel that they cannot be themselves if they don't wear pink, there may be an opportunity to do so professionally with a soft pink lipstick or a very soft pink nail polish. Shocking pink hair, however, will probably have to go.

The trick in dressing professionally is to think of ways to weave the absolutely essential elements of your own taste into the expectations of professionalism others hold. If you follow the seven rules in this article, you will be able to achieve a professional look that still allows the you inside to emerge. Just remember – dressing and grooming for others is a crucial when job hunting. Others will judge you almost immediately by your image. Do everything you can to make it a professional one.

# diamond ♦ stories

Tuesday, October 8, 2013

## Security Challenges with LTE-Advanced Systems and Military Spectrum

**Abstract:** LTE is universally recognized as the world-wide standard for next-generation mobile broadband services. Operating LTE in military spectrum has recently been proposed for a variety of use cases. Commercial spectrum operators seek to leverage underutilized military bands for commercial service. Given the ability for LTE to operate at high data rates in multipath environments, it could provide the military with more resilient communications in tactical environments. However, these proposed use cases for LTE are non-standard and certain military requirements cannot be immediately supported within the scope of the 3GPP standards. Emerging features within LTE-Advanced provide the initial building blocks for supporting LTE operations in heterogeneous environments that may include hostile interferers. LTE operation in military bands may be possible through the use of distributed spectrum sensing, spectrum allocation databases, carrier aggregation with non-military bands, and real-time radio resource management to cope with interference.

**Biography:** Dr. Charles Clancy is an Associate Professor in the Bradley Department of Electrical and Computer Engineering of Virginia Polytechnic Institute and State University and is Director of the Ted and Karyn Hume Center for National Security and Technology. In this role, Dr. Clancy is responsible for leading Virginia Tech's collaboration with intelligence and defense organizations within federal government and industry. His current research interests include resilient wireless communications and electronic warfare. Prior to joining Virginia Tech, Dr. Clancy was a senior researcher with the Laboratory for Telecommunications Sciences, a federal research lab located at the University of Maryland, where he led programs in wireless communications focused in software-defined and cognitive radio. He received his MS in Electrical Engineering from the University of Illinois, Urbana-Champaign, and his PhD in Computer Science from the University of Maryland, College Park. He is a senior member of IEEE.



Tuesday, October 8, 2013

## Delhi Metro Rail Corp. (DMRC) 25kV Electrification

**Abstract:** In conventional practice, electrical energy is fed to metro railway trains from 750V DC third rail, and a standard gauge of 1435mm is commonly adopted. 25kV 50Hz single phase power supply with Indian Railways Broad Gauge (BG) 5'6" (1676mm) was adopted for the Delhi Metro system 15 years ago. Infrastructure to manufacture track and overhead systems are well developed, facilitating quick adoption and commissioning of the system. An option to connect metro trains to the mainline network was built, enabling passengers from the National Capital Region, extending 100km radially, to transit directly to the city center. The experience with this system has inspired plans for metro services in other Indian cities. Plans are ongoing to connect nearby population hubs by fast links, terminating in the New Delhi capital underground transport network.

**Biography:** Dinesh Bansal, retired Chief Electrical Engineer of Indian Railways, is a graduate in electrical engineering from the Indian Institute of Technology. He is a dedicated attendee at VTS meetings on his annual visit to the US. He has four decades of experience in research, manufacturing and management on railway systems in India and internationally. He has presented technical papers at international seminars on simulation of electric power systems to reduce energy bills, overpowering of trains to increase throughput on existing networks, and synchronous break-free 25kV power supply for electric railways. He has worked as a consultant for electric locomotive specification for the Dedicated Freight Corridor in India.



Thursday, October 10, 2013

## Strategy Development and Implementation: Two Case Studies

**Abstract:** The Indonesian State Audit Board (BPK) and the American Trucking Associations (ATA): what do they have in common? Everything! When it comes to strategic planning and implementation, the common mistakes and lessons learned are strikingly similar across borders and organizations. That's why the Baldrige Criteria for Performance Excellence, although an American-created framework, are

universal in their usability. Join us for a spirited discussion of strategy development and implementation using the BPK and ATA case studies and examples from your own organizations.

**Biographies:** Craig Anderson is an Audit Specialist in FEMA's Grant Programs Directorate. Prior to joining FEMA in 2010, Mr. Anderson ran Global Performance Systems, Inc., an international consulting firm dedicated to bringing the power of Baldrige Performance Excellence to visionary leaders around the world. Mr. Anderson worked for 15 months in Jakarta as the lead consultant helping the Indonesian State Audit Board develop and implement a Baldrige-based strategic planning process in 2005-6.

