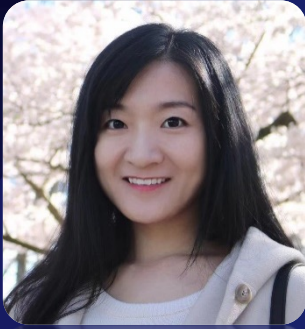


# THIN FILMS SOCIETY

## WEBINAR SERIES #13



### Improved Mechanical Properties of High-Entropy Alloy Coatings via Metastability Engineering

28 December 2023 14:00 (GMT+08:00)

**Speaker: Dr. Yujie Chen**

ARC DECRA Fellow & Lecturer  
School of Electrical & Mechanical Engineering,  
The University of Adelaide, Australia

[Join Tencent Meeting here](#)

Meeting ID: 967-067-007

Passcode: 889663

#### Abstract

The improvement in hardness is usually accompanied by toughness loss in coatings. Here, the metastability-engineering strategy is applied to high-entropy alloy (HEA) coatings to overcome the hardness-toughness trade-off. Specifically, we aim at 1) producing metastable solid solution phases that are highly supersaturated with nitrogen to introduce massive interstitial solid solution strengthening; 2) tailoring the stability of the constituent phases to promote the formation of a dual-phase microstructure; 3) compositional and microstructure tuning of metastable phases to trigger transformation-/twinning-induced plasticity (TRIP/TWIP) effect. A unique combination of various strengthening and toughening mechanisms equip HEA coatings with substantial gain in hardness, toughness, and damage tolerance.

#### Dr. Yujie Chen

- ✓ Received her Ph.D. degree in Materials Science in 2016 from the University of Sydney, Australia.
- ✓ From 2019 to 2021, she worked as a Postdoctoral Fellow in Prof. Sam Zhang's group in Southwest University in China.
- ✓ She is currently an Australian Research Council (ARC) DECRA Fellow and Lecturer in the School of Electrical & Mechanical Engineering at the University of Adelaide in Australia.
- ✓ Her research mainly focuses on the development of strong yet tough engineering materials, particularly coatings and alloys, and understanding the relationship between their structures and properties using advanced electron microscopy techniques.
- ✓ She has published 33 peer reviewed papers in high-quality journals, including *Acta Mater.*, *Nano Lett.*, *Appl. Phys. Rev.*, *ACS Nano*, *Small*, *JMST*, etc., and 2 book chapters.
- ✓ Received Elsevier Early Career Award and CSC Chinese Government Award for Outstanding Self-financed Students Abroad.

Introducing Thin Films Society Conference Series:

# THINFILMS2024

Summer 2024  
@ Singapore!



More information to come!

[www.thinfilms.sg](http://www.thinfilms.sg)