1126-49-189   **Cory Wright*** (`cwright11@unl.edu`), Lincoln, NE 68588, and **Mikil Foss** and **Petronela Radu**. *Existence and regularity of minimizers for nonlocal energy functionals.*

Over the past two decades there has been a surge of mathematical and engineering interest in problems that model phenomena with potentially discontinuous behavior. In 2000 Silling introduced peridynamics, a nonlocal unified framework, which has successfully captured deformations, the structure of fractures, and propagation of cracks in solid materials. Motivated by this theory, we consider energy functionals that involve integral operators with weakly singular kernels. In this talk I will present results with sufficient conditions associated with the existence of minimizers, the necessity of Euler-Lagrange equations, and regularity of nonlocal solutions. (Received January 12, 2017)