Stefanie Karp is VP of Business Process and Performance Improvement at American Trucking Associations. Ms. Karp has 15 years of experience as a consultant in various industries: manufacturing, technology, consumer goods, and education. Her recent employment by ATA has thrown her into a new arena, where she is currently instrumental in leading the strategic planning efforts. 2013 marks her first year as a Baldrige national examiner.



Wednesday, October 16, 2013

## Cyber and Physical Threats to the Electric Power Grid

**Abstract:** The electric power grid is a synchronized system of interdependent physical generators, transmission lines, transformers, and protective equipment that is owned by a wide variety of utilities. Operating this complex system requires large volumes of data and information systems that enable accurate decision-making to optimize the balance of reliability and economics. The reliance of society on electricity requires critical infrastructure owners and operators to reduce the risk of power outages despite a growing list of evolving threats. This presentation will provide an overview of cyber and physical threats to the power grid, such as nation-state threats, cybercrime, hacktivism, insider threats, solar flares, and EMP. It will also review leading approaches to resilient operation in the face of these threats.

**Biography:** Steve McElwee oversees a variety of cyber security functions at PJM Interconnection, a regional transmission organization responsible for managing the high-voltage electric power system serving 13 states plus the District of Columbia. He is responsible for cyber threat and risk analysis, security policy, vulnerability management, security monitoring, incident response, cyber forensics, and security assessments. He has over 25 years of experience in a variety of information technology and cybersecurity roles. He has a BA in Computer Science, an MBA, and an MS in Computer Information Systems and holds CISSP certification.



Wednesday October 23, 2013

## Company Profile: Integrity Applications, Inc.

**Abstract:** If you want to hear what IAI is doing and how their CEO sees the current situation in software, or if you are looking for work, a change in work, or engineers for your company, join us October 23. Dr. Penny Hix will introduce the speakers, and Mr. Joseph Brickey of Integrity Applications Inc., will give an overview of the company and its current situation in software employment. The evening is free for IEEE members, students, and representatives of companies looking for employees.

**Biography:** Joseph Brickey is Chairman and Chief Executive Officer of IAI (<http://www.integrity-apps.com>), a mid-sized engineering and software services company with a nationwide presence, primarily supporting the intelligence community and other civil, defense and intelligence customers. With a focus on Government space and intelligence surveillance reconnaissance systems activities, Joe provides executive leadership on strategic business issues. IAI is highly regarded for its culture of excellence and is regularly listed among the nation's best places to work. IAI was awarded the Employer Support of the Guard and Reserve Freedom Award in 2011, which is the highest recognition given by the U.S. government to employers for their support of employees who serve in the National Guard and Reserve.



See more Diamond Stories, p. 10



**Durrani, from p. 4****Support Members and their Careers**

Support for industry members

- Deliver opportunities for professional engineers to enhance their skills base through continuing professional development.
- Establish Panel of Chief Executive/Technology Officers to advise IEEE on strategic issues for greater engagement with industry.
- Encourage practitioner-driven and practitioner-oriented conferences.
- Provide career support to young members and offer reduced membership fees upon graduation.

**Maintain IEEE lead in Technologies and Standards Development**

- Promote global IEEE presence in areas such as Big Data Revolution, Green Technologies, Life Sciences, Cyber Security, Transportation, Energy.
- Enhance global visibility and adoption of IEEE Standards. Encourage IEEE Societies to partner with IEEE Standards Association in developing Standards related activities.
- Ensure major IEEE role in catalyzing solutions to 21st Century Global Grand Challenges.

**Promote Innovations in Publications**

- *Mass Customization of technological information* - deliver information products constructed from across all IEEE publications customized to suit individual needs.
- Encourage multi-lingual translation of journals, serving members worldwide and opening new markets.

**Support Globalization and Outreach**

- Establish affordable member rates through new membership models and progressive benefits.
- Promote more balanced Regional representation in IEEE leadership positions.
- Deliver IEEE's Humanitarian Vision in partnership with institutions such as UNESCO, Engineering for Change, World Federation of Engineering Organizations.
- Working with WIE, establish high-level IEEE Prize for 'Outstanding Woman Engineer of the Year' to inspire women engineers.

