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### **From Biominerals to Ancient Technologies: Exploring New Routes for Durable Building Materials.**

Inspired by the remarkable structural complexity of biological materials and their benign conditions for synthesis, Nature can offer tremendous insights into design and processing strategies for the synthesis of complex, damage tolerant, and hierarchically ordered composites. Similarly to Nature, ancient processing technologies delivered extremely durable and environmentally resistant construction materials, many examples of which have persisted in excellent condition for more than 2000 years. In order to unlock the design secrets of both biological and ancient materials, we have to understand the intrinsic material properties at all levels of their structural hierarchy, their intricate structure-chemistry-function relationships, and the consequences associated with their interactions with the external environment. In this talk, I will present an overview of my research on advanced multiscale material characterization approaches to study in situ hierarchical structures and transformations of relevant biological and ancient materials. By integrating the state-of-the-art characterization and modeling tools, a novel roadmap for durable and sustainable building materials of our future will be outlined.

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Ryan 4003  
11am**

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