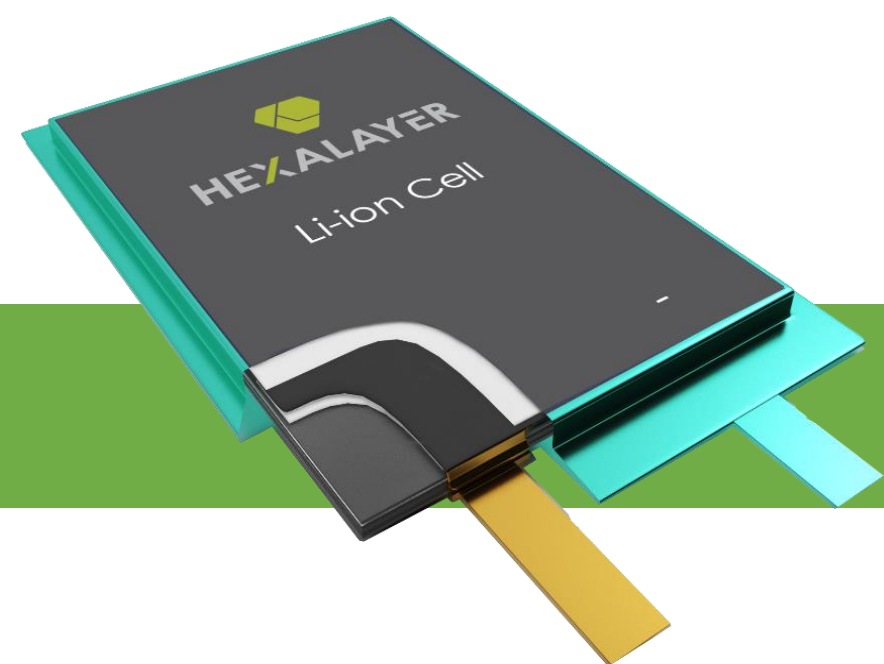


## Layered Graphene Anode for High Energy Density Li-ion Batteries

Tereza M. Paronyan

INNOVATION & SUSTAINABILITY

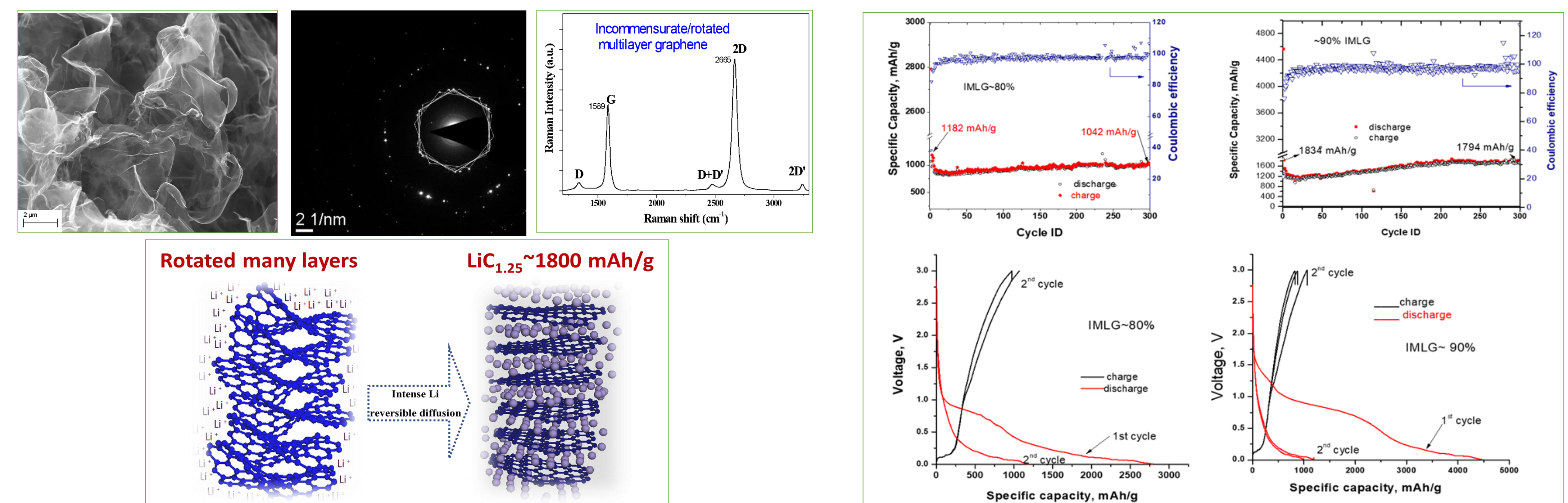


Various recent innovations in the Li-ion battery technology manufacturing and performance have allowed its adaptation as a primary solution for large scale electric transportation, device, and grid storage solutions.