**Michel, from p. 4**

• Provide products and services — continuing education, practitioner journals and conferences, online forums and networking opportunities — to facilitate career security for working engineers and computer scientists just as IEEE does now for academics with our journals and conferences

- Connect academics with practitioners — use IEEE Future Directions and Technology Time Machine to guide and empower practitioners in career choices

**Expand globally, including within the U.S.**

- Implement regional geographic strategies — member value in Providence is very different than member value in Singapore or Brazil
- Empower and reward Sections/Chapters for adding local value and engaging members
- Increase IEEE's impact on public policy and sentiment in all our technical areas of interest, including standards development and educational accreditation

**Lead "disruptive innovation" in our publishing and conference business**

- Provide individualized information 24/7 in customized ways for all 400,000+ members, creating an interactive web of knowledge where researchers and practitioners can communicate and build knowledge together
- Lead in academic publishing; provide a high-quality user experience for authors, readers and reviewers, in all our journals, conferences and future ventures
- Create the platform-of-choice for practicing engineers to find and exchange information

**Increase visibility, educate everyone everywhere on IEEE**

- Increase prestige, recognition and influence of the profession
- Increase recruitment, bringing the best minds into the profession
- Increase employer support; our members are their lifeblood
- Impact public policy — our members literally invent the world we live in — let's guide policy-makers worldwide

**Northern Virginia Section Announces Slate for 2014 Officer Election**

IEEE Northern Virginia Section Executive Committee has approved the following slate of candidates for the 2014 Officer Election (listed in alphabetical order by office):

**Chair**

Michael A Cardinale  
Sam Musa

**Vice-Chair**

James D "Dan" Cross-Cole  
Joel I Goodman  
Zareh Soghomonian

**Treasurer**

Thomas A Tullia  
Nima Zahadat

**Secretary**

Rhonda L Farrell  
Sandra L Hyland

**(4) Directors (2 year terms)**

Barry G Douglass  
Arye R Ephrath  
Nadim F Haddad  
Martin A Schulman  
Fred W Seelig  
Emily A Sopenisky

Terms for the four officer positions run from 01/01/2014 - 12/31/2014. Terms for the four Director positions run from 01/01/2014 - 12/31/2015.

Members who wish to become candidates by petition should submit the petition to Nominations Committee Chair Jim Magee at [jwmagee@ieee.org](mailto:jwmagee@ieee.org) no later than Friday, October 18 at 11:59pm. Include IEEE member number, office sought, and a minimum of 25 signatures (each with IEEE member number) from eligible voting members in good standing of the Northern Virginia Section (grades of Member, Graduate Student Member, Senior Member, Life Member, and Fellow).

After the petition period closes, the final slate will be published on the Section's website on approximately November 1, 2013 with candidate statements, biographies, photos and video. Candidate information, the final slate, and voting instructions will be available at [http://ewh.ieee.org/r2/no\\_virginia/election.html](http://ewh.ieee.org/r2/no_virginia/election.html) or [ieee-nova.org](http://ieee-nova.org).

**IEEE-USA President-Elect 2014 Candidates  
IEEE-USA President 2015**

Peter A. Eckstein received the B.S. degree in Electrical Technology from the New York Institute of Technology in 1967. He received an M.S. in Applied Physics from Adelphi University in 1971 and an M.S. in Management Engineering in 1974.

Eckstein is retired from Northrop Grumman Corp., where he held various engineering managerial positions of increasing responsibility. He was primarily involved in the design and development of support equipment for Navy avionic electronic warfare systems.

In addition, Eckstein is an Adjunct Professor of Physics at Suffolk County Community College, where he is responsible for lecture and lab development of calculus and algebra based physics courses, at Queensborough Community College, where he teaches physics and astronomy, and at the United States Merchant Marine Academy, where he teaches physics and engineering. Read Mr. Eckstein's campaign statement at [www.PeterEckstein.com](http://www.PeterEckstein.com).



James A. Jefferies worked at AT&T and Lucent Technologies for 33 years in engineering and executive positions including fiber optic cable development and manufacturing, Quality Assurance, and Supply Chain Management. He managed the engineering teams that delivered the first commercial fiber optic cables for the Bell System. Additional experiences included major technology transfers, innovative manufacturing development, and competitive strengthening of distribution operations and export of US built products. He also worked in the entrepreneurial sector as COO for USBuild.com in San Francisco. He has lived and worked in every region of the US with positions ranging from large companies to start-up businesses.

He received his BS in Electrical Engineering from the University of Nebraska and an MS in Engineering Science from Clarkson University. He attended the Stanford University Graduate School of Business as a Sloan Fellow and completed an MS in Management. Read Mr. Jefferies' campaign statement at [www.jamesajefferies.com](http://www.jamesajefferies.com).

**Washington Section Accepting Officer Nominations for 2014 Term**

Washington Section must fill the 2014 offices of Secretary, Treasurer, Vice-Chair, Chair, and five Director positions: one vacant position and four positions vacated by outgoing Directors Dr. George Simonis, Dr. Brian Riely, Dr. Mary Tobin, and Mr. Harry Sauberman, PE.

The nominating committee Chair, Dr. Paul Cotae, announces that nominations for these offices will be open through October 15. Washington Section has eight Directors who serve two-year staggered terms. The five new Directors (2014 vacancy and 2014-15 term) will join returning Directors Wally Lee, James Christian, and Dr. Paul Cotae.

