Special Issue

Inverse Problems and Differential Geometry: Theory and Applications

Message from the Guest Editor

An “inverse problem” appears whenever we seek to invert a mapping between two sets. However, within the field of inverse problems the two sets are normally function spaces and the mapping to be inverted involves the solution of some partial differential equations (PDEs). On the theoretical side we may ask if the inverse problem is well-posed in the sense of Hadamard: a continuous inverse mapping exists and is unique. On the practical side we may seek algorithms to calculate the inverse mapping.

Geometric structure appears naturally in many inverse problems because of the symmetries of the PDEs involved. For example, if we allow the conductivity to be anisotropic in Calderón’s problem then the solution of the inverse problem becomes non-unique because the structure of the PDE is preserved by diffeomorphism. Indeed, non-uniqueness in many inverse problems arises as a result of an invariance of the underlying PDE, which leads us to consider differential geometry.

This Special Issue will accept high-quality papers with original research which combines inverse problems and differential geometry.

Guest Editor

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Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

Editor-in-Chief

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