Lagrangian - A Lagrangian approach: from conservation laws to line-energy Ginzburg-Landau models

Non-linear partial differential equations play an important role in mathematics and arise in several physical and engineering models. Many of these models exhibit a lack of regularity. Handling irregular solutions that can capture the peculiar dynamics of physical processes poses great mathematical challenges: most of the tools developed in smooth settings are ineffective. Funded by the Marie Skłodowska-Curie Actions programme, the Lagrangian project aims to extend the recently introduced Lagrangian representation approach for non-linear conservation laws to the study of multi-dimensional and non-entropic weak solutions. The project will also leverage Lagrangian representation techniques to address challenging questions in the analysis of conservation laws in control theory, which also have application in mixed models of traffic flow.

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