Research Seminar

NUS National University of Singapore

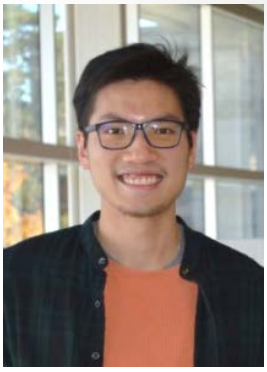
Department of Chemistry
Faculty of Science

Soft Approaches in Polymeric Materials Fabrication

by Dr Boyce Chang
University of California Berkeley, USA

Host: A/P Christian Nijhuis | Thu, 20 June 2019 11:00 – 12:30 S8-03-14 Executive Classroom

About Dr Boyce Chang



Dr Boyce Chang is a postdoctoral fellow at the University of California Berkeley. Originating from Kuala Lumpur, Malaysia, he travelled to Iowa State University and completed his PhD in Materials Science and Engineering (2018), which shaped his research interest on non-traditional fabrication of polymeric materials. In addition to the Graduate Research award, he was granted research fellowships from the French National Center for Scientific Research (CNRS) and the Critical Materials Institute at Ames Laboratory. He contributed to more than 20 publications including peer reviewed articles, patents and conference presentations.

Abstract

Polymeric materials play a central role in cutting edge technologies such as biomedical devices, organic semiconductors and catalysis. Their growing demands, however, necessitate diversity in our fabrication library. Specifically, soft approaches are desired when considering incentives for scale up and the inherent vulnerability of polymers.

Here, we explore unconventional approaches across different classes of polymeric materials. 1) Application of solvated free electrons for end group-free, room temperature rapid polymerization. These subatomic initiators trigger a bi-mechanistic reaction that opens the pathway to complex block-polymer architectures. 2) Metal particles as precursors to coordination polymers where nanomaterials can be realized at ambient temperature and pressure in a quantitative reaction. 3) Mechanically responsive composites fabricated with kinetically trapped metastable undercooled particles. 4) Multiscale hierarchical nanocomposites using supramolecular assemblies whereby facile control over periodicity is established by secondary interacting small molecules.

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