A Γ-Convergence approach: From interatomic potentials to crystallization in the Wulff shape

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In this talk I present a joint work [1] with G. Friesecke and B. Schmidt in which ground state configurations of N particles interacting via an interatomic potential are investigated for $N \to \infty$ in the framework of Γ-convergence.

Under simplifying assumptions, namely in case of zero temperature, two instead of three dimensions and in case of special short range potentials, we shall see (1) the formation of a local crystal structure and (2) the formation of a cluster of constant density and finite perimeter. In the special case of the Heitmann-Radin potential, we will further see (3) the emergence of a well-defined anisotropic "surface energy" and (4) the emergence of an overall geometric (Wulff) shape of the atomic minimizer.

[1] Y. AU YEUNG, G. FRIESECKE, B. SCHMIDT: *Minimizing atomic configurations of short range pair potentials in two dimensions: crystallization in the Wulff shape. In preparation.*