

TOPICS IN GEOMETRIC ANALYSIS

MAY 18-24,
2019

IAS

WOMEN AND
MATHEMATICS

ORGANIZERS

SUN-YUNG ALICE CHANG Princeton University
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TERNG LECTURE

**Uniform Rectifiability via Perimeter
Minimization / Tatiana Toro**
University of Washington

Quantitative geometric measure theory has played a fundamental role in the development of harmonic analysis, potential theory and partial differential equations on non-smooth domains. In general the tools used in this area differ greatly from those used in geometric measure theory as it appears in the context of geometric analysis. In this course we will discuss how ideas arising when studying perimeter minimization questions yield interesting and powerful results concerning uniform rectifiability of sets. **The course will be mostly self-contained.**

UHLENBECK LECTURE

**Ancient solutions to Geometric Flows /
Panagiota Daskalopoulos**
Columbia University

Some of the most important problems in *geometric evolution partial differential equations* are related to the understanding of *singularities*. This usually happens through a blow up procedure near the singularity which uses the scaling properties of the equation. In the case of a *parabolic* equation the blow up analysis often leads to special solutions which are defined for all time $-\infty < t \leq T$, $T \leq +\infty$. We refer to them as *ancient solutions*. The classification of such solutions often sheds new insight upon the singularity analysis.

In this lecture series we will discuss *Uniqueness Theorems* for ancient solutions to parabolic partial differential equations, starting from the Heat equation and extending to the Semi-linear heat equation, the Mean curvature flow, the Ricci flow and the Yamabe flow. We will also discuss the construction of new solutions from the gluing of two or more solitons.

Prerequisites for program:
Multivariable calculus and an undergraduate course in analysis.

Application Deadline: February 17, 2019
For more information visit math.ias.edu/wam/2019



A Program of the Institute for Advanced Study
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