



# Sommerfeld Theory Colloquium

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Cosmological singularities, quantum chaos and prime numbers

At a singularity the continuum description of spacetime breaks down and one can hope that the microscopic constituents will be revealed. Over 50 years ago, Belinski-Khalatnikov-Lifshitz (BKL) argued that the dynamics of spacetime close to the Big Bang singularity (or inside black holes) is chaotic and inhomogeneous. I will revisit the BKL scenario within a modern understanding of quantum chaos and holographic duality. I will argue that the remarkable modular symmetries that arise in the near-singularity dynamics suggests a dual description of the start of time as a so-called "primon gas", a description that is at once both simple and also connects with deep results from number theory.

Wednesday, 25 June 2025, 16:15h, Room A348, Theresienstr. 37/III

Prof. Ivo Sachs