Partial differential equations linked to curvature problems

Organizers: Paul Laurain (Université Paris 7) and Jorge Lira (Universidade Federal do Ceará)

Many geometric problems can be formulated in terms of partial differential equations. For instance, prescribing the scalar curvature motivates the study of the conformal laplacian. It is also well-known that uniformization of manifolds involves some diffusion equation such as Ricci flow. Conversely, some results on PDEs can have strong consequences in Geometry, such as the two-point maximum principle which has led to some obstruction properties in Riemannian geometry.

Despite the great development of this field during the two last decades, there is still many things to do, especially for extrinsic problems. For instance very little is known about the problem of prescribing (non constant) mean curvature. The extrinsic counterpart of the Ricci flow, namely the mean curvature flow, is still not completely understood. We point out that some progress in this topic could give the solution to some very old conjecture such as the Schoenflies problem. This interchange between Geometry and PDEs has very recently produced important advances about Willmore surfaces, the conformal counterpart of minimal surfaces.

The main aim of this session is to bring together people with strong geometric and/or analytical background to see how recent problems involving curvature and innovative PDEs tools can interact. An other important aim will be to explore opportunities to build strong partnership in Geometric Analysis between researchers and students from French and Brazilian communities.

French Speakers:

- Nicolas Marque
  (Univeristé Paris 7)

- Philippe Castillon
  (Univeristé de Montpellier)

- Remy Rodiac
  (Université Catholique de Louvain-la-Neuve)

- Romain Petrides
  (Université Paris 7)

Brazilian Speakers:

- Gabriela Wanderley
  (Universidade Federal da Paraíba)

- Rafael Montezuma
  (Princeton Univeristy)

- Abigail Folha
  (Universidade Federal Fluminense)

- Marcos Cavalcante
  (Universidade Federal de Alagoas)