

## MATH-IMS Joint Pure Mathematics Colloquium Series The Chinese University of Hong Kong

*This Colloquium Series in Pure Mathematics is organized by the Department of Mathematics and the Institute of Mathematical Sciences (IMS) at The Chinese University of Hong Kong. The series focuses on all areas of pure mathematics together with theoretical developments and applications.*

**Date:** October 14, 2022 (Friday)

**Time:** 4:30-5:30PM (Hong Kong Time)

**Zoom Link:** <https://cuhk.zoom.us/j/98846779826>

### Smooth and non-smooth aspects of Ricci curvature lower bounds

*Speaker: Professor Andrea Mondino  
University of Oxford*

**Abstract:** After recalling the basic notions coming from differential geometry, the talk will be focused on spaces satisfying Ricci curvature lower bounds. The idea of compactifying the space of Riemannian manifolds satisfying Ricci curvature lower bounds goes back to Gromov in the 80s and was pushed by Cheeger and Colding in the 90s who investigated the fine structure of possibly non-smooth limit spaces. A completely new approach via optimal transportation was proposed by Sturm and Lott-Villani around fifteen years ago. Via such an approach one can give a precise definition of what means for a non-smooth space to have Ricci curvature bounded below. Such an approach has been refined in the last years giving new insights to the theory and yielding applications which seems to be new even for smooth Riemannian manifolds. The talk is meant to be an introduction to the topic, accessible to non-specialists and as self-contained as possible.

**Bio:** Prof. Mondino obtained his PhD at Scuola Internazionale Superiore di Studi Avanzati (SISSA), Trieste in 2011 under the supervision of Prof. Andrea Malchiodi. After graduation, he was appointed as a postdoc at Scuola Normale Superiore, ETH fellow and Lecturer at ETH-Zurich, Huneke Fellow at MSRI-Berkeley and Lecturer Zurich University. In 2016, Prof. Mondino joined the University of Warwick as an Assistant Professor and then later moved to University of Oxford as a Reader 2019. In August 2022, Prof. Mondino is promoted to a Professor of Mathematics. Prof. Mondino's research interest broadly covers a variety of topics in geometric analysis, Geometric Measure Theory and Partial Differential Equations, especially on the theory of non-smooth spaces with lower curvature bounds. In recognition of his fundamental contributions in these areas, Prof. Mondino was awarded the Whitehead Prize in 2020.