

1135-VN-3040 **Brittan Farmer*** (bafarmer@umn.edu), 127 Vincent Hall, 206 Church Street, Minneapolis, MN
55455, and **Selim Esedoglu** and **Peter Smereka**. *Crystallization for a Brenner-like potential.*

Graphene is a carbon molecule with the structure of a honeycomb lattice. We show how this structure can arise in two dimensions as the minimizer of an interaction energy with two-body and three-body terms. In the engineering literature, the Brenner potential is commonly used to describe the interactions between carbon atoms. We consider a potential of Stillinger-Weber type that incorporates certain characteristics of the Brenner potential: the preferred bond angles are 180 degrees and all interactions have a cutoff radius. We show that the thermodynamic limit of the ground state energy per particle is the same as that of a honeycomb lattice. We also prove that, subject to periodic boundary conditions, the minimizers are translated versions of the honeycomb lattice. (Received September 26, 2017)