



VIRGINIA MOUNTAIN SECTION NEWSLETTER

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Monday, October 17, Clarion Hotel, Roanoke, VA

Fuel Cells for the 21st Century

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Abstract

Continued rapid expansion of the world's population and the desire to maintain existing standards of living in developed countries as well as raise those in developing countries has put and will continue to put tremendous pressures on existing resources and the environment. Energy, both its conversion and use, is essential to this entire process. Thus, an urgent need for evermore efficient, economically viable, and environmentally sound energy conversion systems exists and continues to grow.

Within this context, fuel cell systems are expected to play a major role. This is true for fuel cells as stand-alone systems and even more so as systems working in concert with more conventional energy conversion processes. What is remarkable is the relatively low emissions and comparatively high electrical efficiencies that these devices already exhibit in an early stage of development when compared with those

of the principal energy conversion systems in use today. In fact, the renewed interest and flurry of activity in fuel cell development over the last three decades has come as a result of a number of distinct advantages that these power sources have over others.

In order to put these systems in perspective, a brief history of fuel cells and a description of what a fuel cell is will be given. This will be followed by a discussion of the state of the technology and its applications. Finally, this seminar will conclude with a look at the challenges ahead for introducing this new and exciting technology into the energy economy.

Date: Monday, October 17, 2005
Location: Clarion Hotel, Roanoke
Social: 6:30 PM
Dinner: 7:00 PM
Talk: 8:00 PM
Cost: Member or Guest \$15.00
Student: \$ 8.00
Note change from regular meeting date.

Reserve by 4 PM Wednesday Oct. 12
Dr. James Squire (540) 464-7548
<mailto:squirejc@vmi.edu>

Directions to Clarion Hotel Roanoke Airport

2727 Ferndale Drive NW
1581 Exit 3 Hershberger Rd West
1st Rt. onto Ordway Drive,
¼ mile, Rt. Into Parking Lot.

Speaker Bio

Dr. von Spakovsky has over 17 years of teaching and research experience in academia and over 17 years of industry experience in mechanical engineering, power utility systems, aerospace engineering and software engineering. He received his B.S. in Aerospace Engineering in 1974 from Auburn University and his M.S and Ph.D. in Mechanical Engineering in 1980 and 1986, respectively, from the Georgia Institute of Technology. While at Auburn he worked for 3-1/2 years at NASA in Huntsville, Alabama and

during 1974-84 and 1987-89 he worked in the power utility industry first as an engineer and then as a consultant. From 1989-96 Dr. von Spakovsky was at the Swiss Federal Institute of Technology in Lausanne Switzerland where he lead a research team in the modeling and systems integration of complex energy systems and taught classes in the thermodynamics of indirect and direct energy conversion systems (including fuel cells).

Dr. von Spakovsky joined Virginia Tech in January 1997 as Professor and Director of the Energy Management Institute (now the Center for Energy Systems Research). He currently teaches undergraduate and graduate courses in thermodynamics, industrial energy systems, fuel cell systems, and energy system design. His research interests include computational methods for modeling and optimizing complex energy systems, methodological approaches for the integrated synthesis, design, operation and diagnosis of such systems (stationary power as well as, for example, high performance aircraft systems), theoretical irreversible and equilibrium thermodynamics with a focus on the unified quantum theory of mechanics and thermodynamics, and fuel cell applications for both transportation and distributed power generation. He has published widely in scholarly journals, conference proceedings, etc. (over 140 publications) and has given talks, seminars and short courses (e.g., on fuel cells) worldwide. Included among his various professional activities and awards is membership in the AIAA, *Fellow of the ASME*, ASME representative to the U.S. CADDET National Team, member of the *Executive Committee* for the ASME's Advanced Energy Systems Division, elected member of Sigma Xi and Tau Beta Pi, Associate Editor of the *International Journal of Fuel Cell Science and Technology*, Editor-in-Chief of the *International Journal of Thermodynamics*, and Chairman of the *Executive Committee* for the *International Center of Applied Thermodynamics*.

Senior Members

Congratulations to Cameron Patterson who was elevated to Senior Member at the last Senior Member Review Panel meeting that was held on 24 September 2005. The next panel meeting, and the last one for the year, is going to be held on 12 November 2005 in Orlando, FL. The deadline for submitting SM applications for this meeting and for participating in the 2005 Nominate a Senior Member Initiative is 4 November 2005. These review sessions will resume again in 2006.

Student Members

Next summer, the IEEE will sponsor three outstanding student members to participate in the 2006 Washington Internships for Students of Engineering (WISE) Program. The select candidates will spend nine weeks in Washington, D.C., learning how engineers contribute to the legislative decision-making process. The application deadline is 16 December 2005. For more information, visit <http://www.wise-intern.org>, or contact Sharon Richardson at s.richardson@ieee.org.

Membership Renewal

The IEEE encourages its members to renew electronically. More than 198 000 members renewed online for 2005, a 9 percent increase over 2004. (Students are required to renew or join IEEE online; their renewal notice will be sent to the e-mail address on file with the IEEE.) Those who renew online by 15 November at <http://www.ieee.org/renew> will be entered in a drawing to win a Dell Inspiron laptop.

Chapter Activities

VMS is considering forming a joint Chapter of the Laser & Electro-Optics Society (LEOS) and Engineering in Medicine & Biology Society (EMBS). We are particularly interested in bringing together academics and health industry engineers and scientists working in this area. Anyone interested in helping with the formation of this Chapter should contact Prof. Kathleen Meehan k.meehan@ieee.org

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