Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Geometry near the Inner Horizon of a Rotating, Accreting Black Hole TYLER MCMAKEN, ANDREW HAMILTON, University of Colorado, Boulder — What will an observer see after falling within an astrophysically realistic black hole? Here we present a novel classical model to describe the near-inner horizon geometry of a rotating, accreting black hole. The model assumes spacetime is homogeneous and is sourced by radial streams of a collisionless, null fluid, and it predicts that the standard Poisson-Israel mass inflation phenomenon will be interrupted by a Kasner-like collapse toward a spacelike singularity. By connecting this model to the Kerr metric in a regime where both are valid, we show that an infalling observer will meet their end near the inner horizon after passing through two epochs of spacetime evolution. The simplicity of the model also gives the potential for future calculations of the quantum backreaction to the metric.

Tyler McMaken
University of Colorado, Boulder

Date submitted: 07 Jan 2021 Electronic form version 1.4