Nominations for these positions should be emailed to Dr. Paul Cotae at [pcotae@udc.edu](mailto:pcotae@udc.edu). Nominees should be current members in good standing of IEEE Washington Section at the Member or Graduate Student Member grade or higher. Self-nominations are acceptable. All members should check for updated information posted on the Section website at [www.ieee.org/washsec](http://www.ieee.org/washsec).

Both candidates were nominated by IEEE-USA. In addition to President-Elect, IEEE-USA members will select a Member-At-Large for the 2014-2015 term. The candidates, both nominated by IEEE-USA, are Thomas G. Habetler, Professor, School of Electrical and Computer Engineering at Georgia Institute of Technology in Atlanta, Georgia, and Scott M. Tomashiro, Sr. Principal Systems Engineer at Raytheon in El Segundo, California. For more information, visit <http://www.ieee.org/election/>.

# calendar of events

## IEEE Computer Society and ASQ 509 Software SIG Meetings

Tuesday October 29, 2013

### Development of a Configuration Management Standard

**Speakers:** Al Florence and Ron Perrella  
**Register:** After October 1 (see below)  
**More Info:** IEEE informational session before this meeting!

Save the Date: November 19, 2013

**Sponsor:** IEEE-CS N. VA & DC, ASQ 509 N.VA, SSQ  
**Time:** 6:30 PM Networking and Pizza; 7:00 to 8:00 PM (Program)  
**Place:** MITRE, room 1N100 7515 Colshire Drive McLean, VA 22102; and via videoconference at FDA, Bld 66, room G512 10903 New Hampshire Ave Silver Spring, MD 20993 (other locations: see website)  
**Cost:** FREE  
**Registration:** [www.nca-scanner.org/asq/softsig.html](http://www.nca-scanner.org/asq/softsig.html)  
**Website:** [www.nca-scanner.org/asq/softsig/](http://www.nca-scanner.org/asq/softsig/)  
**Contact:** Scott Ankrum, [ankrums@mitre.org](mailto:ankrums@mitre.org)

## Congratulations!

The following local members were elevated to Senior Member grade recently:

**Baltimore Section:** Gaurav Bajpai, Matthew Stryjewski

**Northern Virginia Section:** Paulo Costa, Colin Joye, Burton Kaliski

**Washington Section:** Jonathan Agre, Daniel Cunningham, Anthony Martone, Michael Osterman

All members with 10 years of professional experience are invited to apply for elevation to IEEE Senior Member. For assistance with this process, please contact your Section Chair.



To celebrate the 50th anniversary year, the Scanner is sharing its archive of 50-year old Bulletins with our readers. Unfortunately, several Bulletins from 1963 and 1964 are missing from the archive. If you can loan us the missing issues from your personal library, please contact the Editor at [nca-scanner@ieee.org](mailto:nca-scanner@ieee.org). Meanwhile, we offer the first issue of the Scanner from 1983. Enjoy!

### Late Breaking News

**IESP Conference Postponed until Spring 2014**  
 College Park (21 August 2013) – Organizers of the IEEE International Engineering, Security, and Project Professionals Conference originally scheduled for September 10-12, 2013 at University of Maryland at College Park, announce that the conference has been postponed until the spring of 2014. The sponsors regret the inconvenience. Look for updated information on the conference website at [www.iespconference.org](http://www.iespconference.org).

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## IEEE National Capital Area Digital and Print Advertising Opportunities

The National Capital Area Scanner is accepting advertising reservations for its Winter 2013 issue. We are pleased to announce the introduction of new sponsored event listings on the eScanner website! Publicize your conference or symposium to 16,000 Scanner subscribers in Virginia, Maryland, and Washington, DC. Sponsored events will be posted on the eScanner index page, calendar, and in multimedia format and distributed to subscribers by email and in the printed Scanner. Electronic button and banner ads may also be reserved for placement on the eScanner website. With subscribers in Washington, Baltimore, and Northern Virginia Sections, the Scanner is your best outreach tool to the electrotechnology community. Additional information and deadlines can be found in the Scanner's media kit, which may be downloaded at [www.nca-scanner.org/ad](http://www.nca-scanner.org/ad). Discounts are available for multiple insertions, and IEEE members and entities may claim an additional 10% courtesy discount. Custom ad sizes and layout assistance are available. Scanner advertising is designed to fit every budget, with ad opportunities starting at less than \$100. Please contact the Scanner's Advertising Manager, Jerome "Jerry" Gibbon, IEEE LSM, for a personal consultation and to place your ad. The deadline for the Winter 2013 issue is November 15, and eScanner placement is subscribed on a month-to-month basis.

