



Celebrating 125 Years
of Engineering the Future

Volume 4 Number 5
Sept / Oct 2009

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Editor's Notes

Irfan Lateef, a Systems Engineer for AT&T Research Labs in Middletown was the first with a reply to our question – “what was the greatest invention of the past 125 years – and what do you think the next big thing will be?” His reply: ***“I think transistor was the biggest invention in the last 125 years and Genetically engineered drugs and nano devices for medicine will be the next big thing.”***

Thanks for your reply Irfan! Irfan received our thank you gift for this opinion.

Societies News

MICROWAVE THEORY AND TECHNIQUES SOCIETY SCHOLARSHIP

* The IEEE Microwave Theory and Techniques Society (MTT-S) will award up to ten \$1500 undergraduate/pre-graduate scholarships for Spring 2009. The purpose of the scholarship program is to attract undergraduates to the microwave and RF discipline, and to encourage them to pursue graduate degrees in the field.

* The applicant must be an undergraduate student in electrical engineering (or related field) at the time of application, and should be enrolled full-time in his/her final year of the undergraduate program, first year of graduate studies, or combined B.S./M.S. program during the 2008-2009 academic year.

* The student must identify a faculty mentor who will supervise the applicant's project or thesis work in the microwave/RF area. Alternatively, project work may be conducted in conjunction with industry, but a faculty mentor must still be identified.

* Applicant must be an IEEE student member, and the faculty mentor must be an IEEE MTT-S member.

* There are no citizenship requirements. Awards will be distributed globally based on society membership. Awards are limited to one per faculty mentor.

* Funds may be used for project materials and/or stipends.

* Awardees are also encouraged to attend an MTT-S sponsored conference. Travel expenses are partially reimbursed (over and above the \$1500 award).

Download the application form here: <http://www.mtt.org> => Students)

Region 1 News

SSCS of P/CJ SECTION - September 17th marked the inaugural event of the of the Solid State Circuits Society of Princeton/Central Jersey Section. Information about this new chapter can be found at <http://ewh.ieee.org/r1/princeton-centraljersey>

Chapter, Affinity Groups, Section News

MICROWAVE THEORY & TRANSMISSION/ELECTRON DEVICES/PHOTONICS CHAPTER- JEFF SINSKY, NEW CHAIR



Dr. Jeffrey H. Sinsky

Dr. Sinsky received his Ph.D in electrical engineering from The Johns Hopkins University in Baltimore, MD in 1997. After spending 13 years at The Johns Hopkins Applied Physics Laboratory in the satellite communications industry, in 1997 he joined Bell Labs in Holmdel, NJ, to pursue research in wireless communications. Currently, he works in the Optical Subsystems and Advanced Photonics Research Department at Bell Labs under Randy Giles, where his research interests include high-speed data transmission over electrical backplanes, high-speed electronics for 100 Gb/s optical transmission, microwave signal processing for optical communication systems, 100 Gb/s electro-optic packaging techniques, and microwave photonics. Jeff took over from Dru Reynolds who has joined the WIE group and continues as the newsletter editor.

Jeff is planning some great talks for next year while wrapping up 2009 – if you would like to get involved with this chapter, please contact him at sinsky@ieee.org.

WOMEN IN ENGINEERING AFFINITY GROUP - PAULA MULLER, CHAIR



The NJ Coast WIE was officially founded on June 4th with twelve IEEE members. Officers elected include Paula Muller, Margaret Lyons, and Fatima Shehadeh. It was quickly decided that the main focus this year will be outreach to students in grammar and high school. Our first project an Engineering Career Day will be held at Neptune High School on Dec 2nd. Students interested in science and engineering will be invited by their principal to attend one of a variety of sessions where they will have an opportunity to engage in hands on exercises designed to emphasize the specialty presented. Eight volunteers are individually preparing a 40 minute demonstration based on their own career. It is expected we will reach out to more than 100 students.

In addition to this main activity: our members have participated in the 2009 Region 1 WIE Professional Development Seminar in September in White Plains.

Currently, the group is fully engaged in a second initiative at the High School Level - a Shadowing Program for seniors at local companies. (see article under student news on the last page of this newsletter).