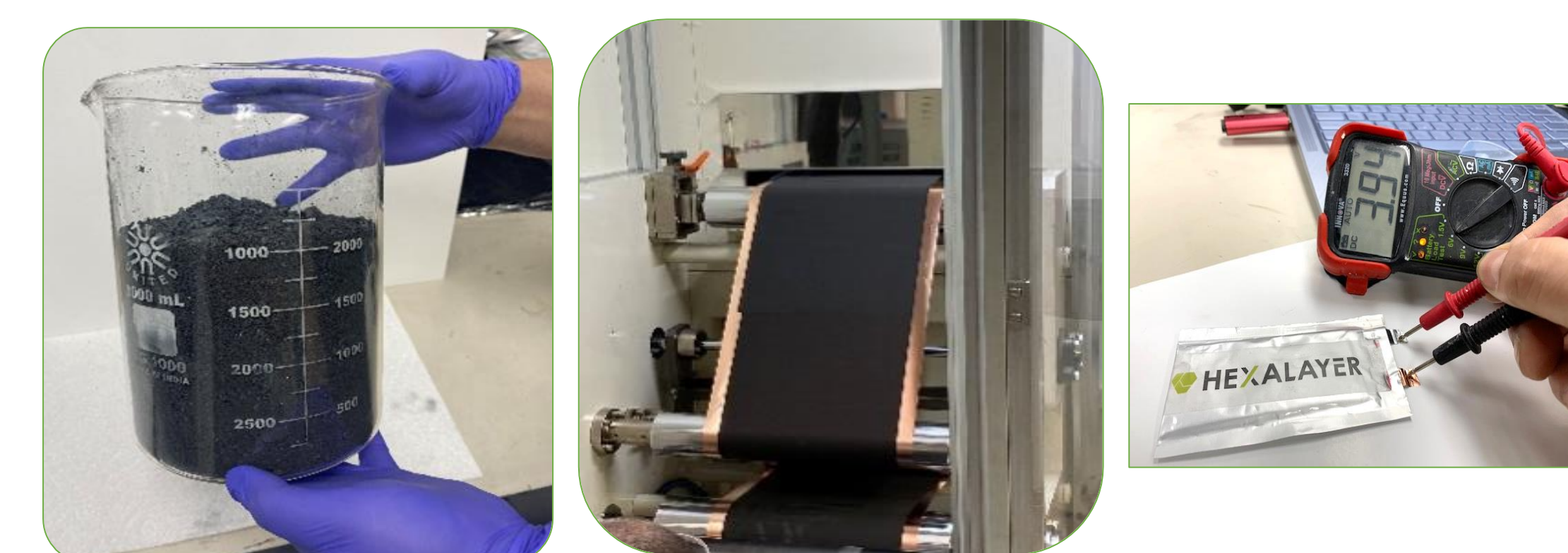
Despite this, Energy Density (W.h/kg) remains a key obstacle in addressing the heavy-duty ground transportation and aviation sectors. A transition to sustainable electric ecosystem will require a class of high capacity, lightweight Li-ion battery cells with innovative materials.

