MITei

MIT Energy Initiative
Seminar Series, Fall '09 – Spring '10

# Materials Challenges in Polymer Electrolyte Fuel Cells

Frank DiSalvo

**Frank DiSalvo**
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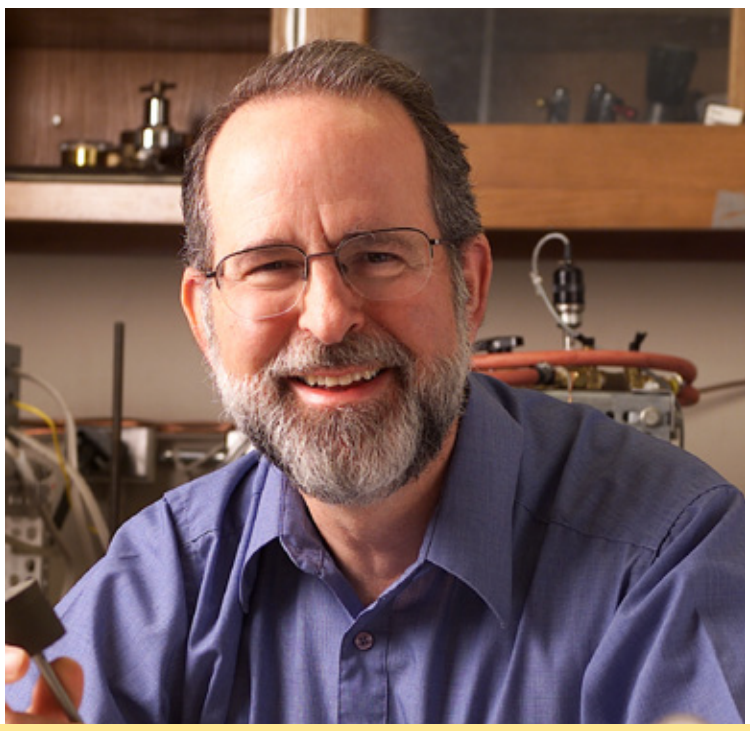
**The John A. Newman Professor of Physical Science at Cornell, Frank DiSalvo is the co-director of the Center for Future Energy Systems and the Cornell Fuel Cell Institute, as well as a member of the National Academy of Sciences and a fellow of the American Physical Society and Materials Research Society. He serves on the Department of Energy's Basic Energy Science Advisory Committee and has authored or co-authored more than 450 professional papers.**

**DiSalvo received his B.S. in physics from the Massachusetts Institute of Technology in 1966 and his Ph.D. in applied physics from Stanford University in 1971, following which he joined the research staff at AT&T Bell Laboratories (now Lucent Technologies), where he later headed several research departments. He joined Cornell's chemistry department (now the Department of Chemistry and Chemical Biology) in 1986.**



## Tuesday, April 6 2010

## Lecture: 4:15 PM
## Room 66-110, Landau Building
## Reception to follow

## Massachusetts Institute of Technology
## 25 Ames Street
## Cambridge, Massachusetts

**Abstract**

**Fuel cells are the only technology that theoretically can convert chemical energy to electrical energy at nearly 100% efficiency. This compares to about 35% efficient for the average power plant and perhaps 25–30 % for transportation vehicles.**

**Yet many barriers remain to realizing the full promise of fuel cell technology, especially for automotive applications. The main barrier is that the materials used in the heart of the fuel cell (the electrodes and membranes) are not up to the job. They are too expensive and have poor durability. Finally relatively few fuels can be directly used in the cells.**

**This presentation will focus on the challenge to find better electrode catalysts and catalyst supports. Catalysts are easily poisoned and/or have low activity. If nearly ideal catalysts can be found, then fuel cell technology has a much better chance to transform the way we use energy and to greatly increase the efficiency of the process. Current catalyst supports are based on carbon blacks, but corrode too rapidly.**

**In this seminar, we will discuss the research at the Energy Materials Center at Cornell ($EMC^2$) that is directed at addressing the above challenges.**

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