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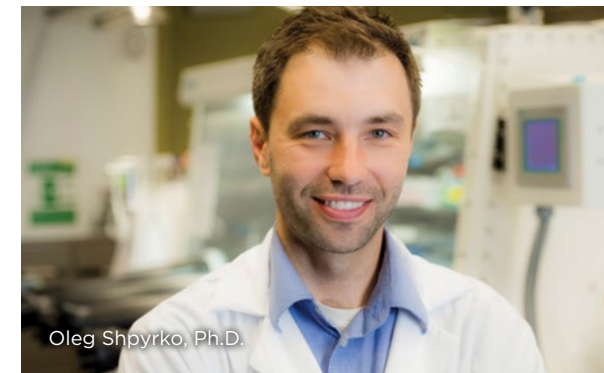
UC San Diego

8th Best Public University
in the Nation

U.S. News & World Report



Shirley Meng, Ph.D.



Oleg Shpyrko, Ph.D.

A Battery of Solutions

In a low-carbon future, if electric vehicles are to compete in the automotive market, they will need to have both the performance and range that high-voltage batteries provide.

Collaborating to meet the challenge are two UC San Diego researchers—nanoengineer **Shirley Meng, Ph.D.**, and physicist **Oleg Shpyrko, Ph.D.** Their work in the new Sustainable Power and Energy Center combines Meng's expertise in battery research with Shpyrko's X-ray imaging techniques to provide insights—at the nanoscale—on what happens inside a battery while it operates in real time. Ultimately, their findings will shape how battery developers design high-voltage lithium-ion batteries to reduce greenhouse emissions and the carbon footprint of vehicle transportation.

The work at the center is closely aligned with sustainable operations on campus. UC San Diego's microgrid—which generates 92 percent of the energy used by the university annually, and is considered one of the most advanced in the world—serves as the test bed for the researchers to fine-tune their green and advanced energy solutions.

Batteries in the lab are charged and discharged at different current densities and cut-off voltages—to be evaluated on energy density and cycling efficiency. The information gained is critical for scientists in correlating the structures of the materials with the electrochemical performance of the batteries.

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