SOUTH DAKOTA MINES
Department of Mechanical Engineering

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THURSDAY, SEPTEMBER 3 2:00-2:50 PM

ME Research Seminar

Beyond Li-ion: Lithium-Sulfur Battery Research

DR. WEIBING XING
SOUTH DAKOTA MINES

Dr. Xing recently joined the Department of Mechanical Engineering, South Dakota Mines as a Pearson Chair Associate Professor. Prior to SD Mines, he was a Research Fellow at ADA Technologies, Inc. Littleton, CO, for 9 years. Dr. Xing has led 10+ federal funded energy storage programs (a total of ~$7M research funding) as a principle investigator for materials research, device integration and product development. Before ADA, Dr. Xing was a senior scientist at Greatbatch in Clarence, NY, for 8 years, where he developed advanced battery materials for medical applications. Prior to Greatbatch, Dr. Xing was a senior scientist at Electrochem in Raynham, MA, for 5 years, where he developed polymer Li-ion batteries for commercial applications. Prior to industry, Dr. Xing was a postdoctoral research fellow at Simon Fraser University and Dalhousie University in Prof. Jeff Dahn's group, where he developed high energy density materials for Li-ion batteries and a phenomenological model correlating materials' physical properties with electrochemical performance. Dr. Xing has >40 scientific journal publications, >30 granted/pending patents and >30 presentations at scientific/technical conferences. Dr. Xing is a long-time member of The Electrochemical Society. Dr. Xing received his PhD 1995, MS 1990 in Applied Physics, Simon Fraser University, and BS 1982 in Physics, Ningxia University.

I will first briefly introduce batteries, achievement made for Li-ion batteries in the last 30 years which culminated in the 2019 Nobel Prize in Chemistry for Li-ion batteries. I will then introduce the advantages and technical challenges of Li-S batteries. I will present our efforts in the development of a high energy density, long cycle life, safe and economically scalable Li-S battery technology via a holistic approach to nanoengineer/ functionalize cell components including active components (i.e., S cathode, Li metal anode) and inactive components (e.g., separator, electrolyte), to address the Li-S battery cycle life degradation challenges and safety concerns. I will show that our comprehensive approaches afforded high discharge specific capacity, Coulombic efficiency and stable cycle life of the resultant Li-S cells.

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in-person: CM 266 (capacity 16)
Live *Zoom!* LINK: tiny.cc/MinesF20