

Low-Dimensional Material Engineering: Multi-Physical Interactions

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Friend Center Convocation Room 113

MAE Seminar Series



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Low-dimensional materials exhibit extraordinary intrinsic properties as well as emergent phenomena due to nanoscale confinement effects. Their intrinsic properties can be modulated extrinsically by applying external stimuli such as inducing multi-dimensional structures and controlling interfaces in nanomaterial-based architectures. In addition, data-driven approaches provide complementary tools to understand the fundamental structure-property relations across many length scales. In this talk, I will discuss low-dimensional material engineering approaches including 1) mechanical instability-driven 2D materials engineering for plasmonics and optoelectronics, 2) low-dimensional interfacial engineering for controlling charge carrier transport, and 3) data-driven approaches for structure-property optimization of soft systems. Finally, I will discuss my future vision at Princeton, working at the nexus of low-dimensional material engineering and multi-physical interactions.

Dr. Juyoung Leem is a TomKat Postdoctoral Fellow at Stanford University. Juyoung earned her B.S. and M.S. degrees from KAIST (Korea Advanced Institute of Science and Technology) in 2011 and 2013, and Ph.D. from the University of Illinois at Urbana-Champaign (UIUC) in 2020, all in mechanical engineering. She received Korean Government Scholarship (2013-2015), Graduate Teaching Fellowship from the Department of Mechanical Science and Engineering at UIUC (2018), Materials Research Society (MRS) Graduate Student Award (GSA) Gold award (2019), MRS Arthur Nowick Graduate Student Award (2019), TomKat Postdoctoral Fellowship (2020-2022), and Carbon Journal Prize for outstanding Ph.D. thesis (2020).