We completed a project on October 7th, which was spearheaded by our member Cindy Poon, who created a tour of her lab at Fort Monmouth. More than 40 students came away from that experience enthused about the "cool stuff" and hopefully will begin to find their way into engineering careers as a result. If you want to join us or learn more information please visit our web site at:

<http://ewh.ieee.org/r1/njcoast/NJcoastWIE>

PACE ACTIVITIES – RAKESH BISARIA, CHAIR

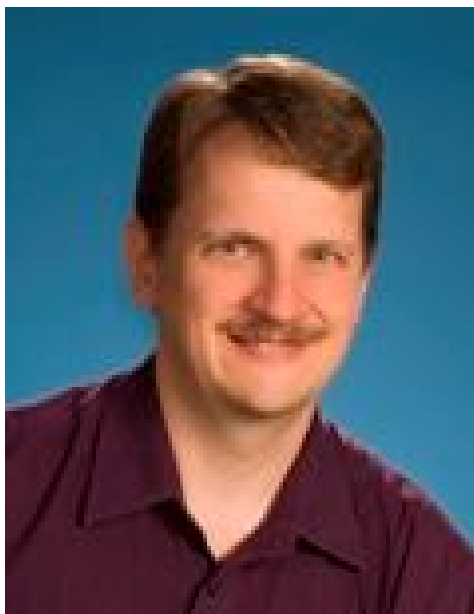
The PACE group started the year with a Networking seminar featuring faculty from engineering colleges and universities. The impact of economic slowdown on specific industries was discussed, along with solutions for alternative career paths and available educational opportunities. We plan to continue to seek information about areas that are likely to receive funding and witness employment growth. A member of NJ Coast, Frank Laslo – commented, "This event was well done with in depth information and this is progress in terms of the kind of PACE events we have had. This talk could with more planning easily expanded to a half a day seminar and needs to be considered for next year"

Brenda Belkin & Rakesh Bisaria, founders of IT companies, were invited to talk about the existing IT services landscape and the areas that are likely to experience good growth. The talk was marked by lively and productive discussion and the general view emerged that niche areas like green data center initiatives and wireless services will continue to create opportunities.

Notwithstanding our common employment concerns, most of us still would like to stay on top of our investment portfolios; so we invited Paul C. Lobosco, founder of an investment company, to explain how to deal with underperforming portfolios in a low interest rate environment. Paul put the global financial crisis in a historical context and provided investment pointers on energy, technology and infrastructure sectors. We are already scheduling talks in 2010 about alternative career choices – we hope you will join us for many of them.

TK Srinivas, Chair of the Section, noted that many attendees stayed past the 90 minutes allotted in order to engage with each other and the presenter.

AEROSPACE & ELECTRONIC SYSTEMS / TECHNICAL MGMT CHAPTER– LUIS RIESCO, SECTY/TREASURER



Dr. Jonathan Gardiner, NASA

“The James Webb Space Telescope is the successor to the Hubble Space Telescope which will look backwards in time to find the first galaxies that formed after the Big Bang, to trace their evolution into galaxies like our own Milky Way, and to connect the formation of stars and planets with our own Solar system”

Dr. Jonathan Gardiner, Chief of the NASA Observational Cosmology Laboratory; spent 4 1/2 hours engaging in discussion and presenting a talk outlining the top 10 astronomical discoveries of the last 10 years, and the role that space telescopes have played in those discoveries. In addition, he discussed how the Hubble has been upgraded and why the Webb is being developed. Attendees numbering more than 120 included: students (both HS and University) and educators; interested technical professionals; and the general public. The talk was a co-sponsored event by the combined chapter of Aerospace and Electronic Systems/Technical Management Societies and Monmouth U.

The AES/TM Chapter is very active in sponsoring interesting topics and activities – but needs more volunteers – do as little or as much as you like – for more information, contact Luis at luis7co@verizon.net.

NJ COAST SECTION ELECTIONS FOR VOLUNTEER POSITIONS 2010 - TK SRINIVAS, SECTION CHAIR



Dr. TK Srinivas

Elections will be held in December 2009. To see all current positions in the Section, go to the Section web site at <http://www.ewh.ieee.org/r1/njcoast/> and click on the "Executive Committee" link in the left panel.

Any IEEE member in the NJ Coast Section area may run for any position. Please note: there are currently 10-12 vacant positions. Volunteering is a great networking tool and we can use your expertise! More information about volunteering can be found at <http://ieee.org/web/volunteers/home/index.html>.

Anyone interested in learning more, should contact TK Srinivas, Section Chair; at tksieee@gmail.com

Career Management

RESUME RAMBLINGS, POINTS TO PONDER – DRU REYNOLDS

Focus on Technological Results - Technical candidates usually make one of two critical errors on their resumes -- either the document is excessively long with excruciating detail on every assignment ever completed, or too short with hardly any descriptions at all. NO ACRONYMS ! This seems more prevalent on resumes of those in defense - Spell it out if it's important – if not, omit it! Do not put BOTH the acronym and the entire phrase. Look for a balance in showcasing your achievements.

What to Include - For each position held, give a brief synopsis of the scope of your responsibility. Then show how your performance benefited the company. Give examples of how past initiatives led to positive outcomes such as enhanced efficiency, faster time-to-market, monetary savings. Measureable Accomplishments are powerful - include actual performance figures. Focus on your most impressive technical projects/accomplishments. What types of challenges did you face? What did you do to overcome the challenges? How did your performance improve the organization's bottom line?

