

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Non-spherical Depletants in Colloidal Suspensions**<sup>1</sup> STEPHEN BARR, ERIK LUIJTEN, University of Illinois at Urbana-Champaign — We investigate the effective interactions between spherical colloids induced by rigid rod-like depletants. The size disparity between the colloids and the rods makes conventional simulation methods inefficient. We overcome this by extending the generalized geometric cluster algorithm for colloidal suspensions [J. Liu and E. Luitjen, Phys. Rev. Lett. **92**, 035504 (2004)] to systems of non-spherical particles. We investigate both uncharged and charged colloids and rods, where the electrostatic potential is modeled through a screened interaction. The dependence of the induced depletion potential on both the strength and the range of the electrostatic interactions is quantified. In case of a rod-sphere repulsion, the depletion attraction between the colloids is enhanced as the screening length becomes larger, owing to the increased effective size of the rods. Systems with a rod-sphere attractions are also explored.

<sup>1</sup>This work is supported by the National Science Foundation through Grant No. DMR-0346914.

Stephen Barr  
University of Illinois at Urbana-Champaign

Date submitted: 21 Nov 2007

Electronic form version 1.4