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An Electrodynamics Ratchet Motor[1] JIUFU LIM, University of Melbourne, School of Chemistry, JOHN SADER, University of Melbourne, Department of Mathematics and Statistics, PAUL MULVANEY, University of Melbourne, School of Chemistry — Brownian ratchets are often used to generate translational motion for biological separation processes and colloidal transport. This talk will propose a Brownian ratchet motor that enables the transduction of electrical energy into rotary micro-mechanical work. This is achieved through torque generation provided by boundary shaping of equipotential surfaces. Stochastic simulations elucidate the performance characteristics of this device as a function of its geometry. Miniaturization to nanoscale dimensions yields rotational speeds in excess of 1kHz, which is comparable to biomolecular motors of similar size.

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Jiufu Lim
University of Melbourne, School of Chemistry

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