



Distinguished Seminar

Microstructural Design of Ceramic-Polymer Composites for Demanding End-Use Applications



Dr. Randall Erb Northeastern University

Lightweight bio-composites including nacre, bone, and bamboo exhibit remarkable strength and toughness due, in part, to their elegant ceramic microstructure. We are investigating routes for applying these natural design principles to manufactured composites by applying physical forces to the microstructure during

synthesis. We have successfully developed a magnetic doping process in ceramics to be able to recreate elegant architectures in synthetic ceramic-polymer composites. These break-throughs have enabled two companies to spin-out of our Northeastern lab: Fortify and Boston Materials. In this talk, I will present the technologies behind these companies and discuss some of our ambitions about next generation technologies.

Dr. Erb is a faculty member of the Mechanical and Industrial Engineering Department at Northeastern University in Boston, MA. He heads the Directed Assembly of Particles and Suspensions (DAPS) group that focuses on multi-scale synthesis of advanced materials. Prof. Erb conducted post-doctoral research in the Department of Materials at ETH-Zürich in Switzerland. He received his Ph.D. from Duke University in Mechanical Engineering and Materials Science in 2009 and his B.S. in Electrical Engineering from the University of Rochester in 2004. He also worked as an electrical engineer at Washington Group International. Dr. Erb has 9 patents and patents-pending. He has co-authored 4 book chapters, 38 papers in prominent peer-reviewed journals. Professor Erb has received several entrepreneurial awards including the 2012 Spark Award, the 2017 Outstanding Translation Award, and two Gold Prizes at MassChallenge. His research has led to two successful, venture-backed companies in the Boston area of which he remains the chief scientific adviser. He is very passionate about enhancing teaching and developing the student experience at Northeastern.

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**318 – 320 Curry
Student Center
McLeod Suites
11:00 am**

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Mechanical and
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