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Corralled Colloids in Four Dimensions STEPHEN ANTHONY, Department of Chemistry, University of Illinois, MINSU KIM, Department of Physics, University of Illinois, STEVE GRANICK, Department of Materials Science and Engineering, University of Illinois — Three colloidal particles were placed in small corrals and the strong correlations between their translation and rotation were quantified using the optical anisotropy of MOON (Modulated Optical Nanoprobes) particles to simultaneously measure their translation and rotation in an optical microscope. This system represents the simplest system which can capture one of the relevant components of multi-body interactions, the fact that while two particles can freely rotate together (like gears), once a third particle (or gear) is added there is no universally favorable set of rotations. This simple multi-body system provides a paradigm of how rotation influences translation and vice-versa.

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