1086-70-367 **Richard Montgomery*** (`rmont@ucsc.edu`), Mathematics, UC Santa Cruz, Santa Cruz, CA 95064. *Global Regularization and Reduction for Newtonian N body problems.*

If all bodies are treated equally then regularizing and reducing commute. What is the regularized, reduced phase space? Does it help us in understanding the dynamics? We provide partial answers to some low-dimensional cases, including a complete answer to the 1st question for the planar 3-body problem. At the heart of the matter are certain naturally arising projective varieties depending on N and d, the dimension in which the bodies move. This is joint work with Rick Moeckel. (Received August 26, 2012)