



# The Current Source

Newsletter of the Schenectady Section of the IEEE

## IEEE Schenectady Section Celebrates Centennial

This year marks the Centennial year of the IEEE Schenectady Section. A wide variety of events have already been held and are being planned by your Section and Society Chapter officers.

Many of you took active interest in attending the Centennial Series Presentations held in the first half of the year. Speakers included Ed Owen, who paid tribute to the pioneering achievements of William Stanley Jr., whose early work in the area of ac current systems and apparatus continues to influence the work of engineers even today. Jim Stewart captivated the audience with his presen-

tation entitled, "Cohoes and Niagara: Mills, Canals, and Hydropower," a look back at different engineering solutions developed to harvest water power in the days gone by. The Section also featured a host of speakers such as Jose Daconti, Peter Reichmeider, and John Brown, who gave talks on current and emerging technologies and processes. If you happened to miss any of these presentations, do not despair. You can still download the presentation slides by visiting the "Events" page on the Schenectady Section website ([www.ieee.org/schenectady](http://www.ieee.org/schenectady)). Centennial Series Presenta-

tions are being planned for the rest of the year. Details of these events will be sent to Section members via e-mail and also posted on the Section website.

In recognition of the Section's Centennial, the IEEE Region 1 summer meeting will be held in Schenectady. The meeting will be held August 15–17 at the Ramada Inn and Convention Center and will give an opportunity for Region 1 Section officers to learn more about their responsibilities, and about the resources and assistance available through the Region and IEEE operations. As in the past, the meeting is open

only to invited Section officers.

I am pleased to inform you that the Steinmetz Memorial Lecture is being revived this year thanks to the efforts of the Section's Steinmetz Committee. Dr. Paul M. Horn, Senior Vice President and Director of Research at IBM, will present the 66th Charles P. Steinmetz Lecture Monday, Oct. 13 at the Memorial Chapel of Union College, beginning at 7 p.m. An advertisement for this event appears on page 2.

—Editor

## Paul de Mello Receives IEEE Concordia PSE Award

The 2003 IEEE Charles Concordia Power System Engineering Award was recently presented to a leader and contributor in power systems dynamics whose work has profoundly affected the success of the electric power industry. F. Paul de Mello, consulting engineer from Burnt Hills, N.Y., has been named recipient of the newly established Charles Concordia Power Systems Engineering Award for "broad and pioneering contributions to power system control, dynamic simulation and modeling, and the application of these techniques to high voltage transmission sys-

tem planning, design, and operation."

The award was presented at the Power Engineering Society General Meeting 2003 in Toronto on July 15. GE sponsored the award.

Mr. de Mello is an independent consulting engineer doing research in modeling of power system equipment for dynamic simulation. He lectures and consults on power system analysis. He received his bachelor of science degree in electrical engineering in 1947 and a master's degree in 1948 from the Massachusetts Institute of Technology. He was a system

planning engineer from 1948–55 for Rio and Sao Paulo Light and Power in

Brazil. In 1955 he joined GE in Schenectady, where he was an application engineer involved in power system dynamic studies and modeling of

electrical machines, excitation control, prime mover systems, and boilers. In 1969 he became a founding member of Power Technologies, Inc. (PTI) and was a principal engineer doing power system design and development of power system simulation tools. In 1973 he was named

Vice President of PTI and directed consulting services for the firm. He conducted and guided research on dynamic simulation and modeling, and directed projects for the planning, design, and operation of power systems. In 1987 he retired from the firm and became an independent consultant.

Mr. de Mello is recognized for his broad and pioneering contributions to power system control, dynamic simulation and modeling, and the application of these techniques to high-voltage transmission system planning, design, and operation. He was a pioneer, both at GE and



Paul de Mello

# 2003 Section Officers

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The Executive Committee also includes appointed Chairs of the following active Chapters within the Section.

## Power Engineering Chapter (PES-31)

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## Microwave Theory and Techniques Chapter

MTT Chair Position Open

## Steinmetz Committee

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PTI, in the development of digital computer tools for transient stability analysis. His contributions in power system dynamic modeling, numerical integration implementation, and control system design are the foundations of much of the development experienced in this field during the past 40 years. He was a pioneer in the development and application of power system stabilizers, which have become an integral part of power system design, allowing use of high-response excitation systems and increasing the capability of power systems. He developed computer techniques for simulation of complex boiler dynamics and synthesis of multivariable boiler-turbine controls. This has allowed powerplants to utilize increasingly sophisticated controls to optimize plant response. He has made pioneering contributions to the development of automatic generation control and its implementation using digital computers. Such control is used by major control centers in the United States and around the world to regulate frequency and tie-line flows. The coordinated operations of large power systems depend on such controls.

