Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

**Controlling ice formation on nanostructured superhydrophobic surfaces**[1] TOM KRUPENKIN, University of Wisconsin - Madison, LIDIYA MISHCHENKO, BENJAMIN HATTON, Harvard University, J. ASHLEY TAYLOR, University of Wisconsin - Madison, VAIBHAV BAHADUR, JOANNA AIZENBERG, Harvard University — In this work we describe anti-icing properties of nanostructured superhydrophobic surfaces with well-defined regular arrays of micron and submicron surface features. Both open-cell and closed-cell structures are investigated. Dependence of ice formation dynamics on the temperature, details of the surface topography, substrate material, and other factors are investigated. We find that ice formation on these surfaces can be substantially retarded, with some of the surfaces showing no ice accumulation at temperatures as low as -20 C. The experimental results are in good quantitative agreement with the simple theoretical model based on the classical heterogeneous nucleation theory and wetting dynamics. The results of the work can provide new insight into design and optimization of anti-icing structures and coatings.

[1]funding support from DARPA Grant HR0011-08-C-0114 is appreciated

Tom Krupenkin
University of Wisconsin - Madison

Date submitted: 20 Nov 2009 Electronic form version 1.4