

Thursday January 30, 2025

Refreshments at 3:15PM outside PSF 101
Colloquium from 3:30PM – 4:30PM in PSF 101

Quantum Black Holes and the Conundrum of Cosmic Causality

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Abstract:

How does causality work in a quantum spacetime? Is it merely a coincidence that whenever we require quantum gravity to understand phenomena—such as black hole evaporation or the Big Bang—we also encounter causal paradoxes like the black hole information paradox or the cosmological horizon problem? I will explore what we can learn about causality from studying quantum black holes and how these findings could guide us on the roadmap to discovery in future astronomical observations.

Biography:

Niayesh Afshordi, a Princeton PhD and full professor of Physics and Astronomy at the University of Waterloo with a joint appointment at the Perimeter Institute, is a researcher in fundamental physics, astrophysics, and cosmology. His work has advanced quantum models of black holes, the big bang, and dark energy, with applications extending into gravitational wave and cosmological observations. Recently, he has applied his expertise to COVID-19 modeling and public health policy, while also pioneering interdisciplinary collaborations exploring quantum spacetime with philosophers, physicists, and astronomers. Afshordi is an active science communicator, with widely viewed video contributions and an upcoming popular science book, *Battle of the Big Bang*, set for release by the University of Chicago Press. His accolades include the NSERC Discovery Accelerator Supplement, Ontario's Early Researcher Award, the Vainu Bappu Gold Medal, and awards from the Buchalter Cosmology Prize."