

Abstract Submitted
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Reentrant Disordering of Colloidal Molecular Crystals on 2D Periodic Substrates MICHAEL MIKULIS, Department of Physics, University of California, Davis, CYNTHIA REICHHARDT, CHARLES REICHHARDT, Center for Nonlinear Studies and Theoretical Division, Los Alamos National Laboratory, RICHARD SCALETTAR, GERGELY ZIMANYI, Department of Physics, University of California, Davis — We study colloidal ordering and disordering on two-dimensional periodic substrates where the number of colloids per substrate minima is two or three. The colloids form dimer or trimer states with orientational ordering, referred to as colloidal molecular crystals. At a fixed temperature such that, in the absence of a substrate, the colloids are in a triangular floating solid state, upon increasing the substrate strength we find a transition to an ordered colloidal molecular crystal state, followed by a transition to a disordered state where the colloids still form dimers or trimers but the orientational order is lost. These results are in agreement with recent experiments.

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