Insights into the rotating black hole interior from numerical solutions

The last couple of decades has seen tremendous progress in numerical solution of the Einstein field equations for regions of spacetime exterior to black hole horizons. For reasons I will briefly discuss, the corresponding advances have not been of much help for the problem of the black hole interior, in particular for black holes formed from gravitational collapse outside of spherical symmetry.

We are thus still left having to appeal to simplified scenarios to try to gain some insight into this problem. In that regard, I will present results form numerical studies of rotating black holes formed from scalar field collapse in asymptotically Anti de-Sitter spacetime, in 2+1 dimensions, with circular symmetry imposed. Despite the simplicity of this model, the interior exhibits rich phenomenology that I will describe in the talk.