For contract work, provide a bulleted list of your top projects, a reason for hiring you, scope of the project, your approach to the project, work performed, and results.

Know Your Buyer, Who You are Selling To ? – The Buyer is Who the Position Reports To

Upper Management ? sets strategic direction and how best to utilize funding, new product decisions, and watching and responding to trends in the marketplace. Profitability is the bottom line – The Why?

Middle Management? is responsible for getting it done ! When What and Where?

Reynolds Recruiters has introduced a new budget resume service – contact us for details



Dru Reynolds –
Reynolds, Recruiters

Brain Teaser Challenge – Butch Shadwell

Solution from last issue

While lying in the hospital bed I started thinking of my days of doing applied research in nuclear medicine. Then I knew what the next BTC would be, "...how does molybdenum-99 become technetium-99m?"

This was not a very difficult problem if you happened to know that molybdenum-99 was an unstable radionuclide and that it would usually have a beta decay to technetium-99m. Atomic number 42 becomes number 43. The molybdenum has a half life of about 2.8 days and the resulting technetium has a half life of about 6 hours before it has a gamma emission and changes to the more stable isomer of technetium-99. These two forms of technetium-99 are called isomers because they are identical in every way except that the arrangement of neutrons and protons in the nucleus is in a meta-

stable configuration. After a gamma event the nucleus is in a lower energy state where it may eventually have a beta decay and turn into Ruthenium-99. But I bet you already knew that...

Challenge for September/October -

Little Schlomo had nothing on his mind as he rolled the wheel down Pearl Street with his stick. The sound this perfect circle made as it rumbled along, drew his thoughts away from here and now. It was 1889, and for a ten year old in New York, life was lived in the street, and things were hard. Uncle Lenny, who had been living with his family for as long as he could remember, was sure his ship would come in any day now.

Even though he knew it was rubbish, sometimes Schlomo would enjoy listening as his uncle would explain his latest get rich quick scheme. It was on a

Tuesday, as he heard his Uncle Lenny describe his new electric light business. As you know, light bulbs were pretty expensive, about a dollar a piece, and they didn't really last that long. Lenny's idea was to sell folks lower voltage light bulbs which were a little cheaper and would last a little longer. He planned on buying transformers to reduce the voltage. What turn ratio did he need to run 25 volt bulbs? Hope you remember your electrifying history.

Editor's Note:

The answer for this month's challenge will be in our next newsletter – or you can reply to b.shadwell@ieee.org

Area News

FORT MONMOUTH - SCIENCE, MATH, & RESEARCH SCHOLARSHIPS OPEN - Smart Program Applications Being Accepted

Applications can be submitted until December 15th for the 2010 cohort of the SMART Program. <http://www.asee.org/fellowships/smart/> The Science, Mathematics And Research for Transformation (SMART) Scholarship-for-Service Program is a DoD program aimed at increasing the number of civilian scientists and engineers working at DoD labs. SMART is a competitive opportunity for students pursuing a degree in Science, Technology, Engineering, and Mathematics (STEM) disciplines to receive a full scholarship and be gainfully employed upon degree completion. The Army had an incredibly successful 2009 cycle resulting in 109 students being placed in Army laboratories with higher expectations for 2010. The program offers:

- STEM undergraduate and graduate degree support
- Full tuition and education related fees
- Portable scholarships and fellowships
- Cash award up to \$41,000 depending on prior educational experience
- Paid summer internships Health Insurance reimbursement allowance up to \$1,200 per calendar year
- Book allowance of \$1,000 per academic year
- Mentoring
- Employment placement after graduation

TK Srinivas, Chair

**Wei Sui
Vice Chair**

K. Raghunandan Secretary

**Rulei Ting
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COMPUTER DEVELOPMENT at CAMP EVANS, WALL TOWNSHIP, NJ

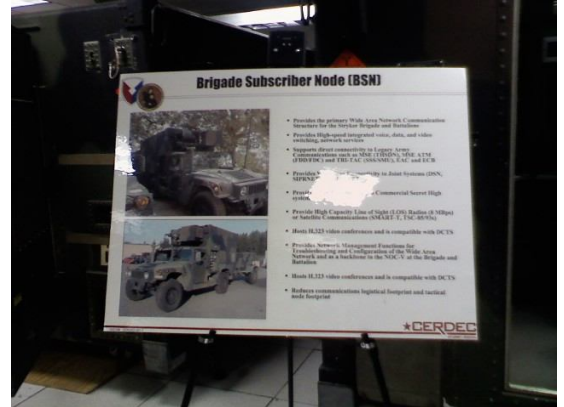
Throughout the 1940s and 1950s, a who's who of the computer and electronics industries worked at or with Camp Evans. They include Frederick Terman, a founding father of Silicon Valley; Bill Hewlett, of Hewlett-Packard fame; Howard Vollum, co-founder of oscilloscope giant Tektronix; Jay Forrester, known for perfecting magnetic memory; and Kurt Lehovec, a pioneer of light-emitting diodes and chip assembly techniques. Some Highlights:

