



**Seminar Topic:  
Structural Batteries- A Multifunctional Strategy for Electrification**

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**Abstract**

Electrification could provide many benefits towards the environment like lessening the dependence on non-renewable resources and reducing emissions when applied in the space of transportation. However, their battery packs take up a significant amount of space, decreasing the cargo capacity of EVs and payload of electric planes. Therefore, electrification of transportation options is driven largely by the advancement of battery technology and light-weighting composites with the goal of achieving a higher energy while reducing weight and saving space.

To that end, the concept of providing structural power in the form of multifunctional structural power devices has been deemed as a potentially viable strategy to achieve both high energy density, light-weighting, and space savings simultaneously. However, the scientific problems facing the development of multifunctional materials for structural power devices are especially hard to solve due to the seemingly incongruent material requirements for energy storage and structural stability.

In this talk, I will be taking you through the various strategies my group are employing to overcome the challenges of multifunctionality in the various constituent materials to achieve overall systemic efficiencies in energy storage and structural stability.

**Biography**

Dr Derrick Fam obtained his Bachelor of Engineering and Doctorate from the School of Materials Science and Engineering (MSE), NTU, in 2006 and 2012, respectively. After a two-year stint as a Research Fellow with MSE in the CREATE-HUJI-NTU programme, he was awarded the A\*STAR International Fellowship (A\*IF) and did his postdoctoral research in Imperial College London in 2014, working on structural supercapacitors. In 2016, he returned to Singapore and assumed the role of a Scientist in the Institute of Materials Research and Engineering, A\*STAR. He is currently serving as the Programme Director for the Structural Power for portable and electrified transportation (AME programme) that is focused on developing structural batteries for various applications.

**Wednesday, 19 January 2022 || Time: 2:00 pm – 3:00 pm ||**  
**Live Streaming Link (Zoom Meeting): <https://ntu-sq.zoom.us/j/97720354960>**  
**Meeting ID: 977 2035 4960 Passcode: 190122**  
**Hosted by: Associate Professor Alfred Tok ling Yoong**