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**Surface Tension Mediated Conversion of Light into Work**[1] PETER SOLER, DAVID OKAWA, STEFAN PASTINE, ALEX ZETTL, JEAN FRECHET, University of California at Berkeley — We have found that optothermally generated surface tension gradients can be used to produce and control the motion of composites on liquids. A floating object will move when surrounded by an asymmetric surface tension gradient due to an imbalance in the forces it is exposed to. We utilize the absorptive properties of carbon nanotube/polydimethylsiloxane composites to convert light energy into thermal surface tension gradients. Spatially defined irradiation produces localized surface tensions gradients and controlled linear motion. This can be extended to produce controlled motion under blanket irradiation by carefully defining the placement of the absorbing material. This also dictates the location of the optothermal surface tension gradients and can be used to produce linear or rotational motion. Controlled motion under either laser irradiation or focused sunlight is presented, with forces in the range of 1-20 $\mu$N. Millimeter size rotors have been shown to produce rotational motion up to 100 rpm. Current research focuses on the investigation of design parameters that control forces and efficiencies.

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