

Title: *Soft electrostatic actuators for wearable robotics.*

Speaker: *Herbert Shea, EPFL, Switzerland*

Abstract

Soft on-body robotics require efficient, fast, lightweight yet high force actuators. I will present my lab's research on wearable haptics driven by electrostatic actuators. We work at the mm to cm scale, combining soft elastomers, compliant electrodes, and high permittivity materials, to create stretchable electrically-operated transducers with high energy density. I will discuss the design and materials challenges in making soft machines generate high forces. Examples of our work include arrays of 120 μm thick on-skin actuators for cutaneous haptics, textile-based electrostatic clutches for kinesthetic haptics, and compliant grippers able to hold 1000x their weight. I will present fiber-format stretchable electrohydrodynamic soft pumps that generates high flow and pressure with no moving parts. Such fiber-shaped pumps give soft robots and wearables the advantages of pneumatic actuation, without requiring an external compressor.

Bio: Herb Shea is a professor of mechanical engineering at the Ecole Polytechnique Fédérale de Lausanne (EPFL) in Switzerland, where he leads the Soft Transducers Lab (EPFL-LMTS). He holds a PhD in physics from Harvard University (1997). His research is centered on electrically-driven elastomer-based actuators for wearables, haptics and soft robotics.

