

# UNDERWRITERS LABORATORIES®

## Battery Safety Science Symposium

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### Session III

#### Empirical and Modeling Studies: New Insights

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### *Ceramic Separators and Ceramic Electrolytes for Safer Li-ion Batteries*

Commercial lithium-ion (Li-ion) batteries rely on the use of organic electrolytes and polymer-based separators in their constructions. However, low thermal stabilities of these may induce various safety hazards. Organic electrolytes commonly suffer from high flammability in combination with high vapor pressure at relatively moderate temperatures of 150-400 C. Polymer separators tend to shrink and lose mechanical properties when heated to over 100-150 C. This talk will cover alternative solutions, where drop-in replacement ceramic electrolytes and porous ceramic separators are introduced. Such novel technologies may compete in price and cell-level specific energy with conventional products, while offering significantly better safety and, in many cases, higher energy density and higher rate performance.

### About the speaker

Dr. Gleb Yushin is a Professor of Materials Science at Georgia Institute of Technology and an Editor-in-Chief for Materials



Today, the flagship journal of the Materials Today family dedicated to covering the most innovative, cutting edge and influential work of broad interest to the materials science community. Prof. Gleb Yushin is also a Co-Founder and the Chief Technology Officer (CTO) of Sila Nanotechnologies, developer and manufacturer of advanced materials that change the landscape of what is possible to achieve with Li-ion batteries. Gleb has co-authored over 160 peer-reviewed publications and over 120 US and international patent applications. Prof. Yushin is a Fellow of the Materials Research Society (MRS), a Fellow of the Electrochemical Society (ECS), and a Fellow of the National Academy of Inventors (NAI). Prof. Yushin holds BS and MS degrees in Physics from Polytechnic Institute and a PhD in Materials Science from North Carolina State University.