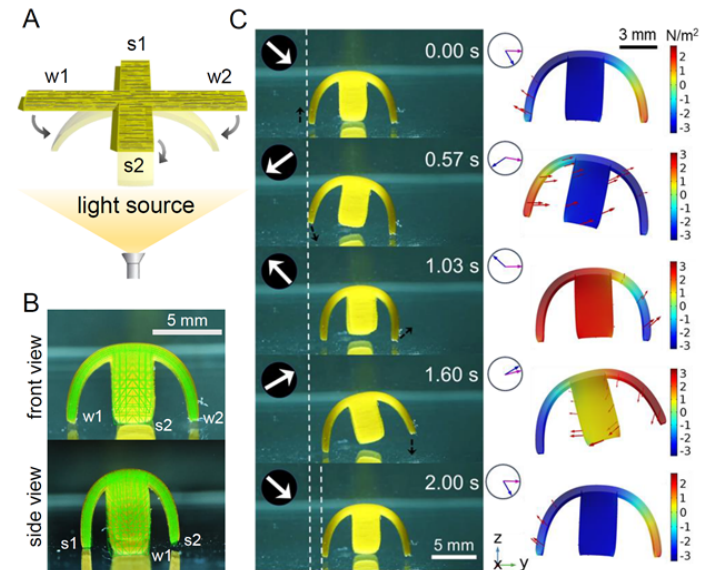


Fast and Programmable Locomotion of Hydrogel-Metal Hybrids Under Light and Magnetic Fields

Chuang Li*, Garrett C. Lau*, Hang Yuan*, Aaveg Aggarwal, Victor Lopez Dominguez, Shuangping Liu, Hiroaki Sai, Liam C. Palmer, Nicholas A. Sather, Tyler J. Pearson, Danna E. Freedman, Pedram Khalili Amiri, Monica Olvera de la Cruz†, Samuel I. Stupp†
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A soft microrobot made of the photo-responsive hydrogel containing aligned ferromagnetic Ni nanowires can be reconfigured and programmed under the control of both light and magnetic fields. It can walk at human speed, pick up and transport cargo to a new location, climb up hills and even break-dance to release a particle.



Light triggered walking under rotating magnetic fields. (A) Schematic of a cross-shaped hydrogel film containing aligned Ni nanowires irradiated from below. (B) Photographs of the bent hydrogels (front and side views) superimposed with green wireframe representations of the calculated photo-actuation using a finite element method. (C) experimental (left) and simulation (right) snapshots of the hydrogel walking from left to right for one cycle.