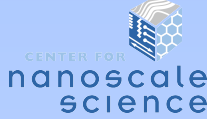
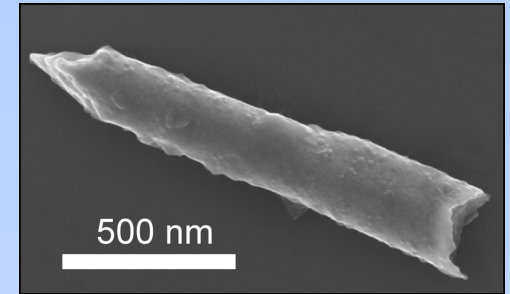
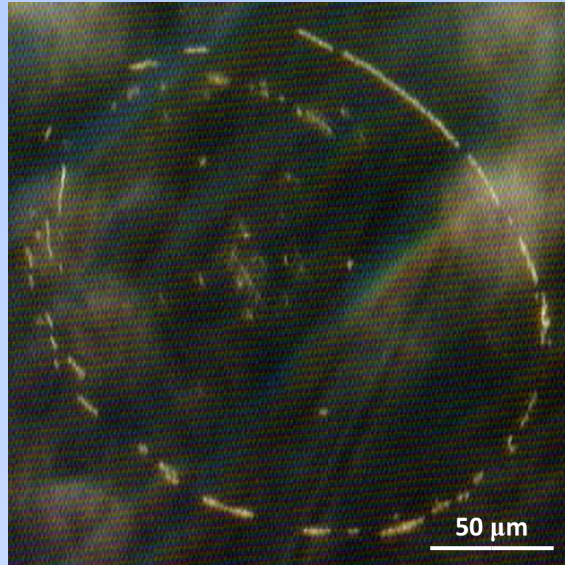
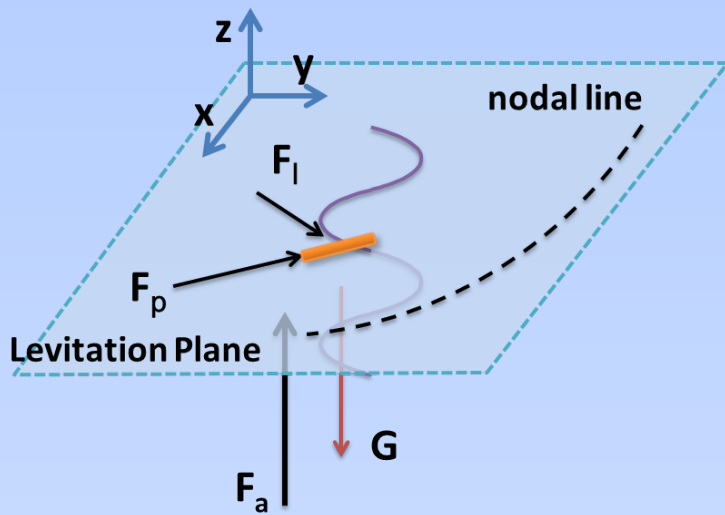


Autonomous Motors Powered by Ultrasound



Penn State MRSEC DMR-0820404: Wei Wang, L. Angelica Castro, Mauricio Hoyos, and Thomas E. Mallouk, "Autonomous motion of metallic micro-rods propelled by ultrasound," submitted to *ACS Nano*



Schematic of forces on metal microrods in ultrasonic fields, spinning polar chains of microrods, and a micrograph of a rocket-shaped Au micro-rod.

MRSEC researchers working in an international collaboration with French scientists at ESPCI (Paris Tech) have discovered that rocket-shaped metallic micro-rods can be propelled through fluids using ultrasound, with fast translation towards the tapered end and rapid rotation & assembly of rods into circular chains that move like conveyor belts. Since most ways to make micro-objects move autonomously in fluids are incompatible with biological fluids, this bio-friendly ultrasound technique may be a first step towards the design of powered micro-robots that can perform microsurgery or deliver drugs or imaging agents to specific parts of the body.