

JOURNÉE THÉMATIQUE “CALCUL DES VARIATIONS”

FRUMAM, MARSEILLE – 16/12/2011

Schedule

09:30 — 10:20	Filippo Santambrogio
10:20 — 10:40	Coffee break
10:40 — 11:30	Yannick Sire
12:00 — 14:00	Lunch time
14:00 — 14:50	Adrien Blanchet
14:50 — 15:10	Break
15:10 — 16:00	Guido De Philippis

Talks: titles and abstracts

ADRIEN BLANCHET (Université Toulouse 1)
Urban equilibria

Abstract: We consider an economic equilibrium problem for a population density in a spatial economy, where the utility of the agents depends on social interactions with the other agents, the cost to access them, and the cost of land. We perform a rigorous mathematical analysis of the equilibrium condition, by providing a variational characterisation when the geographical space is a convex domain, and classifying all the possible equilibria arising on a circle. The mathematical tools for the analysis of the convex case involve the theory of optimal transport, while the circle case is mainly handled by ordinary differential equation techniques.

GUIDO DE PHILIPPIS (Scuola Normale Superiore di Pisa)
Stability for the Plateau problem

Abstract: The classical Plateau problem concerns finding the surface of minimal area spanning a given boundary. A question which naturally arises is the following: if a surface

has area very close to the one of a minimum how close is it to the surface realizing the minimum? I will show as for smooth minimizers a natural global stability inequality is equivalent to its infinitesimal counterpart. Finally using a “quantitative” calibration argument, I will extend this stability inequality to Simons cones, the first example of singular surfaces minimizing the area functional (joint work with Francesco Maggi).

FILIPPO SANTAMBROGIO (Université Paris-Sud)

Asymptotical problems in optimal location: classical and new results

Abstract: The classical location problem (also known as Fermat-Weber problem) consists in looking for the set Σ which optimizes $\int d(x, \Sigma) d\mu(x)$ among all possible sets with a bound on the number of points $\#\Sigma \leq N$, the measure μ being fixed and standing, for instance, for the population density in a region where we need to install facilities. Σ stands in this case for the location of these facilities. A typical asymptotical question is to find the limit density of the points of Σ when $N \rightarrow \infty$. We will review the existing results on this question, which all deal with the case $\mu \geq 0$, and discuss and interpret the case where μ may be a signed measure, according to a recent joint paper with Giuseppe Buttazzo and Eugene Stepanov.

YANNICK SIRE (Université Aix-Marseille III)

Nonlinear problems with integral diffusion

Astract: In this talk, I would like to describe several recent results about non linear elliptic PDEs involving integral diffusion.