1125-35-109 **Oleksandr Misiats*** (om25@nyu.edu), 15 Washington pl, 4M, New York, NY 10003, and **Robert Kohn** and **Stefan Muller**. *Analysis of microstructures in martensite-austenite phase transitions using sharp variational bounds.*

We consider a singularly perturbed variational problem of minimizing the the surface and elastic energies of the order parameter $u$ in a two-dimensional rectangular domain. This model, originally suggested by Kohn and Muller, comes from martensitic phase transitions, in which two distinct phases of the martensite correspond to $u_y(x, y) = 1$ and $u_y(x, y) = -1$. It was observed that minimizers develop self-similar branched microstructures in the case when the boundary condition is not compatible with either of the phases, and may have zigzag microstructures otherwise. In my talk, I will describe several patterns of the behavior of minimizers depending on the choice of boundary conditions, derive sharp global and local energy bounds, and discuss the applications to 2D and 3D linear elasticity models. (Received July 30, 2016)