

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Leidenfrost Ratchets MICHAEL TAORMINA, University of Oregon, BENJAMIN ALEMAN, University of California, Berkeley, HEINER LINKE, University of Oregon — Properties such as asymmetry and disequilibrium can be exploited in order to obtain useful work from a physical system. Our group is investigating one particularly interesting manifestation of the “ratchet” effect. We find that film-boiling (leidenfrost) drops of liquid placed on an asymmetrically-structured surface experience acceleration significant enough for transport to occur even against small inclines. We believe that a viscous drag force is the mechanism for this net flow of fluid, which is supported by a thin layer of vapor. Because heat is the primary input of energy into the system, this effect could prove useful in cooling applications where a classical “pump” may not be ideal.

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Date submitted: 05 Dec 2005

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