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Capturing stealthy microswimmers into sphere-bound orbits DAISUKE TAKAGI, University of Hawaii at Manoa, JEREMIE PALACCI, New York University, ADAM BRAUNSCHWEIG, University of Miami, MICHAEL SHELLEY, JUN ZHANG, New York University — In potential applications ranging from microfluidic mixing to cargo transport, microscopic swimmers must propel themselves through complex environments. However the interaction of swimmers and obstacles is not well understood. Here we study the autonomous movement of catallytically-driven Au-Pt nanorods through a suspension of solid spheres resting on a horizontal plane. Though the spheres exert no net force or torque on the rods, the rods experience a short-range attraction and orbit around the spheres with essentially no decrease in their speed. We propose that the apparent attraction and speed conservation are a consequence of lubrication effects and the phoretic propulsion mechanism of nanorods. This suggests strategies to capture various self-propelled bodies and motile cells in confined spaces.

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