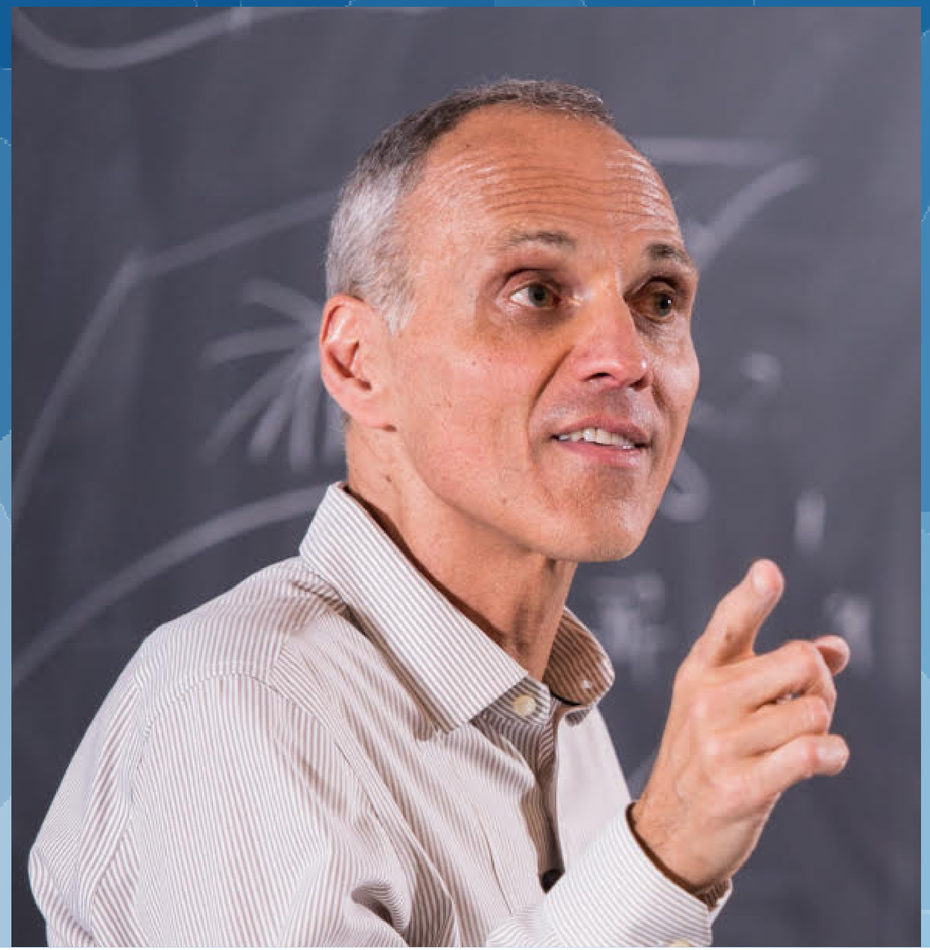
Joint Mathematics Colloquium
ICMAT-UAM-UC3M-UCM

A survey of the Calderón inverse problem



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In its geometric formulation, the Calderón inverse problem consists in showing that the metric of a smooth compact Riemannian manifold with boundary is uniquely determined (up to some natural gauge equivalences) from the knowledge of the Dirichlet-to-Neumann map for the Laplacian, that is the map that assigns to data prescribed on the boundary of the manifold the normal derivative of the unique solution of the corresponding solution to Laplace's equation. While the Calderón inverse problem is still open in its full generality, there are a number of results providing either an affirmative answer or counterexamples, depending on which special assumptions are made about the background geometry. After introducing the Calderón inverse problem, I will review some of these uniqueness and non-uniqueness results and time permitting, I will discuss the relation between the Calderón inverse problem and the problem of boundary rigidity, which is whether the knowledge of the boundary distance function determines uniquely the metric in the interior of the manifold.

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