“Lessons from a Droplet: Functional materials through surface and interface engineering”

171 Durham, Thursday, October 27, 11:00 a.m.

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Classical thermodynamics is pegged on the notion of equilibrium, but, not all equilibria states are equally stable – some are ‘more equal than others’. A droplet on a poorly wetting surface exemplifies these inequalities in that; evaporation, imbibition, and internal flux renders an apparent sessile state chaotic. Metastable equilibria states are prevalent in nature especially across surfaces and interfaces, existing in forms of functional concentration gradients (e.g. the synaptic cleft), as self-organized surface-adsorbed adventitious contaminants (e.g. water), among many others. Metastability has often been seen as a challenge in engineering, but can we exploit these states as pathways to new materials, technologies, or energy-efficient process? In this talk, I will present our efforts to design new technologies and processes based on an understand of metastability on surfaces and interfaces. I will discuss how we adopted emulsification to process metals and how that simple process led to various technologies and capabilities in our lab. Highlighted technologies will include heat-free solders, porous oxide photo-catalysts, bio-inspired amphi-phobic materials, and charge tunneling devices.

Refreshments will be provided in 2061 Sweeney Hall at 10:30 a.m.

*If you plan to attend, **email a question** to bellinda@iastate.edu and the speaker will answer your question!*

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