

Einladung zum Physikalischen Kolloquium

30.01.2026 Jens Boos, Karlsruher Institut für Technologie

»Black holes as probes for new physics«

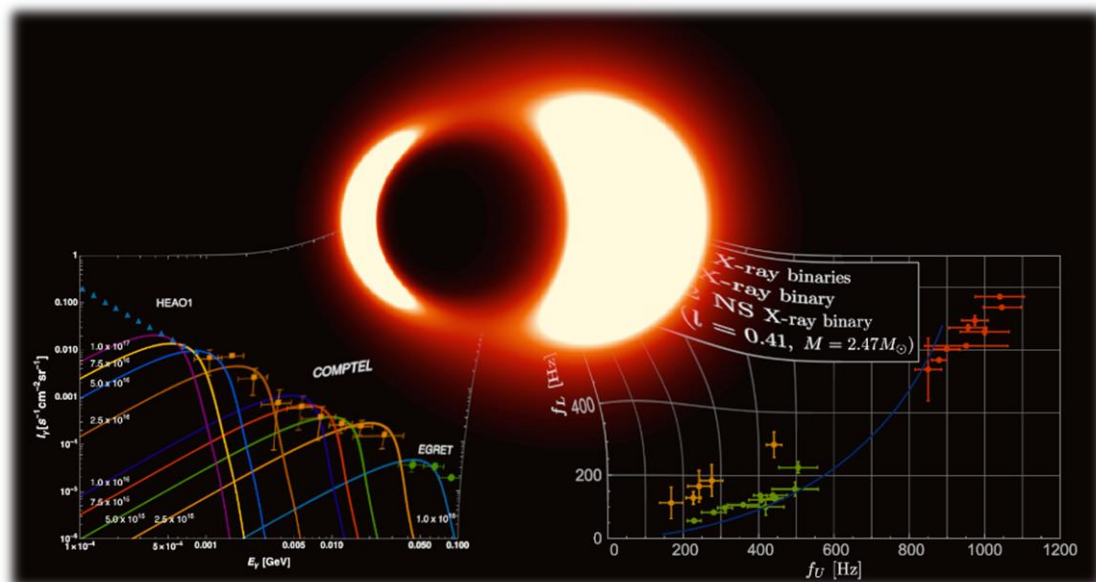
Einführung: M. Mühleleitner

While general relativity has passed every experimental test to date, it predicts the existence of spacetime singularities: regions where classical physics breaks down, such as the interior of black holes. A key question is whether these singularities are resolved by new physics, and if such new physics can leave observable imprints outside the black hole horizon.

In this talk, I will address this question using a phenomenological model in which short-distance modifications smooth out spacetime singularities. Although such modifications occur at microscopic scales, I will describe three observational settings where black hole observables can be sensitive to such small deviations.

First, gravitational microlensing events with small source angles probe the near-horizon geometry. Second, X-ray emission from matter orbiting close to the black hole can produce characteristic spectral features. Third, black holes formed in the early universe evolve over cosmic timescales, allowing small deviations to accumulate and potentially contribute to dark matter.

Last, I will argue that black holes provide a promising and exciting arena to search for signatures of new physics.



Der Vortrag findet **am Freitag, den 30. Januar 2026 um 15:45 Uhr im Otto-Lehmann-Hörsaal**, Physik-Flachbau (Geb. 30.22), KIT-Campus Süd statt.