

Title: "Harmonic mappings with free boundaries and their heat flows"

Speaker: Yannick Sire (JHU)

Membro del collegio proponente: Giovanna Citti

Ore frontali di lezione: 6

Periodo di lezione: 27 november – 9 december

Tentative skedule

thursday 27 november (2 hours)

tuesday 2 december (1 hour)

thursday 4 december (2 hours)

tuesday 9 december (1 hour)

Settore/i disciplinare del corso: Mathematical Analysis

Tipologia di corso: Avanzato

Modalità di verifica dell'apprendimento: Oral presentation or discussion

Abstract: The aim of this series of lectures is to describe recent advances in the theory of harmonic mappings with free boundaries. Those maps are instrumental in several geometric problems such as extremal metrics for the Steklov spectrum. I will describe both the elliptic and the parabolic theory, emphasizing in existence and regularity aspects. I will also mention several open problems along the way.

Tentative plan of the lectures.

1- Theory of Standard Harmonic mappings: existence, regularity and their parabolic deformation.

2- Harmonic maps with free boundary: partial regularity

3- Approach to harmonic maps with free boundary via the Dirichlet-to-Neumann map; half-harmonic maps of Da Lio and Riviere. Construction of their heat flows.

4- Partial regularity of heat flows. Plateau flow of Struwe.

Keywords: Harmonic maps, free boundaries, heat flows, partial regularity, monotonicity methods.