Mr. de Mello has authored more than 80 technical papers that relate to the electric power industry. He is a Fellow of the IEEE, an ISA

Fellow, and a member of the National Academy of Engineering.

He is widely regarded as a mentor by many engineers working within the power engineering field. From a professional family himself, his children have all followed in his footsteps. His father was a world-renowned medical scientist specializing in microbiology and tropical medicine. He had four children with his first wife Barbara: Robert, Doug, Pauline, and Steven. Barbara died following a long battle with cancer. In 1989, Paul was remarried to Margaret Leger Handron.

Paul considers one of his greatest career achievements to be his participation and leadership in the Itaipu project, leading a group of 19 engineers from PTI and two other consulting firms. They conducted transmission planning for Itaipu and its integration into the South-East and South Brazilian Networks. The author's first exposure to Paul was in understanding the "de Mello Feedback Scheme," later known as the "Power Systems Stabilizer." Considering that Paul and Charles Concordia co-authored a well known paper introducing the concept of power system stabilizers in 1969, it seems most appropriate that Paul would be first to receive the Concordia Award.

—Edward L. Owen

### 66th Steinmetz Memorial Lecture

Dr. Paul M. Horn, IBM Senior Vice President and Director of Research

#### "The Future of Information Technology"

Monday, Oct. 13, 2003  
7 p.m. in the Memorial Chapel, Union College  
Schenectady, New York

More information is available at the Steinmetz Memorial Lecture series website (<http://engineering.union.edu/SteinmetzMemorialLectures/>). A flier containing details about the dinner and associated events will be mailed.



On the web at: <http://www.ieee.org/schenectady>

# The history of electrical engineering in our area

We all have some concept of the importance of GE in the history of electrical engineering; of the contributions of Edison and Steinmetz and their early colleagues. But did you know of all that local inventors, scientists, and engineers have contributed to our field from the earliest days of this nation to the present? This column, to run in every newsletter, will attempt to give a brief synopsis of the amazing inventions and contributions made right here in our backyard. If you have any people or ideas you would like to see profiled, please contact the author at [creis@igc.com](mailto:creis@igc.com).

As electrical engineers, we have all spent time calculating using trigonometric equations and imaginary numbers, for which we have Charles Proteus Steinmetz to thank. Until his 1891 formulation of the law of hysteresis, the power losses in machines could be known only after they were built. Using Steinmetz's equations, we all can determine the losses in our designs before starting the construction.

Steinmetz started his career by developing the first commercially successful alternating current motor. Along the way, he invented the metallic electrode lamp and the three-phase circuit, designed and built the first ac

generating facility at Niagara Falls, and the list goes on; this short article couldn't begin to cover them all. In his opinion, his most important contributions were in the field of electromagnetism, the development of a practical method of calculating alternating currents using complex numbers, and his research on lighting. Steinmetz's contributions were so widespread and so fundamental to everything that we do as electrical engineers that one could argue he had more of an impact than Edison.

Charles Steinmetz (born Carl August Rudolph Steinmetz April 9, 1865 in Breslau, Germany [now Poland]) was forced to leave home because of his opposition to the policies of the repressive Bismark government. Upon arriving in America a few years later, Steinmetz started working for Rudolph Eickemeyer, a fellow German emigrant who was getting into the business of ac streetcar motors.

Three years after arriving in America, on Dec. 8, 1891, the 27-year-old Steinmetz published his formulation of the law of hysteresis in the journal *The Electrical Engineer*. His method for making cal-

culations concerning alternating current circuits was presented to an uncomprehending audience at the International Electrical Congress in 1893 (and to many uncomprehending undergraduates still today!). His 1897 book *Theory and Calculation of Alternating Current Phenomena* (written with Ernst J. Berg) was so highly mathematical, that few engineers of the time could follow. To educate the electrical engineering profession, he published several new textbooks and expanded his original book into three separate volumes. Gradually, through writing, lecturing, and teaching, his method of calculation was universally adopted.

In 1893 the newly formed General Electric Company purchased Eickemeyer's company, for control of both the patents and Steinmetz. In 1894 Steinmetz was transferred to the main GE plant at Schenectady, New York. His original residence here is still standing at 53 Washington Street.

Union College hired Steinmetz as Professor of Electrical Engineering from 1902–13. Steinmetz taught courses, reorganized and modernized the department, and even joined one of the campus fraternities, Phi Gamma Delta. His interest in education was not limited to the upper levels. Steinmetz served as president of the Schenectady Common Council and also served six years on the Schenectady Board of Education, four of them as its president. He was responsible, among his numerous civil works, for the construc-

tion of eight schools in Schenectady. Under Steinmetz's leadership, the Commission of Parks and City Planning called for a public park system in the City of Schenectady. He also served as president of the American Institute of Electrical Engineers (AIEE), one of the forerunners of the IEEE, in 1901–02.