HeXalayer's focus is the development of next-generation high-power lightweight rechargeable batteries based on an innovative, graphenic anode technology. This layered graphene, named as an Incommensurate Multilayer Graphene (IMLG) performs up to **1,800 mA.h/g** specific capacity as an anode material in LiB by significantly defeating the limited capacity (372 mA.h/g) of carbon-based materials in LIBs.

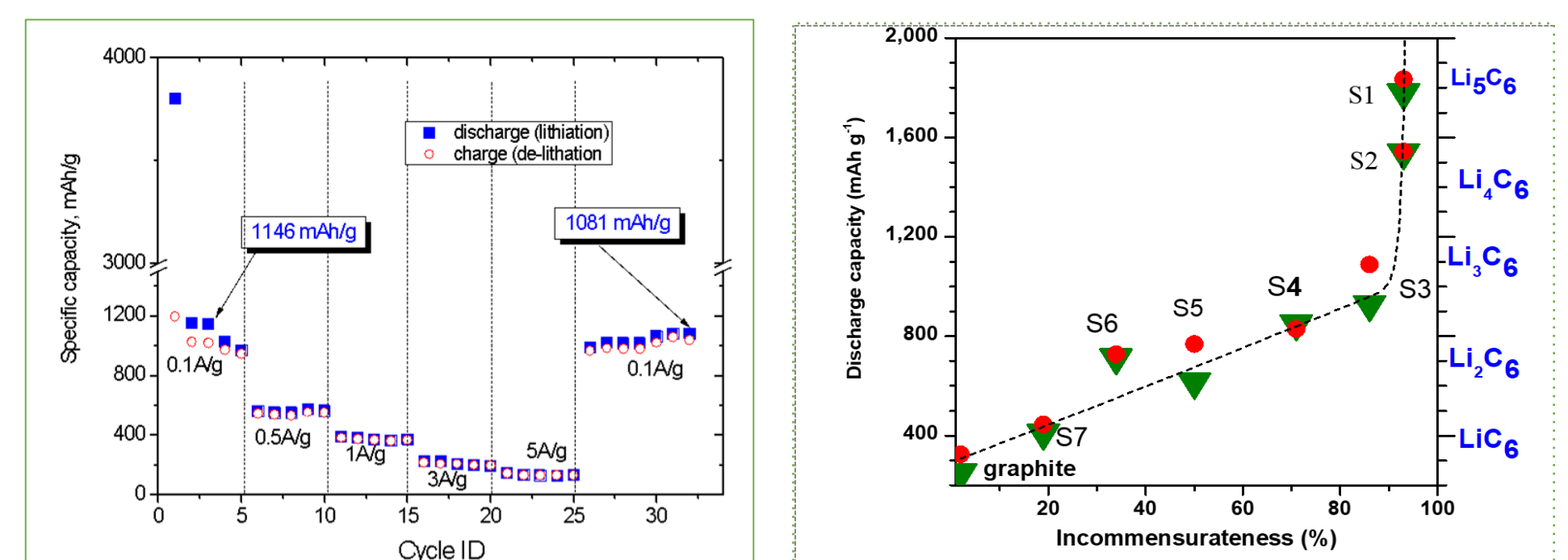
HeXalayer's technology offers a significant increase (up to 200%) improvement in the energy density of Li-in Batteries(LiB) by replacing commonly used graphite anode with innovative layered graphene anode.



The interlayer rotation provides easy access for Lithium ions intercalation  
Higher incommensurateness provides higher capacity of Li-ion battery.



Graphene anode -based LiB pouch cells manufacturing



Stable cycling with high charge/discharge efficiency

### R&D Partners/Sponsors



SBIR Phase  
1&2



Cabinet for Economic Development



#### Related Publications

- T. Paronyan et al. *NATURE*, SR 7, (2017).
- T. Paronyan et al. *ECST* 77, 311 (2017).
- T. M. Paronyan "in *Dekker Encyclopedia of Nanoscience and Nanotechnology*- DOI: 10.1081/E-ENN3, 2018.
- T.M. Paronyan, *JMR* 36, 2872–2880 (2021).