

Spring 2023 Joint Colloquium

Materials Department & Materials Research Laboratory

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Georgia Institute of Technology
School of Materials Science
and Engineering

Friday, May 26, 2023
11:00 am | ESB 1001



Next Generation Material Technologies for Future Li-ion Batteries

Advancements in the capabilities of lithium-ion batteries have slowed down in the last decade. As conventional electrode materials approach their theoretical limits, substantial gains in battery energy density only come as a trade-off in safety or performance. This talk will discuss how replacing conventional active and inactive materials will significantly improve performance, drastically reduce the cost of Li-ion batteries, and pave the way for renewable energy technologies. For example, Sila's innovative drop-in-replacement nanocomposite, silicon-based anode powder offers over five times higher gravimetric capacity than graphite, permits both fast charging and over 20% more energy density today over state-of-the-art lithium-ion, and enables radical product innovation - all without compromising performance. Most importantly, this material has been shipping in devices for nearly two years and is scaling up for massive electric vehicle (EV) use by mid-decade. With Sila's industrialized and scaled scientific innovation, wearables, portable electronics, and EV manufacturers can create breakthrough products today that will minimize our environmental impact tomorrow. This talk will also provide multiple examples of lightweight conversion-type cathodes, flexible ceramic separators, and other technologies that may become instrumental for the transition to a clean and energy-sustainable economy.

Bio

Gleb Yushin is a Professor of Materials Science at Georgia Institute of Technology, an Editor-in-Chief for Materials Today and Co-Founder & CTO of Sila Nanotechnologies (<https://www.silanano.com/>). Gleb has co-authored over 180 peer-reviewed publications, and over 210 patents and patent applications. For his contributions to the development of energy storage materials Gleb has received numerous awards and was elected to be a Fellow of multiple organizations: the International Society of Electrochemistry (ISE), the Materials Research Society (MRS), the Electrochemical Society (ECS), the EU Academy of Sciences, and the National Academy of Inventors (NAI). Gleb was also recognized as one of the world's most influential scientific minds. Gleb holds BS and MS degrees in Physics from Polytechnic Institute and a PhD in Materials Science from North Carolina State University (NCSU).

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Hosted by Raphaële Clément.