- **1941: Designs for parabolic radar antenna (researchers believe was a Camp Evans project) inspired U Penn physics Prof. John W. Mauchly, to continue exploring digital computing, leading to the secret "Project PX" in 1943. Its general-purpose design augmented with stored-program methods was the beginning of the modern computer industry.
- **1943-1945: Several members of the Evans staff, with others, on the National Defense Research Committee's Vacuum Tube Development Committee, based in the Empire State Building.
- **1945: Veterans of the camp, led by Arthur Adamson and Lloyd Christianson, form Electronic Associates (EAI), which became a leader in analog computing; others vets founded Interdata (Perkin-Elmer, Concurrent),
- **1947: Camp Evans partners with U Penn. contracting to use its differential analyzer, "Required for numerical evaluation of integral equations."
- **1948: Research director Harold Zahl witnesses Bell Labs' new invention, the transistor, and becomes a strong advocate for its use in the Signal Corps. Zahl also ensured that the invention was made public
- **1953: IBM and MIT personnel visited Camp Evans to learn about cathode ray tubes, applying the knowledge to a basis for computers in the U.S. Air Force SAGE air defense system.
- **1956: Camp Evans decided to build its own computer – with Sylvania winning the contract, resulting in a Mobile Digital Computer (small enough to fit inside a 30-foot Army truck). They were among the first all transistorized computers, and shared data between computers. This led to Fielddata, becoming the modern ASCII system. Meanwhile:
- **1956: IBM picked Camp Evans to host its first Scientific Computing Seminar. The seminar evolved into SHARE, which was the IBM user group that pioneered open-source software.
- **1957: Camp Evans was a testing lab for the Army and RCA's "Micro-Module" project. Micro-Module was an early competitor to integrated circuits and helped spread component miniaturization in the computer industry.

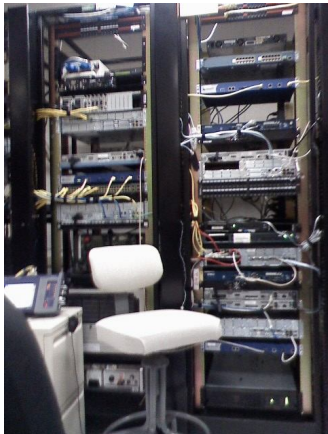
NEPTUNE TWP HIGH SCHOOL

Neptune Twp HS Engineering Shadowing Program - Jocylen Figueroa, Grade 12

Students who are interested in engineering signed up for the program and were assigned to the participating companies in pairs. The students participate in hands-on activities and lessons. I was lucky enough to be part of one of the first three pairs to actually visit a company. "My partner, Jude Janvier, and I were sent to Fort Monmouth and although I had visited the Fort before, Jude and I had to go through about fifteen to thirty minutes of security just to get onto the base. Security is a serious requirement because Fort Monmouth is a federal government facility where much of the U.S. Army's research and development of hi-tech equipment is performed. After getting signed in and acquiring the required visitors badges, Jude and I sat in the waiting area until we were escorted to Cindy Poon's office. (Cindy Poon is in command of communications technology, and is also the coordinator of the shadowing program at Fort Monmouth.) Ms. Poon then led us to a sector where communication hardware is being worked on.



Jude and I were put to work mounting brackets onto the JNN (Joint Network Node) and BNCP (Battalion Command Post) equipment. Dave and John, our mentors, explained the purpose for the brackets. The brackets are designed to secure systems into a communication shelter or a transit case. A Humvee transports the shelters; soldiers carry the transit case. The transit cases contain a lot of hardware which makes them heavy and difficult to carry.



Once we finished securing the brackets onto the equipment, Jude and I were able to test that software to make sure that there were no errors in the memory. Jude used a computer, which ran on a program called hyper terminal, to determine whether there was anything wrong with the software. I transferred the battery cable and the console cable to the hardware. We worked right up to the last few moments before we had to leave. It turned out that all the equipment had real-world applications. To know that what we did contributes to the efforts of our soldiers overseas was extraordinarily rewarding.

After speaking with other participants who shadowed different companies, it seems that the program is a success. Each pair learned and experienced diverse tasks; tasks that can never be taught in the traditional classroom setting.

Two weeks seems to be a long time to wait before I get to shadow another company, but it is worth it!