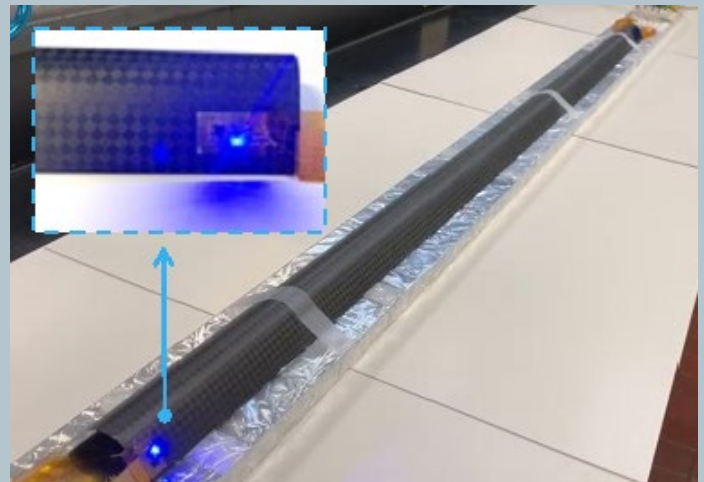


Friday, Feb 17, 2023 11 AM – 12 PM
Klug Memorial Seminar Room, 8500 Boelter
Morphable Intelligent Space Structures

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ABSTRACT: In the future, space structures may be highly intelligent active systems that can morph, adapt, sense, communicate, manage energy, process data, grow, and regenerate like biomaterials and biosystems. If such structures are realized, they may serve as the structural foundation to enable truly intelligent space systems (e.g., spacecraft, space robots, and space architectures) that can pass Turing test. This talk will include several of our group's efforts to pursue this challenging goal. The talk will begin with our work on developing a multifunctional bistable ultrathin composite boom for a 3U CubeSat that is scheduled to be launched to space in early 2023, followed by discussions on the mechanics of bistable booms. I will then present our research on soft electronic skins and microsystems for morphable space structures from a broader perspective beyond the bistable booms. I will conclude the talk with my views on future collaborative, interdisciplinary, and long-term research that needs to be done to realize highly intelligent morphable space structures.



BIO: Dr. Xin Ning has been an assistant professor in the Department of Aerospace Engineering at Pennsylvania State University since August 2018. Dr. Ning was a postdoctoral research associate from 2015 to 2018 at UIUC, where he worked on soft electronics. Dr. Ning received his Ph.D. in Aeronautics in 2015 from Caltech, where he studied buckling-resistant thin shells. Dr. Ning's research focuses on aerospace structures with interdisciplinary work across mechanics, soft electronics, bioelectronics, etc. His group has been supported by AFOSR, NASA, ONR, NSF, and various other external and internal grants. Dr. Ning is a recipient of several awards such as William F. Ballhaus Prize for outstanding doctoral dissertation in aeronautics at Caltech, ONR Young Investigator Award, and ASME Haythornthwaite Foundation Research Initiation Award.