# diamond stories

Saturday, October 26, 2013

## Flexibility in Engineering Design, a One-Day Short Course

**Tutorial Description:** This course shows how Flexibility in Design can increase the expected value of a system by 10 to 30%. Flexibility adds value because it simultaneously allows the system to avoid worst outcomes, while enabling it to seize good opportunities — a “win-win” approach. The Flexibility Model recognizes that the future is uncertain. The fact is that forecasts — such as of the level of traffic at an airport, or the quantity of oil and its price — are “always wrong”. What actually happens over the lifetime of a project almost never corresponds to the initial forecasts. This reality means that evaluations based on fixed forecasts are unrealistic and lead to the choice of inferior designs.

The Flexibility Model evaluates alternative possible designs over the wide range of futures that could occur. It does this by using simulation processes, basically the ‘Monte Carlo’ methods properly adapted to the actual conditions. The course presents the essential concepts and methods for flexibility in design, illustrates them by example, and works with participants to assist them in applying the concepts to design problems that interest them. The course distributes signed copies of text “Flexibility in Engineering Design.”

**Biography:** Richard de Neufville is a systems engineer. His research and teaching focus on inserting flexibility into the design of technological systems. His 2011 book Flexibility in Engineering Design (MIT Press, with Prof. Scholtes of Cambridge University) is the latest of 6 texts on systems engineering. He has worked on projects “on all continents except Antarctica” and holds several international academic appointments. He is known for innovation in engineering and education. Numerous prizes, such as the Sizer Award for the Most Significant Contribution to MIT Education, have recognized this work. He has an MIT PhD and an honorary doctorate from the Delft University of Technology.



Lt. Col. Dr. Jason Bartolomei, USAF, worked with Dr. de Neufville to earn his MIT doctorate in Engineering Systems. For this work he received the Department of Defense Joint Achievement Medal and the award for best paper in the Systems Engineering Journal for 2012.

Lt. Cdr. Jonathan Page, USN, obtained his MIT degrees in System, Design and Management and Naval Engineering, working with Dr. de Neufville. He serves as DDG 1000 Ship Design Officer in Washington.

Monday, October 28, 2013

## Fall Networking Fiesta

**Abstract:** We are pleased to announce the event that you have all been waiting for. The original Fall Fiesta, IEEE's famous, fun networking party, returns to the National Capital Area after a 2-year hiatus. This year's Fiesta will be hosted at the lovely Germantown campus of Montgomery College. IEEE members and guests at all career levels, students, employers, entrepreneurs, recruiters, and anyone who enjoys meeting people for fun or employment are cordially invited to attend the Fall Fiesta and start their week on a festive note.

Attendees at prior years' Fall Fiestas have shared these comments: “Intellectual and social salsa!” . . . “I don't believe I have ever attended an IEEE event that had such a great mix . . . that was the magic of the evening!” . . . “Fantastic synergy” . . . “Electrical' interaction occurred among men and women and engineers of all cultures.” Bring your party hat, bring your resume, and get ready for some intellectual salsa at the Fall Fiesta with IEEE and Montgomery College. ¡Olé!



## Using Nanotechnology in Cancer Treatment: Liposomes for Drug Delivery

by Mr. Terry Kuzma

The Nano pharmaceuticals industry can be viewed as the fortunate end user of many interdisciplinary accomplishments. Naturally, the Nano pharmaceuticals industry integrates technology from biology, materials characterization, applied physics, electronics, and industrial manufacturing. In addition to these interdisciplinary techniques the Nano pharmaceuticals industry can utilize the unique material properties which occur at the nanoscale. Metals, semiconductors, and polymeric particles demonstrate novel biological, optical, magnetic, and structural properties that may dramatically differ from properties of bulk solids. Cancer survivability has increased over the last 30 years due in part to the integration of these shared assets.

It would be difficult to review all of the recent applications of Nano pharmaceuticals so we will concentrate on targeted cancer therapy using liposome based drugs. Selective targeting of a cancer drug offers two major advantages compared to historic therapies. The first advantage is that targeted drug delivery minimizes side effects which allows for robust recovery. A second advantage is a reduction of the cost per treatment since less of the drug is required.

So how do nanomaterials fit this particular niche? Nanomaterials fit nicely in this niche due to scale. Cells in the body vary in size due to functionality, but a gross approximation for discussion could ballpark the cell size to be about 10 microns. At the cellular scale, natural and man-made materials of 10 – 100 nanometers interface well with cells and still have the ability to deliver a relatively large dose of the desired drug. So size and scale make Nano pharmaceuticals a viable tool, but other traits specific to some cancers can be used to leverage this advantage. We can also tailor nanomaterials to specifically target tumor tissue while leaving healthy tissue unaffected.

