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**Geometric Stability and Elastic Response of a Supported Nanoparticle Membrane** BRIAN LEAHY, LUKA POČIVAVSEK, MATI MERON, University of Chicago, DESIREE SALAS, Universidad de Santiago de Chile, KA YEE LEE, BINHUA LIN, University of Chicago — We discuss the mechanical response to compression of a self-assembled gold nanoparticle monolayer and trilayer supported on water. Analysis of the film's buckling morphology under compression reveals an anomalously low bending rigidity for both the monolayer and the trilayer, which we attribute to the spherical geometry of the nanoparticles and poor coupling between layers, respectively. The elastic energy of the trilayers is first delocalized in wrinkles then localized into folds, as predicted by linear and non-linear elastic theory for an inextensible thin film supported on water.

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