Incontri di Analisi Matematica tra Firenze, Pisa e Siena

Report of Contributions

Contribution ID: **1** Type: **not specified**

Elastic energy for networks

Friday, 30 October 2020 14:40 (50 minutes)

In the last decades the study of the Willmore functional for surfaces and curves raised the attention of an increasing number of mathematicians.
The reason is twofold: the analysis of the minimization of the Willmore functional presents interesting features and issues from a purely mathematical point of view and on the other hand the energy naturally arises in Mechanics and Materials Science (for instance in the study of biological membranes). In the case of curves, the Willmore functional reduces to the total squared curvature and it is commonly known as elastic energy. In this talk I will give an overview of results related to the minimization of the elastic energy in the class of networks (finite union of curves whose end points meet in junctions).
I will also consider the L^2-gradient flow of the elastic energy of networks which leads to a fourth order evolution law with non-trivial nonlinear boundary conditions. I will give a wellposedness result and I will investigate the long time behaviour of solutions.

Presenter: PLUDA, Alessandra (Università di Pisa)

Contribution ID: **2** Type: **not specified**

On the regularity of singular sets of minimizers for the Mumford-Shah energy

Friday, 30 October 2020 15:40 (50 minutes)

We will survey on the regularity theory of minimizers of the Mumford-Shah functional, focusing in particular on that of the corresponding singular sets. Starting with nowadays classical results, we will finally discuss more recent developments.

Presenter: FOCARDI, Matteo (Università degli Studi di Firenze)

Contribution ID: **3** Type: **not specified**

Some recent developments in the problem of relaxation of the area functional

Friday, 30 October 2020 16:50 (50 minutes)

We introduce the area functional for smooth maps u, namely the functional measuring the area of the graph of u. We discuss how to extend it to L1 and analyze the related questions of determining the domain and the expression of the extended functional. For graphs of codimension greater than 1 the problem is open, and we restrict our discussion to some examples where many variants of the Plateau problems pop out. We discuss some recent partial results and list some important open problems, which strongly show how the question is related to existence and regularity of solutions to Plateau problems in codimension >1.

Presenter: SCALA, Riccardo (Università di Siena)