

## UC SAN DIEGO NANOENGINEERING SEMINAR

Monday, February 12<sup>th</sup>, 2018 11:00am - 12:00pm

Faculty Recruitment Seminar Presentation

ASML Conference Center (SME 248)

### “Programmable Assembly and Deformation of Soft Matter”

**Jinhye Bae**

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**Abstract:** Recent interest in shape-programmable and reconfigurable soft matter systems has created new opportunities in applications ranging from soft robotics to biomedical devices through the development of fabrication methods for structures and materials with suitable physical and chemical features for stimuli-triggered actuation. The first part of the talk will describe the implications of surface tension for sub-millimeter scale objects within soft matter systems (*i.e.*, emulsions and hydrogels) and show how to utilize these phenomena to assemble and deform such objects. The second part will move to 3D co-extrusion printing of dissimilar polymeric soft matter, namely a conductive hydrogel and a dielectric elastomer. Lastly, this talk will describe the development of highly sensitive microcalorimetric sensor for investigating the thermodynamics of soft active matter. Understanding the physics, mechanics and dynamics of soft matter systems opens new pathways for exploiting such materials for a wide range of applications.

**Biosketch:** Jinhye Bae is a postdoctoral fellow in the Joost Vlassak group in the John A. Paulson School of Engineering and Applied Sciences at Harvard University. Her current research interests include the development of micromachined pico-calorimetric sensors for bioenergetic measurements, and 3D printable soft ionic devices. After earning her B.S. in Chemical Engineering and Advanced Materials Engineering at Kyung Hee University and her M.S. in Chemical and Biological Engineering at Seoul National University, she received her Ph.D. in the Polymer Science and Engineering at the University of Massachusetts, Amherst in 2015, where she conducted research with Ryan Hayward on fluid interface-mediated assembly and deformation of sub-millimeter sized soft objects, such as polymer chains and stimuli-responsive polymer networks.