Many tumor tissues accumulate small particles (20-100 nm) as compared to healthy tissues due to the anomaly called the Enhanced Permeability and Retention (EPR) effect. Nanoscale particles can preferentially enter tumors because tumor vessels are usually abnormal in architecture. Tumors have poorly-aligned, defective endothelial cell alignment somewhat analogous to a roof missing a shingle. In contrast, the endothelial walls of healthy human blood vessels are encapsulated by endothelial cells that are bound together by tight junctions. These tight junctions stop any particles in the blood from leaking out of the vessel. So tumors are like Swiss cheese, and small particles can leak into these defects. Given that healthy tissue will keep out small particles; this confines the drug delivery to the tumor, and creates little damage (i.e. side effects) in the rest of the body.

One type of man-made nanoparticle that can take advantage of the EPR effect is the liposome. A liposome is an artificially-prepared vesicle composed of a lipid bilayer. Phospholipids in an aqueous environment orient themselves in a thermodynamically stable form called a bilayer as shown in Figure 1. The liposome can be used as a vehicle for the administration of pharmaceutical drugs, DNA/RNA, tags, and nutrients. As shown in Figure 1, solid or water soluble material can be housed in the aqueous core, fat soluble material can be incorporated in the fatty tails of the lipid bilayer, and the outer core can support targeting proteins or PEG. For passive assimilation, using the EPR effect, liposomes are 20



Photo credit: Pennsylvania State University Nanofabrication Lab

-100 nm in diameter and contain a drug that will inhibit tumor growth.

First-generation liposomes did not use a protective layer that would prevent rapid removal from the body. Second-generation liposomes use an additional layer, often made of Polyethylene Glycol (PEG), to “hide” the liposome and therefore prevent rapid removal. The covalent attachment of PEG to a drug or therapeutic protein can “mask” the agent from the host’s immune system. This results in the liposome circulating for days as opposed to hours for untreated liposomes. As a result, there is more opportunity for the liposome to passively breach the defects in the tumor and selectively deliver the drug.

Doxil is one example of this targeted drug delivery technique that was approved by the FDA in 2005 for various uses. This second generation liposome based drug is used for Kaposi Sarcoma, ovarian cancer, and multiple myeloma. The active drug that is encapsulated and protected by the liposome sphere is Doxorubicin. Doxorubicin is an anthracycline, and it works by intercalating DNA to cause cell death. Free doxorubicin would seriously damage the heart without the protection and targeting function of the liposome delivery package. So Doxil is an excellent example of a proven application of the Nano pharmaceutical industry’s use of integrated technologies and traits of nanoscale drugs.

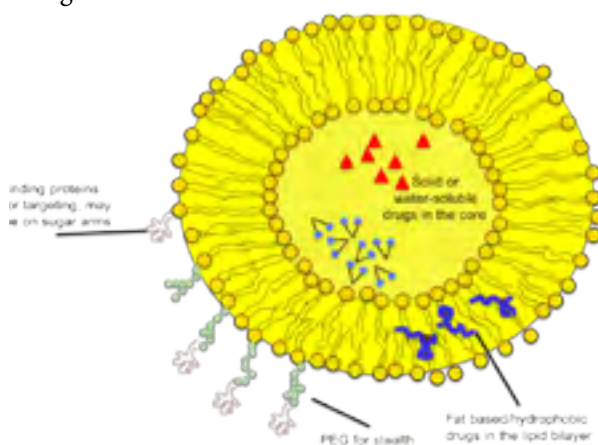


Figure 1: Liposome for drug delivery

Doxil, like many Nano pharmaceuticals, selectively target specific tissue, conserve drugs, and minimize side effects. All this is done in a cost effective manner. This example illustrates the power of integrating the sciences and unique nanoscale properties to produce modern drugs. The algorithm and ingenuity of integrating interdisciplinary techniques and with the novel properties occurring at the nanoscale will continue to contribute to medicine.

Terry Kuzma, guest author in this issue of the Scanner, is a physicist and Instructor at the Center for Nanotechnology Education and Utilization, Pennsylvania State University. Contact him at [txk107@psu.edu](mailto:txk107@psu.edu).

### Seven Rules, from p. 7

Women may keep extra pantyhose stashed in a drawer and perhaps some anti-static spray for skirts that cling; men may want to keep an extra tie (and shirt) on hand. Stain removing wipes are also handy as are a lint brush and small sewing kit, including safety pins. Keep an umbrella in your office, car, briefcase, or tote bag and use it. A wet job seeker does not look professional.

Shoes should always be clean, polished, well-heeled, not scuffed, and generally well-cared for. Invest in good shoes and acquaint yourself with a good shoemaker who can renew them whenever they start to show signs of wear.

Finally, check clothes for missing buttons and hanging threads. Remember to remove the tacking stitches and external tags from new clothing.

