

Abstract Submitted  
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**Soft Robots: Manipulation, Mobility, and Fast Actuation** ROBERT SHEPHERD, FILIP ILIEVSKI, WONJAE CHOI, ADAM STOKES, STEPHEN MORIN, AARON MAZZEO, REBECCA KRAMER, Harvard, CARMEL MAJIDI, Carnegie Mellon, ROB WOOD, GEORGE WHITESIDES, Harvard — Material innovation will be a key feature in the next generation of robots. A simple, pneumatically powered actuator composed of only soft-elastomers can perform the function of a complex arrangement of mechanical components and electric motors. This talk will focus on soft-lithography as a simple method to fabricate robots—composed of exclusively soft materials (elastomeric polymers). These robots have sophisticated capabilities: a gripper (with no electrical sensors) can manipulate delicate and irregularly shaped objects and a quadrupedal robot can walk to an obstacle (a gap smaller than its walking height) then shrink its body and squeeze through the gap using an undulatory gait. This talk will also introduce a new method of rapidly actuating soft robots. Using this new method, a robot can be caused to jump more than 30 times its height in under 200 milliseconds.

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