Charles Steinmetz died of heart failure on Oct. 26, 1923 and at the time of his death, held over 200 patents, including the fundamental patent on a "system of distribution by alternating current." He is buried in Vale Cemetery, Schenectady. The IEEE Board of Directors established the Charles Proteus Steinmetz Award in 1979. It may be presented annually to an individual for major contributions to the development of standards in the field of electrical and electronics engineering. In 1983 the United States Post Office issued a postage stamp in his honor.

This year is the 100<sup>th</sup> anniversary of the IEEE Schenectady Section. One can only imagine how far we have come in the last 100 years, and how much of that would have been impossible without the fundamental research and understanding contributed by Charles Proteus Steinmetz.

—Chandra Reis

## References and further reading

- <http://inventors.about.com/library/inventors/blsteinmetz.htm>
- <http://inventors.about.com/gi/dynamic/offsite.htm?site>
- <http://chem.ch.huji.ac.il/%7Euugeniik/history/steinmetz.html>
- Both Union College and the Schenectady Museum maintain significant archives on Steinmetz, including extensive photographs.



## IEMC 2003: Managing Technologically Driven Organizations: The Human Side of Innovation and Change

The IEEE Schenectady Section is co-sponsoring the IEEE International Engineering Management Conference (IEMC 2003), to be held at the Desmond Hotel in Albany Nov. 1–3. The conference provides a key opportunity to study and assess new directions in technology management and the strategic use of human resources to shape and enhance innovation. It will address all aspects of the human side of managing technology-driven organizations, focusing especially on how to unleash creativity and motivate employees.

For more information, contact Sam Salem at [s.salem@ieee.org](mailto:s.salem@ieee.org) or check the conference website at: [www.mgmt.rpi.edu/ieee](http://www.mgmt.rpi.edu/ieee). You may also check the IEEE Schenectady Section website for updates on conference activities.

# Participate in a PACE Project

PACE, the professional activities committee of engineers, provides the forum for Section members to take part in projects to promote interaction between IEEE and the local community. Possibilities include mentoring to middle school students, contacting legislators on behalf

*The Current Source* is published by the Schenectady Section of the IEEE. Issued twice a year. If you are interested in volunteering for *The Current Source* or wish to submit material for consideration, please contact Sri Pillutla, 783-2088 or [srinivas.pillutla@ieee.org](mailto:srinivas.pillutla@ieee.org)

of IEEE, or starting a consultant's network. Any ideas that enhance the professional well-being of Section members are welcome.

Possible projects include:

- Mentoring middle school students during the National Engineer's Week.
- Mentoring middle school students in a "Design, Build, and Test a Robot Project."
- Contacting your congressman or senator on behalf of IEEE on a pending legislative issue.
- Starting a consultant's network—an informal network of local consultants.

To volunteer for a project, contact Shadrack Orero, PACE Coordinator, [shadrack-orero@hotmail.com](mailto:shadrack-orero@hotmail.com), 395-5068.

—Shadrack Orero

# Nominations and a Call for Volunteers

Nominations for officers for 2004 are as listed below. Please consider volunteering for one of the open positions! If you are interested, contact Rebecca Nold ([rebecca.nold@ps.ge.com](mailto:rebecca.nold@ps.ge.com), 385-3883).

## Executive Committee

Chair—Kristin Short  
VP Treasurer—Ricardo Galarza  
VP Secretary—Sam Salem  
VP Programs—Raj Subbu

## Power Engineering Society Chapter

Chair—Shadrack Orero  
VP Secretary—Basil Youakim  
VP Membership—Jose Daconti  
VP Programs—Saber Azizi

## Computer Chapter

Chair—Howard Halstead

## Industrial Applications Chapter

Chair—Ed Owen

## Microwave Theory and Techniques

Chair—OPEN

## Appointed Positions

Steinmetz Chair—Chandra Reis  
Newsletter Editor—Sri Pillutla  
Awards Chair—Kutty Nair  
Membership Chair—Lou Tomaino  
PACE Chair—Shadrack Orero  
Student Activities Chair—Rebecca Nold

Webmaster/Gatekeeper—Howard Halstead

## Section Historian—OPEN

Section Liaison to Professional Engineering Society—Jose Daconti

## Microwave Theory and Techniques Chair

The Microwave Theory and Techniques Chair must be an MTT Society member and is also an ad hoc member of the Executive Committee. The chair is responsible for planning one or two seminars a year in the technical field and for reporting back to the Section.

## Section Historian

The Section Historian is responsible for preserving and promulgating Schenectady Section history and planning techniques for documenting current events. This is a new position; the volunteer will be able to formulate the plan.



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