

Week 1 of the Workshop on
“Non-regular Spacetime Geometry”

March 13 - 17, 2023

organized by

Piotr T. Chruściel (U of Vienna), Melanie Graf (U Tübingen), Michael Kunzinger (U of Vienna),
Ettore Minguzzi (U Florence), Roland Steinbauer (U of Vienna)

- **Monday, March 13th, 2023**

09:00 – 09:30 **Registration & Welcome**

09:30 – 10:15 **Robert McCann (U Toronto)**

A synthetic null energy condition

10:15 – 10:45 **Coffee Break**

10:45 – 11:30 **Andrea Mondino (U Oxford)**

Timelike Ricci bounds and Einstein's theory of gravity in a non smooth setting

11:30 – 12:15 **Fabio Cavalletti (SISSA, Trieste)**

Synthetic time-like Ricci curvature lower bounds: the isoperimetric inequality

12:15 – 14:00 **Lunch Break**

14:00 – 14:45 **Olaf Müller (HU Berlin)**

Lorentzian functors and closures of relevant subsets of Lorentzian Gromov-Hausdorff space

14:45 – 15:30 **Felix Rott (U of Vienna)**

Alexandrov's Patchwork and the Bonnet Myers theorem for Lorentzian length spaces

15:30 – 16:00 **Coffee Break**

16:00 – 16:45 **Mathias Braun (U Toronto)**

Gromov's reconstruction theorem and measured Gromov-Hausdorff convergence in Lorentzian geometry

16:45 – 17:30 **Clemens Sämann (U Oxford)**

A Lorentzian analog for Hausdorff dimension and measure

- **Tuesday, March 14th, 2023**

09:00 – 09:45 **Miguel Sanchez (U Granada)**

Some issues on the regularity of spacetimes related to Finsler Geometry

09:45 – 10:30 **Shin-ichi Ohta (U Osaka)**

Geometry of weighted Finsler spacetimes

10:30 – 11:00 **Coffee Break**

11:00 – 11:45 **Miguel Ángel Javaloyes Victoria (U Murcia)**

Finsler spacetimes: regularity and physical interpretations

11:45 – 12:30 **Eleni Kontou (U Amsterdam)**

“Generalizations of classical relativity theorems”

12:30 – 14:00 **Lunch Break**

14:00 – 14:45 **Marc Mars (USAL)**

Abstract null geometry, the constraint tensor and applications

14:45 – 15:30 **Miguel Manzano (U Salamanca)**

Null shells: abstract formulation of the junction conditions and particularization to cut-and-paste

15:30 – 16:00 **Coffee Break**

16:00 – 16:45 **Moritz Reintjes (City U of Hong Kong)**

On the regularity implied by the assumptions of geometry

16:45 – 17:30 **Charlie Beil (U of Graz)**

Spacetime geometry of spin, polarization, and wavefunction collapse

- **Wednesday, March 15th, 2023**

09:00 – 09:45 **Nicola Gigli (SISSA, Trieste)**

Differentiating in a non-differentiable environment

09:45 – 10:30 **Chiara Rigoni (U of Vienna)**

Tamed spaces - Dirichlet spaces with distribution-valued Ricci bounds

10:30 – 11:00 **Coffee Break**

11:00 – 11:45 **Didier Solis Gamboa (UADY)**

The space of causal diamonds as a Lorentzian pre-length space

11:45 – 12:30 **Lorenzo Mazzieri (University of Trento)**

Some Mass Concepts in General Relativity

12:30 – 14:00 **Lunch Break**

14:00 – 14:45 **Brian Allen (CUNY)**

Properties of the null distance on a spacetime

14:45 – 15:30 **Leonardo García-Heveling (Radboud U)**

Global hyperbolicity through the eyes of the null distance

15:30 – 16:00 **Coffee Break**

16:00 – 16:45 **Tobias Beran (U of Vienna)**

Midpoint characterization for intrinsic spaces

- **Thursday, March 16th, 2023**

09:00 – 09:45 **Sumati Surya (RRI, Bangalore)**

Causal Set Kinematics: Reconstructing Spacetime Geometry from Random Posets

09:45 – 10:30 **Patrick Bernard (U Paris-Dauphine)**

Uniform temporal functions

10:30 – 11:00 **Coffee Break**

11:00 – 11:45 **Tomasz Miller (Jagiellonian University)**

Causal evolution of measures and continuity equation

11:45 – 12:30 **Pierre Martinetti (UNIGE & INFN)**

Dual of the dual formula for the distance in noncommutative geometry

12:30 – 14:00 **Lunch Break**

14:00 – 14:45 **Felix Finster (U Regensburg)**

Quasi-Local Mass, Positive Scalar Curvature and a Positive Mass Theorem for Causal Variational Principles

14:45 – 15:30 **Eric Ling (Rutgers U)**

Remarks on the cosmological constant appearing as an initial condition for Milne-like spacetimes

15:30 – 16:00 **Coffee Break**

18:30 – 23:00 **Conference Dinner**

• **Friday, March 17th, 2023**

09:00 – 09:45 **Jose M M Senovilla (UPV/EHU)**

Beyond black holes: uniqueness properties of “ultra-massive” spacetimes

09:45 – 10:30 **Christopher Fewster (U of York)**

Nonlocal generalisations of Green hyperbolicity

10:30 – 11:00 **Coffee Break**

11:00 – 11:45 **James A. Vickers (U Southampton)**

Quantum Field Theory on low-regularity spacetimes

11:45 – 12:30 **Stefan Suhr (Ruhr U, Bochum)**

Gromov-Hausdorff Theory for Lorentzian Spaces

12:30 – 14:00 **Lunch Break**

14:00 – 14:45 **Stacey Harris (Saint Louis U)**

“NiceFuture Causal Boundary at Finite Distance and Low-Regularity Extension

14:45 – 15:30 **Jan Sbierski (U Edinburgh)**

On the uniqueness problem for spacetime extensions

15:30 – 16:00 **Coffee Break**

16:00 – 16:45 **Argam Ohanyan (U of Vienna)**

Sobolev calculus in synthetic Lorentzian geometry

All talks take place at ESI Boltzmann Lecture Hall! Wearing an FFP2 mask is strongly recommended!