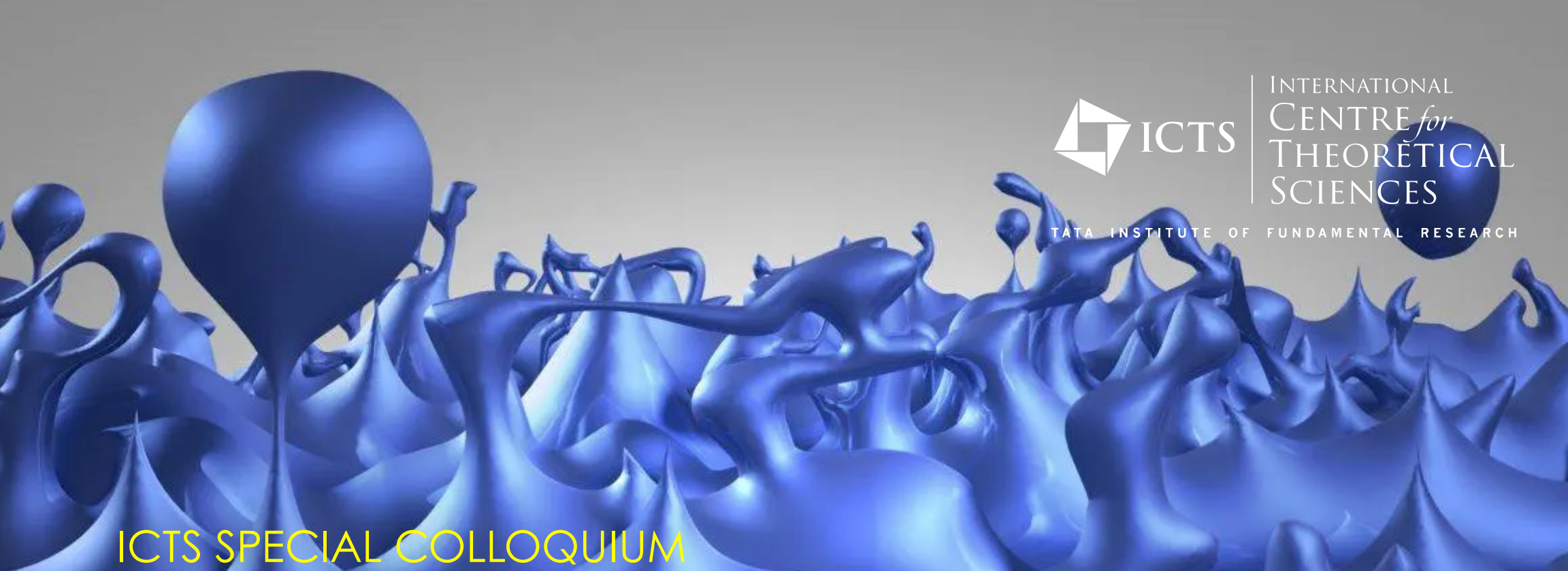

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# Quantum bounds to chaos and fluctuation - dissipation equality

In the past years there has been renewed interest in identifying bounds, originating from quantum mechanics, on various quantities such as transport coefficients, including conductivity and viscosity. These remain elusive, but a “bound to chaos,” limiting the value of a Lyapunov exponent, was derived by Maldacena, Shenker, and Stanford. The reason this result has generated so much interest in field theory is that Black Holes are expected to saturate these bounds; conversely, any model that does so is a potential toy model for a Black Hole. The MSS derivation is not difficult, but it can be made even simpler by recasting it in a way that shows that the bound follows directly from the fluctuation–dissipation (KMS) relation, fundamental in statistical mechanics.

## Jorge Kurchan

LPENS, École Normale Supérieure, Paris

Jorge Kurchan is a statistical physicist whose work has significantly shaped modern approaches to non-equilibrium statistical physics and complex systems. He is known for fundamental contributions to the theory of glassy dynamics, stochastic processes, and disordered systems, providing key insights into the behaviour of materials and dynamical systems far from equilibrium. Kurchan is Director of Exceptional Class Research at the French National Centre for Scientific Research (CNRS), where he continues to influence the field through both foundational and interdisciplinary research. His achievements have been recognised with major distinctions, including the Prix Paul Langevin (2002), the Prix Servant of the French Academy of Sciences (2005), and the 2025 Lars Onsager Prize of the American Physical Society.

## Wed, 10 December 2025

16:15 - 17:45

Zoom link: https://shorturl.at/2hL7p

Meeting ID: 985 0605 5352

Passcode: 010102

## Ramanujan Lecture Hall