



Seminar Topic:

Local microstructure designs to tailor the properties of platelet-reinforced composites.

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Abstract

Platelet-reinforced composites with nacre-like microstructure (horizontally aligned platelets) are known to enhance properties in composites. In this talk, I will present composites with more complex microstructures and explain how the microstructural designs can be appropriately leveraged to enhance the performance of materials and devices. First, I will show PDMS-alumina composites and how multilayer platelet arrangements are useful to combine strength, stiffness and toughness when tested under compression. Second, I will show BN composites and how the microstructure can create thermal interface materials with high thermal conductivity. Examples showing how the microstructure control can also direct the heat transfer will also be given. Finally, I will present a drop-on-demand 3D printing strategy that can create multimaterial microstructured materials and show how this method can make functional devices with augmented performance, such as capacitors and pressure sensors.

Biography

Dr Le Ferrand is Nanyang Assistant Professor at NTU since 2019. She graduated in Physical chemistry from ESPCI Paris, France in 2012 and in Materials from ETH Zurich, Switzerland in 2013 (MSc) and 2017 (PhD). Following postdoctoral positions on bioinspired materials at Purdue, USA and NTU, she got awarded several prizes, notably the NRF fellowship to further develop 3D printing of bioinspired advanced materials. Her research interests include additive manufacturing of composites and ceramics, strong and tough ceramics, multifunctional advanced materials, and bioinspired sustainable composites. Dr Le Ferrand's research is published in top journals including Nature Materials, Advanced Materials, Nature Communications, PNAS, etc.

<https://scholar.google.com/citations?user=UoqLHJgAAAAJ&hl=en>

Wednesday, 14 September 2022 || Time: 2:00 pm - 3:00 pm ||

Venue: MSE Meeting Room (N4.1-01-28)

Please register [here](#).

Hosted by: Professor Ali Miserez