

The Current Source

Newsletter of the Schenectady Section of the IEEE

Solar Photovoltaics Technology: The Beginning of the Revolution

70th Steinmetz Memorial Lecture



Dr. Cherrice Traver presents the Steinmetz medallion to Dr. Kazmerski

by Becky Nold

Dr. Lawrence Kazmerski brought his high-energy contribution to a long line of Steinmetz speakers on April 27, 2009 at the 70th Steinmetz Memorial Lecture.

On a summery evening in the Nott Memorial at Union college, he took his audience on a colorful and exciting trip starting with Vanguard, the first solar powered satellite in the 50's. Then his talk went on to the future, where solar photovoltaic has the potential to fundamentally change our energy mix and the resulting impact on our planet. After handing out several colorful "Kazmerski" solar ties and scarves (a side business from the '80's when solar funding was in question), Kazmerski gave a summary of the solar industry now, where venture capital outweighs federal funding by 10 to 1. The present

crystal silicon technology, while growing, is meeting resource and technology limits. Beside it the rapidly growing thin-film industry promises to improve availability and price. Finally, on the horizon, are disruptive technologies that promise breakthrough through simplicity.

Kazmerski, the Executive Director of Science and Technology Partnerships at the National Renewable Energy Laboratory, believes that the federal government should act to support long-range research that may not otherwise attract venture capital, which has a shorter time line for product growth. He clearly believes that well-placed dollars will change the industry in ways that will be necessary in the decades coming.



Steinmetz Lecture attendees on the stroll from dinner at the Hale House to the lecture in the Nott Memorial

As part of his visit, Dr. Kazmerski visited the grave of Charles P. Steinmetz in Vale Cemetery, and had his picture next to the monument as part his presentation. He was appreciative of the connection between Steinmetz, Union College and the city of Schenectady, and was glad to be a part of the evening.

Thanks are due to the Steinmetz Lecture Committee, led by Cherrice Traver, Dean of Engineering at Union College, for coordinating the dinner and lecture.

Chairperson's Message

By Zongqi Sun (Sonnjie)

2009 is the 125th anniversary of IEEE. As IEEE members, we can all be proud of this world leading professional association for the advancement of technology with its history of innovation and excellence. IEEE is now leading the way in energy, nano, bio, info and other technologies, which are fundamentally changing this world and our lives. Solar photovoltaic, powering the future with nanotechnology, using brain signals for communication and diagnosis – these are the topics on the list of the section activities carried out this year. Besides technical talks, tours, and field trips the section holds professional activities to help members advance both technically and professionally. To find detailed info, please go to <http://www.ieee.org/schenectady> Your participation and suggestions are welcome.

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What do you want to hear more about?

If you have suggestions for speakers or topics that might be of interest to the members, please contact the Section Chair, Zongqi Sun (Sonnie), [zqsun \(at\) ieee.org](mailto:zqsun@ieee.org) or the Membership Chair, Lou Tomaino, l.tomaino@ieee.org

Open Position

Life Member Chapter Chair – Represent the interests of the Life Members in the Section. This will include attending Executive Committee meetings (held monthly) and possibly setting up a program or event of special interest to older members. Contact Shadrack Orero (left) to volunteer.

Local Middle School Makes Impressive Finish in Future City National Competition

by Marc Happes, with details provided by Peter Sutherland

Future City is a national competition, sponsored by engineering companies and societies, which introduces middle school students to real-world multidisciplinary engineering problems in a fun and interactive way. Participants are required to address present-day social, economic, and environmental concerns by using engineering, science and a whole lot of creativity. According to the Future City mission statement, the program is intended to inspire students to explore engineering as a career.

At the regional competition held on January 17 at Hudson Valley Community College, Farnsworth Middle School of Guilderland, NY finished first over more than forty other local teams that were represented. The team of 12 students from Farnsworth created a self-sustaining Brazilian city dubbed "Cibola" after the original mythical civilization. The team combined current trends and concepts with space-age technology to solve problems for food production and distribution, energy and transportation to name just a few.

