

# TEMPLE UNIVERSITY

Department of Mathematics

## Analysis Seminar

Room 617 Wachman Hall

Monday, September 27 2021, 2:30 p.m.

*Relaxation of functionals with bulk and surface  
energy terms*

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Abstract: The minimization of energy functionals has a wide range of applications both in pure and applied disciplines, where the existence of minimizers is routinely proved by means of the so-called “direct method in the Calculus of Variations”. This, in turn, relies on showing that the energy under consideration is lower semicontinuous. If this property fails, valuable insight may still be gained by characterizing the lower semicontinuous envelop of the energy, referred to as the relaxed energy.

Motivated by problems in the van der Waals-Cahn-Hilliard theory of liquid-liquid phase transitions, and by some classical examples due to Modica, in this talk, we will study the lower semicontinuity of energy functionals with bulk and surface terms. Since the presence of corners in the domain can affect the lower semicontinuity of the energies under consideration, we will focus on uncovering how the roughness of the domain enters the relaxation procedure.