

The College of Arts & Sciences
Department of Mathematical Sciences
Colloquium

Professor Alex Misiats
Virginia Commonwealth University
Thursday, October 15, 2026
Campus Rec Center Room 3220
4:00-5:00pm

***Linear Elastic Models of Shape Memory
Alloys: Variational Perspective***

In this talk I will describe a class of minimization problems arising in modelling shape memory alloys. I will start with a shape memory material illustration, followed by a simple one dimensional model of it. Its extensions in 2D and 3D will help us understand the energetic mechanism behind the formation of twin patterns in physical experiments. By means of sharp upper and lower bounds, we show that the experimentally observed structures provide optimal energy scaling law. Furthermore, under certain assumptions we will see that some of these patterns are true energy minimizers - a rare find in problems of this type! I will also discuss the most recent development in this direction, which allowed us to extend this result to an abstract two-well setting, with the further extension to model multiscale patterns. These patterns appear in recent physical experiments which involve mixtures of four twins. This is a joint project with Sergio Conti (Bonn)

Refreshments will be served 3:15-3:45 pm in the Faculty Lounge
4118 French Hall West