Farnsworth Middle School competed in the Future City National Finals, February 17-18, held in Washington DC. The Farnsworth students finished a very respectable 10th place out of 38 teams from across the country in the national competition. The team also picked up the ninth-annual IEEE-USA Best Communications System Award, for the most "efficient and accurate communications system". A hand-held "Personal Education Device", or PED, is the featured element of the cities communications system.

The students presented their city on March 31 at a lunch program for the IEEE Schenectady

Section. Cibola, was one of seven mythical cities of gold. Unlike the original Cibola, the futuristic heir is more realistic. The namesake created by the Farnsworth students, featured a skyway filled Jetson's-like pod cars powered entirely by methane where traffic is controlled by computer; food production facilities utilize stem cells to create the animal products consumed by residents; self-sufficient water purification/recycling system to maintain fresh water to hydrate the community. The Farnsworth team devised unique methods to obtain renewable energy sources from geothermal, wind and solar sources in order to heat and power their city. Even the bridge that crosses the river was designed to have a significantly larger capacity than what was currently in demand and addressed means of future expansion.



Farnsworth Middle School, "Cibola", at IEEE Meeting March 31, 2009
Left to right: Zubin Mukerjee, Joseph Sipzner, Abigail Schnoor and Tom McGreevy

The team first simulated their design in SimCity, a computer game that simulates the growth from a small town into a large metropolis. In the second phase, the students constructed a scaled model from recycled materials to demonstrate a small cross section of their city.

The most valuable lessons taken from the project extended beyond teamwork and technology; the students were provided insight into the everyday problems and

concerns that society is faced with. For each member of the team, this project shed light on the importance of engineers and the work we do to solve these problems. None of the students hesitated to raise their hand when asked if they would consider engineering as a future profession.

The success of the Farnsworth Middle School Future Cities shows the impact of growing up in Tech Valley and exemplifies the benefits of providing engineering-education in secondary-level-schools. Congratulations to the students on their success!

For more information on the Future City competition, or to be a volunteer, please visit: <http://www.futurecity.org>.

Schenectady Section Supports Local Future City Competition

by Becky Nold

The Schenectady Section provided a sponsorship donation to the local Future City competition on January 17. In addition, the Section provided one of many monetary awards available to participants. Titled "Excellence in Low Impact Energy Generation and Use", the award was judged by Rebecca Nold, Newsletter Coordinator, Einar Larsen (both of GE), and Mark Happes, Student Activities Chair (of Audio Video Corp.). The "Excellence in Low Impact Energy Generation and Use" award was presented to Stephen and Harriet Myers Middle School for their city SEJJA. Peter Sutherland presented the award later in the day.

Peter Sutherland, another Section volunteer (also of GE) had the additional primary role for the day as one of the judges in the overall competition.

Call for Contributions

The Current Source is always open for contributions for future newsletters. There is certainly much more going on in this area than gets profiled in the newsletter. Do you have an article about a historical moment, a future event, or a notable discovery that might be of interest to the local IEEE community? How about a picture of some momentous occasion? Please contribute! Staff editors can even take your bulleted list and turn it into printable article if writing does not appeal to you. We do however have to reserve the right to refuse any material of a commercial nature.

The Current Source is published twice a year by the Schenectady Section of the IEEE. If you are interested in volunteering for *The Current Source* or wish to submit material for consideration, please contact the editor.

Lunch events are held on average once per month. Most of you are receiving notices electronically for every event. If you are not, please update your profile on the IEEE website. Events are also advertised on the local Section website at <http://www.ewh.ieee.org/r1/schenectady/events.html>. Please check often! Reservations are required due to the cost of the lunch (as paid by the Section). All events are free for IEEE members who RSVP by the deadline, \$10.00 for non-members and all who fail to RSVP by the deadline stated for each event.



Kathryn Conway demonstrating two generations of an LED lighting system. 2/27/09



Dr. Pradeep Haldar speaking on nanotechnology's impact on alternative energy technologies. 2/13/09