Contribution ID: **5** Type: **not specified**

A Hamiltonian approach to Schwarzschild master functions

Friday 24 October 2025 17:40 (20 minutes)

The study of black hole perturbations is essential for understanding the final stages of compact object mergers. In this talk, we will explore perturbations of the Schwarzschild model from a different perspective: the Hamiltonian formalism, in contrast with the commonly used Lagrangian approach. This framework not only reproduces the well-known dynamical results but also sheds new light on the phase-space structure and the symmetries of polar and axial modes. Moreover, it provides a unified treatment of both the interior and exterior of the black hole, while offering a more direct path toward a quantum analysis of these perturbations.

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Session Classification: Contributed talks