



EINLADUNG

im Rahmen des Literaturseminars

zum Vortrag von

Felix WILLENBORG

(University of Bremen)

über

“Wave optical image formation of exact scalar wave scattering in Kerr-de Sitter spacetime“

Abstract:

Linear perturbations of black holes have been discussed widely in many contexts. Of interest are properties such as differential cross-sections or quasi-normal modes. A useful tool in this respect is the Newman-Penrose formalism and the resulting Teukolsky equations, giving separated angular and radial differential equations. These were mostly evaluated by numerical means or in approximations. However, the introduction of a cosmological constant allows the problem to be solved in an exact analytical manner by transforming the differential equations into the Heun differential equation, the most general second-order differential equation with four regular singularities. We show for the Kerr-de Sitter spacetime that scattering of waves from a point source needs an additional discussion around the so-called Heun's function, which enables a then possible normalization of the angular solution, similarly to the case of spherical harmonics. We assume in the discussion and analysis a scalar source star of fixed frequency and solve the scattering problem by a partial wave sum. The observed wave optical image formation by means of Kirchhoff-Fresnel diffraction and the resulting shadow will be compared to e.g. the ray-optical black hole shadow.

Zeit: Dienstag, 16.4.2024, 13:00h

Ort: Seminarraum A, Währinger Straße 17, 2. Stock

<https://univienne.zoom.us/j/6540036841?pwd=SytyVkZJZzNyRG9IMm13ejlHeHRRUT09>