

# Physics & Astronomy Colloquium

## Presents



## Aaron Vincent

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Thursday, October 15, 2020  
4:10 pm via Zoom

*Meet the speaker at 3:10 pm, join us in welcoming  
the speaker and for an informal chat!*

## “Very small black holes at very large experiments”

Why is gravity so much weaker than the other fundamental forces? Theories of large extra dimensions (LEDs) propose a possible answer, and lead to an intriguing prediction: that high-energy collisions like those at the Large Hadron Collider (LHC) can produce microscopic black holes. This requires ever-higher energies, and going beyond the LHC's 14 TeV reach will take decades. Rather than wait, we can let nature do the work for us: the next generation of neutrino telescopes such as IceCube Gen-2 and P-ONE will see neutrinos with EeV ( $10^{18}$  electronvolt) energies. I will describe how these cubic-km-scale neutrino observatories work, and how they can detect black holes smaller than a nucleus. Finally, I will discuss a possible connection between these black holes and the elusive cosmological dark matter.

*Host: Dr. Guy Worthey*

Meeting ID: 910 6707 5085 • Passcode: PhysAstro