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Gravitational-Wave Versus X-Ray Tests of Strong-Field Gravity¹ ALEJANDRO CARDENAS-AVENDANO, Department of Physics, University of Illinois at Urbana-Champaign, Urbana, IL 61801, USA and Programa de Matemática; Fundación Universitaria Konra, SOURABH NAMPALLIWAR, Theoretical Astrophysics, Eberhard-Karls Universität Tübingen, Auf der Morgenstelle 10, 72076 Tübingen, Germany, NICOLAS YUNES, Department of Physics, University of Illinois at Urbana-Champaign, Urbana, IL 61801, USA — Electromagnetic observations of the radiation emitted by an accretion disk around a black hole, as well as gravitational-wave observations of coalescing binaries, can be used to probe strong-field gravity. In this talk, I will compare the constraints that these two types of observations can impose on theory-agnostic, parametric deviations from the Schwarzschild metric. I will show that current gravitational wave observations have already placed constraints on the metric deformation parameters than are slightly more stringent than what can be achieved with X-ray instruments in the near future. Moreover, I will show that future gravitational wave observations with aLIGO at design sensitivity by 2026 will be even more stringent, in particular becoming stronger that constraints achievable with future ATHENA X-ray observations in 2034.

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