**High-energy-density batteries**

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Silicon (Si) and lithium (Li) metal anodes are considered key materials for next-generation high-energy-density batteries due to their exceptional theoretical capacities. However, challenges such as the volumetric expansion of Si and the dendritic growth of Li-metal hinder their practical applications. Recent advances in material engineering, electrolyte optimization, and interfacial stabilization have demonstrated promising strategies to overcome these limitations. This presentation will highlight recent developments in Si and Li-metal anodes, focusing on performance improvement and long-term stability.

On-going Joint PhD program between the University of Wollongong and Sungkyunkwan University will be introduced, fostering international collaboration in advanced battery research.