



# INVITATION

as part of the Mathematical Physics Theory Seminar

to the talk by

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on

***“Where Time Begins: Causal Consequences of  
Signature Change”***

## **Abstract:**

The Hartle-Hawking "no-boundary" proposal redefines spacetime by offering a new way of thinking about the origin of the universe. Mathematically, this involves signature-type changing manifolds where a Riemannian region is smoothly joined to a Lorentzian region at the transition surface where time begins.

Motivated by the "no-boundary" proposal, I present a segment of a new framework for signature-changing manifolds, characterized by a degenerate yet smooth metric. Then I adapt some Lorentzian tools and results to the signature-type changing scenario, introducing new definitions that carry unforeseen causal implications. One such noteworthy consequence is the presence of time-reversing loops through each point on the locus of signature change.

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**Time: Tuesday, 17 June 2025, 2:00 p.m.**

**Location: Erwin-Schrödinger Lecture Hall, 1090 Vienna, Boltzmannngasse 5, 5<sup>th</sup> floor**