

1059-83-189

Harald P Pfeiffer* (pfeiffer@cita.utoronto.ca), Cdn. Institute for Theoretical Astrophysics, University of Toronto, 60 St. George Street, Toronto, ON M5S 3H8, Canada. *Black hole simulations using spectral methods.*

Einstein's equations of General Relativity have several challenging properties that need to be overcome for numerical solutions, among them the existence of constraints, the freedom to choose coordinates, and the presence of singularities inside black hole horizons. Nevertheless, remarkable progress has been achieved over the last years that now allows to study binary black hole systems. This talk reviews some basic properties of Einstein's equations, describes the numerical implementation with a multi-domain pseudo-spectral collocation method, and presents some recent results for binary black hole systems. (Received February 23, 2010)