



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study : Ph.D.

Thesis Title: Relativistic Accretion Flows Around Rotating Black Holes: Effects of Viscosity, Thermal Conduction, and Magnetic Fields

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SHORT ABSTRACT

The comprehensive analysis presented in this thesis significantly advances the understanding of the physics governing relativistic accretion flows onto black holes. This thesis investigates hot, relativistic, viscous, and magnetized accretion flows around rotating black holes, focusing on how viscosity, thermal conduction, and magnetic fields governs the flow properties, controlling the thermodynamics and radiative signatures of accreting black hole systems. The transonic properties of the flow are regulated by the by the radially varying viscosity, and modifies the critical points. Thermal conduction transfers the heat from the inner region of the flow to the outer region and thermodynamics properties of the flow gets altered and hence the luminosity and spectral energy distribution. Furthermore, magnetic field plays a vital role in transport of the angular momentum and synchrotron emission process. Overall, the thesis presents a framework for understanding the various aspects of relativistic accretion flows.