Théorie de la mesure géométrique et calcul des variations

mardi 13 décembre 2022 - mercredi 14 décembre 2022

Nancy IECL

Programme

MARDI 13 décembre
Faculté de sciences, AMPHI 5

(The faculté de sciences building is the one written "Amphitheatre 8" on it in big letters)

10h00- Accueil Café

Chairman: Antoine Henrot

11h00 Guy David- *Regularity of sets in a (for instance convex) domain that minimize the perimeter*

12h00 Jules Candau-Tilh - *An isoperimetric problem with a non-local interaction of Wasserstein type*

12h30 Pause Déjeuner
IECL, salle de conférences

Chairman: Gilles Francfort

14h30 Gisella Croce - *A Poincaré-Wirtinger inequality with three constraints*

15h30 Jean-François Babadjian - *Characteristic flow and partial uniqueness for a non strictly convex problem with linear growth in the calculus of variations*

16h30 pause café

Chairman: Matthieu Bonnivard

17h00 Yana Teplitskaya - *On maximal distance minimizers*

17h30 Michael Goldman - *Some regularity results for isoperimetric problems with very strong interactions*

18h30 fin de journée 1

MERCREDI 14 décembre
IECL, Salle de conférences

9h00 café

Chairman: Reza Pakzad

9h30 Ilaria Lucardesi - *On Kohler-Jobin type inequalities: a survey and an open problem.*

10h30 pause Café

11h00 Thierry De Pauw - *Universal Radon-Nikodýmification of arbitrary measure spaces: Motivations, struggles, general theorem, particular cases, and application to SBV dual.*

12h00 Camille Labourie - *Epsilon-Regularity for Griffith almost-minimizers in* $\mathbb{R}^N$ *under a separating condition*

12h30-14h30 Pause midi
Faculté de sciences, AMPHI 5

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Chairman: Benoit Merlet

14h30 Peter Gladbach - *Variational interacting particle systems and their continuous limits*

15h00 Antonin Chambolle - *Variational Convergence of Liquid Crystal Energies to Line and Surface Energies*

16h00 - fin - discussions libres

Résumés.

Jean-François Babadjian - *Characteristic flow and partial uniqueness for a non strictly convex problem with linear growth in the calculus of variations*

Abstract: In this work, in collaboration with Gilles Francfort, we are interested in the hyperbolic structure with respect to the spatial variables of a variational problem coming from the theory of plasticity. Minimizing solutions suffer of two pathologies: the absence of strict convexity of the energy leads to nonuniqueness of minimizers, and the linear growth at infinity implies the appearance of singularities. Taking care of the hyperbolic character of the underlying system of PDEs, the analysis of the characteristic flow leads to rigidity properties of the solutions. It allows one to describe accurately the geometric structure of the solutions which, sometimes, ensures the uniqueness of the solution.

Antonin Chambolle - *Variational Convergence of Liquid Crystal Energies to Line and Surface Energies*

Abstract: In this work in collaboration with Dominik Stantejsky (now at McMaster Univ, Canada) and François Alouges (now at Université Paris-Saclay) we study in a particular regime the singular limit of energies arising in the theory of liquid crystals (Landau-De Gennes energies). The regime is such that the 2-dimensional singularities corresponding to a complete rotation of the molecules across a plane have an energy of the same order as the 1-dimensional singularities corresponding to the directors rotating around a line. We give a description of the corresponding limiting energy.

Guy David *Regularity of sets in a (for instance convex) domain that minimize the perimeter.*

Abstract. This is ongoing joint work with D. Jerison. We consider subsets E of a domain U that minimize the perimeter in U with a given volume, or more generally almost minimizers. The main point is that the boundary of such a set E satisfies some quantitative connectivity properties. In particular we get a different proof of a connectedness result of Almgren and De Giorgi writen by Bombieri-Giusti.

Peter Gladbach Variational interacting particle systems and their continuous limits

Abstract: Together with Bernhard Kekpa (Bonn), we show that tsolutions to the Vlasov equation are precisely ciritcal points of a mean-field action functional. We then study the existence of minimizers for these functionals and characterize their relaxation using the convex order of probability measures.