



Giovedì 11 Aprile 2024, ore 10  
aula L2 del DiSC

**il Dr. Dong Jun Kim**

School of Chemistry,  
University of New South Wales,  
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terrà il seminario dal titolo:

***From Anode-Free Batteries  
to All Solid-State Batteries***

**Abstract:** My research encompasses the synthesis and analysis of materials used in rechargeable batteries, bridging the disciplines of synthetic chemistry, electrochemistry, and materials science. The presentation will begin with an exploration of recent developments in the molecular and cell design of anode-free lithium metal batteries, emphasizing the enhancement of electrode-electrolyte stability for extended performance. With in-situ optical microscopy, we have obtained robust evidence that these coatings ensure consistent lithium layering on the current collector, which withstands cycling processes. In the second part of my presentation, I will share approaches to enhance the performance and robustness of all-solid-state batteries, particularly sulfide-based Li-argyrodite  $\text{Li}_6\text{PS}_5\text{X}$  ( $\text{X} = \text{Cl}, \text{Br}$ ) compounds. The aliovalent doping of phosphorus has resulted in new compositions with increased ionic conductance and alleviated chemical instability issues compared to the unmodified material. Moreover, by incorporating graphene fluoride into the cathode composite, we have significantly enhanced the chemical stability of the electrolyte interface.

**Brief CV:** Dr. Dong Jun (DJ) Kim, a Senior Lecturer and DECRA Fellow at the School of Chemistry, UNSW Sydney, leads a research group in the development of supramolecular materials for rechargeable batteries and artificial molecular machines. He laid his academic foundations at Yonsei University (B.S., 2010) and KAIST (Ph.D. in Materials Science Engineering, 2015). Then, he moved to Northwestern University as a postdoctoral researcher, where he worked under the guidance of Sir Prof Fraser Stoddart. Since October 2018, he has started his independent career at UNSW Sydney, focusing on the synthesis of supramolecular compounds for energy storage applications.

**Dott. Cristian Pezzato**

**Il Direttore del Dipartimento  
Prof. Stefano Mammi**