Purdue University

School of Chemical Engineering
GRADUATE SEMINAR SERIES

Peter G. Winchell Distinguished Lecture Series
Co-sponsored with School of Materials Engineering

Dr. Steven J. Visco, CEO

PolyPlus Battery Company, Berkeley, California

"The Road to Next Generation Battery Technology: Challenges and Opportunities"

November 27, 2012
9:00-10:15 a.m.
FRNY G140
Reception at 8:30 a.m. in Henson Atrium

Abstract: Over the past several decades the United States has lagged significantly behind Japan, Korea, and China in the development and commercialization of advanced electrochemical energy storage technologies. As the world moves towards electrification of transportation and increased use of renewables for grid power, the demand for advanced secondary batteries has already fueled a global race for manufacturing of these key technologies. In order to maintain a competitive position, the U.S. will need to innovate, both in the development of step-change energy storage technologies and in cost-competitive manufacturing of those products. Given the limited introduction of hybrid and fully electric automobiles (xEVs) in the U.S. and abroad, it is clear that widespread adoption of xEVs will not take place until higher performance and lower cost battery technologies are available at scale. Panasonic in Japan recently announced its introduction of a higher performance Li-ion battery incorporating lithium-silicon anode technology, and it is clear that other manufacturers are pursuing similar strategies leading ultimately to lithium metal technology. PolyPlus invented and patented a new generation of water-stable protected lithium metal electrodes, and has advanced the technology under a U.S. DOE ARPA-e program with Corning Incorporated and a recently announced DOE Innovative Manufacturing program with Corning and Johnson Controls. These anodes are enabling for lithium-air, lithium-water, and lithium-sulfur batteries, as well as secondary batteries employing metal oxide cathodes. Accordingly, this presentation will cover some of the relevant challenges and opportunities for scientists looking to make an impact in this exciting field.

Bio: Steven Visco is the Chief Executive Officer, CTO, and co-founder of PolyPlus Battery Company in Berkeley, California, as well as a Guest Scientist in the Materials Science Division at the Lawrence Berkeley National Laboratory. Dr. Visco received his Ph.D. in Physical Chemistry from Brown University in 1982 and spent two years as a Postdoctoral Scientist at the University of California at Santa Barbara working on advanced batteries. Dr. Visco then joined the staff at the Lawrence Berkeley National Laboratory as a Principal Investigator in the Materials Sciences Division in 1984 where his research interests have included solid-state ionic devices such as batteries and fuel cells. Steven Visco co-founded PolyPlus Battery Company in 1991. Dr. Visco also serves on the Technical Advisory Boards for the Conrad Foundation and the CIC Energigune Institute in Miñano, Spain. Dr. Visco has published over 75 articles in scholarly journals and books, and currently holds 94 issued U.S. patents and more than 200 international patents. In 2011 Dr. Visco was awarded the International Battery Association Technology Award for "*Outstanding Contributions to the Development of Lithium-Air and Lithium-Water Batteries*." PolyPlus was recently selected by TIME magazine for its 50 Best Inventions of 2011, and received an Edison Gold Award in April 2012.