# Carnegie Mellon
## Materials Science and Engineering Seminar Series

### James W. Evans

University of California, Berkeley

*"The Making of Aluminum and What We Can Do About It."*

**Friday, April 30, 2010**
**11:30 A.M. Seminar in Scaife Hall 125**

The production of aluminum is responsible for electrical energy consumption that exceeds that of Germany. If we include emissions from power plants providing the electricity, aluminum production is responsible for greenhouse gas emissions exceeding all emissions from France. And yet the electrolytic production of aluminum is a technology that would be recognizable to its inventors from the 19th century; its improvements in over a century have been evolutionary, rather than revolutionary. The presentation provides an overview of aluminum production and discusses possibilities for a radical improvement of the technology. Materials play a significant role in the implementation of any such improvement.

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**James W. Evans**
**P. Malozemoff Professor Emeritus**

Faculty member since 1972. Emeritus from June, 2007.
32 Ph.D.s and about 30 M.S.s graduated (includes one faculty member at U. of Michigan, two at IIT, Kanpur, one at National Taiwan University, one at City University of NY)

Awards last decade:
Light Metals Technical Service Award of TMS, 2001
Extraction and Processing Science Award of TMS, 2002
Aluminum Distinguished Service Award of TMS, 2002
P. Malozemoff Endowed Chair in Mineral Engineering, 2003-
James Douglas Gold Medal of AIME (for "distinguished achievement in nonferrous metallurgy"), 2004
The Brimacombe Prize (awarded for "…a single or sustained contribution to materials process engineering deemed outstanding."), 2004
The Berkeley Citation (Berkeley's equivalent of an honorary degree), 2008

Approx. 200 publications in refereed archival journals, three books, four edited books, nine patents, 150 other written publications.

Current research interests:

1. Printing of batteries and capacitors for energy storage at the scale of 10 microns to millimeters for energy storage in wireless devices.
2. Failure of underground power distribution cables, particularly modeling of the electromagnetic stress and fatigue of cables.