#### Rule #4: Err on the Side of Formality and Conservatism

Don’t give prospective employers a chance to rule you out because of your appearance. When you must make choices about what to wear, always lean toward the more formal and conservative end of the spectrum, even if you are told that the situation is “casual”. Don’t take “casual dress” or “dress down” too literally. You’re always better off dressing a bit on the conservative and formal side than on taking a gamble only to find that your idea of casual does not match that of others.

#### Rule #5: Be “Industry Aware”

The grooming and accessories that are appropriate in one industry may be extremely inappropriate for another. For example, the unshaven, renegade look that is so popular in the film industry is not effective on Wall Street. A rap star’s heavy jewelry is not appropriate in conventional business settings.

Likewise, most people have expectations for job-seeking professionals who will work in business formal settings. For example, most people expect that:

- Hands for both men and women are clean and cared for. Nails are natural and trimmed short, or they may be buffed or sport clear nail polish (or for women, conservative/neutral nail polish).
- Jewelry is kept to a minimum, with nothing dangling, clanking, or distracting.
- Likewise, eyeglasses, if worn, are not distracting.
- Hair is neat and out of the way of the face – no bizarre haircuts or styling.
- Hair colors are ones that occur in nature.
- Piercings are limited to ears and are conservative. No tattoos are visible.
- Makeup is relatively natural – no sparkles or bold colors.
- Breath, body odor, and perfumes are undetectable. Or, if an odor is detectable at all, fresh-scrubbed is a good one for a job seeker.

#### Rule #6: Be Color Savvy

The color or colors you choose to wear can affect the people around you physically and psychologically. Therefore, keep these guidelines in mind:

- Dark colors, especially black, navy, and darker shades of gray, psychologically convey power, authority, knowledge, responsibility, and success.
- Brown can convey that you are dependable and stable.
- Pastels denote softness and femininity.
- Bright colors convey cheerfulness and are attention-getting.

#### Rule #7: Clothing Details Convey Meaning

Some of the design details of clothing carry meaning in them and are typically interpreted in particular ways. For example:

- A suit coat with long sleeves, slightly padded shoulders, and a collar make you appear more powerful.
- Pleats and darts add bulk.
- Vertical lines formed by classic three-button jackets contribute to the illusion of height, as do pin stripes and dressing monochromatically.

**Seven Rules, from p. 11**

- Single-breasted jackets with a center vent are generally considered professional for men and women of average height. Double-breasted jackets look best on taller people.

- For women, skirted suits connote power, more so than pants suits. The length of the suit skirt may vary with each individual. However, slightly above the knee or to the top of the calf are professional skirt lengths. If the skirt pulls up toward mid thigh or higher when you sit, it is not deemed professional. If the skirt is too narrow or tight fitting, restricting movement or forcing you to sit on tilted hip, it is likewise not deemed professional.

**Tip:** When selecting a skirt, check the skirt slit to make sure it is not thigh length or higher. In professional attire, the skirt slit is designed to facilitate movement, that's all. Place a chair in front of a mirror and sit down. The mirror will reveal your image as seen by others. How professional do you look?

- Hosiery matching the color of skin is considered to be clean, conservative, and professional. Patterns and opaque stockings are generally not considered to be part of a woman's professional attire.

- A conservative, non-revealing woman's blouse, shirt, or shell is considered to be professional if it is long enough to tuck into the pants or skirt or sit slightly below the waistband. Shirts that ride up and reveal skin at the waist are considered to be unprofessional. A tank top or sleeveless shirt can be deemed professional but only if it is worn under a suit jacket and the jacket remains on at all times.

- Shoes that are considered to be inappropriate for most business attire include open-toes, backless shoes, mules, platforms, sandals, flip flops, and very high heels. Faces, not feet, are generally the focus in professional attire. Therefore, very trendy or attention-getting shoes are generally considered to be unprofessional, as are shoes that make a lot of noise when you walk.

- Any outfit that makes it possible for others to see a person's undergarments are not considered to be professional.

- When selecting a skirt, check the skirt slit to make sure it is not thigh length or higher. In professional attire, the skirt slit is designed to facilitate movement, that's all. Place a chair in front of a mirror and sit down. The mirror will reveal your image as seen by others. How professional do you look?

