Department of Mechanical Engineering
The University of Hong Kong

Department of Mechanical Engineering
The University of Hong Kong

Tam Wing Fan Inno Wing Two
FACULTY OF ENGINEERING

SEMINAR

Additive Manufacture of Metals with Complex Microstructure

Date: 1 August, 2024 (Thursday)
Time: 4:30 pm – 5:30 pm
Venue: Tam Wing Fan Innovation Wing Two
G/F, Run Run Shaw Building, HKU

Speaker: Professor Matteo Seita
Granta Design Assistant Professor
Department of Engineering
University of Cambridge

Moderator: Professor David Srolovitz
Dean of Engineering
The University of Hong Kong

Abstract:

One of the main drivers for the adoption of additive manufacturing (AM) in industry is the ability to build parts with complex—and previously unattainable—geometries. This paradigm has enabled the production of high-performance components with optimized strength-to-weight ratio, or with internal features for enhanced functionality. The disruptive potential of AM, however, goes beyond complexity of shape. Because materials are formed at the microscopic scale following a bottom-up manufacturing approach, AM offers the opportunity to make parts with complex—and previously unattainable—microstructures. Since the relationships between these complex microstructures and the resulting materials properties are difficult to unveil, this unique feature has yet to be capitalized on in current industrial applications. However, it may hold the key to designing the materials of tomorrow. In this talk, Professor Seita will present a few examples of the microstructure complexity offered by AM which revolve around novel metallurgical strategies to control crystallographic textures, phases, and defects.

Biography:

Professor Seita is the Granta Design Assistant Professor in the Department of Engineering at the University of Cambridge, where he leads the Additive Microstructure Engineering Laboratory (AddME Lab). The goal of the AddME Lab is to understand and control the microstructure complexity imparted by the additive process to design metallic materials with improved performance and novel functionalities. Before joining the University of Cambridge, Professor Seita was a Nanyang Assistant Professor at NTU Singapore. During his tenure at NTU, he was awarded the prestigious NRF Fellowship—a S$3M individual grant for early-career scientists—to develop novel additive manufacturing strategies for microstructure control of metal alloys. In recognition of this work, in 2023 Professor Seita received the TMS Young Innovator in the Materials Science of Additive Manufacturing Award from the Minerals, Metals & Materials Society. He earned his Ph.D. in Materials Science from ETH Zurich in 2012 and then spent three years as a Postdoctoral Associate in the Department of Materials Science and Engineering at MIT. Professor Seita is the author of over 50 publications and the co-founder and technical lead of the venture XtaLight, which provides simpler, faster, and more affordable microstructure analysis for quality control of metal parts.

ALL INTERESTED ARE WELCOME