

**University of Wisconsin-Milwaukee**

**Dept. of Physics  
COLLOQUIUM**

*CSI Gravity: Investigating Mysteries  
of Fundamental Physics with Black Holes*

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UIUC

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**Friday, 23 February 2024**

**3:30 PM (start)      KIRC 1150**

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Black holes are among the most exciting predictions of Einstein's theory of general relativity, composed of the fabric of spacetime itself. Observations of black holes offer unique access to extreme gravity, and they enable us to investigate long-standing puzzles in fundamental physics ranging from dark matter to the very nature of gravity itself.

In my presentation, I will first provide an overview of recent black hole observations, including gravitational wave detections. I will then discuss how we produce theoretical models of black hole mergers and gravitational waves using numerical relativity, that are needed to correctly interpret the observations. I will conclude with a taster on how we can use numerical relativity simulations to learn about the nature of gravity or new (axionlike) particles.