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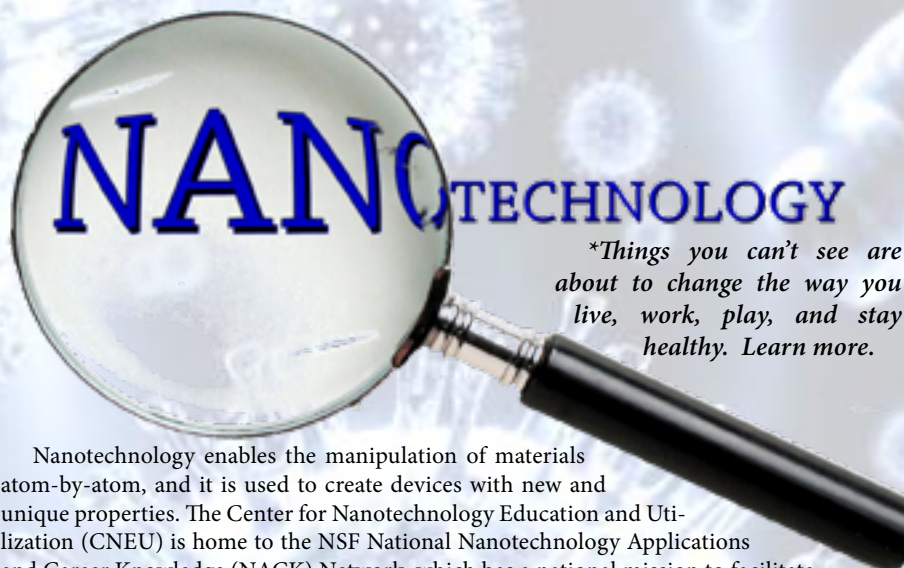
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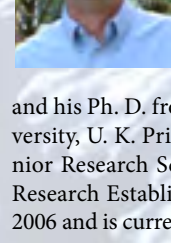


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Nanotechnology enables the manipulation of materials atom-by-atom, and it is used to create devices with new and unique properties. The Center for Nanotechnology Education and Utilization (CNEU) is home to the NSF National Nanotechnology Applications and Career Knowledge (NACK) Network, which has a national mission to facilitate the development of nanotechnology education programs at colleges across the nation. The CNEU is also the home of the Pennsylvania Nanofabrication Manufacturing Technology (NMT) Partnership, the nation's leading program in nanotechnology education. Nanotechnology education is coming to the Washington, DC area through partnerships between local colleges and universities, and the CNEU is mentoring and facilitating these and similar developments.



Robert K. (Bob) Ehrmann is Managing Director at the Penn State CNEU. Mr. Ehrmann previously worked for 23 years at Corning, where he held positions in engineering, product development, production and project management. Mr. Ehrmann earned a BS degree in Ceramic Engineering from Rutgers University as well as an MBA from West Virginia University.



Dr. Osama Awadelkarim is Associate Director at the Penn State NACK Network. Dr. Awadelkarim received his B. S. in Physics from the University of Khartoum, Sudan, and his Ph. D. from the J. J. Thompson Physical Laboratory at Reading University, U. K. Prior to joining Penn State, Dr. Awadelkarim worked as a Senior Research Scientist at Linkoping University and the Swedish Defense Research Establishment. Dr. Awadelkarim was Jefferson Science Fellow in 2006 and is currently a Senior Science Advisor for the U.S. Department of State.



Dr. Laura Hills is a career success coach. She combines personal and professional development for career professionals focusing on leadership, relationship-building, management systems, team-building, work/life balance, ethics, and communication skills. She helps career professionals to accelerate their careers, to become more productive and effective, and to find greater reward in their work. Dr. Hills is an engaging trainer, coach, consultant, author, and speaker, and the president of Blue Pencil Institute, LLC, in Fairfax, Virginia ([www.bluepencilinstitute.com](http://www.bluepencilinstitute.com)). Reach her at 703-691-8468 or [lhills@bluepencilinstitute.com](mailto:lhills@bluepencilinstitute.com); Twitter: @DrLauraHills; Facebook: Blue Pencil Institute; Blog: Blue Pencil Sharpener™ at <http://www.bluepencilinstitute.com/blog/>. The Scanner wishes to thank Richard Swerdlow for the Employment Network's significant contributions to this issue.

**SCANNER STAFF****Editor-in-Chief**

Monica A. Mallini, PE  
703-765-6303  
[nca-scanner@ieee.org](mailto:nca-scanner@ieee.org)

**Associate Editor**

Harry Sauberman, PE  
703-868-3457  
[nca-scanner@ieee.org](mailto:nca-scanner@ieee.org)

**Northern Virginia Section Editor**

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**Washington Section Editor**

Wally Lee  
703-765-6303  
[w.h.lee@ieee.org](mailto:w.h.lee@ieee.org)

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[ronald\\_alloysius@ieee.org](mailto:ronald_alloysius@ieee.org)

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**Webmaster**

Rex Klopfenstein  
703-323-5789  
[r.klopfenstein@ieee.org](mailto:r.klopfenstein@ieee.org)

**Advertising Manager**

Jerry Gibbon, IEEE LSM  
J & BG Consultants LLP  
202-276-2265  
[j.t.gibbon@ieee.org](mailto:j.t.gibbon@ieee.org)

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