

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Leidenfrost Effect of Water Drops on the Surface of Liquid Nitrogen¹ HEETAEE KIM, GARY A. WILLIAMS, UCLA — The properties of small water drops floating on the surface of liquid nitrogen are studied, a type of Leidenfrost effect. Heat extracted from the water drop evaporates the liquid nitrogen under it, forming a gaseous dimple that the drop floats on, spinning and moving with constant speed across the nitrogen. The temperature of the drop falls with time, finally reaching a Leidenfrost temperature below 0 °C where the ice crystal sinks into the nitrogen. We have measured the time that the drop floats as a function of the drop size and the initial temperature of the water. The time increases linearly with both the drop size and with temperature, in agreement with a simplified force-balance theory including thermal conduction and the vapor and surface tension forces.

¹Work supported by the NSF, DMR 01-3111

Gary Williams
UCLA

Date submitted: 28 Oct 2004

Electronic form version 1.4