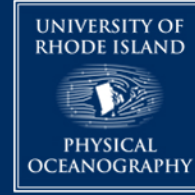
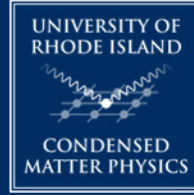
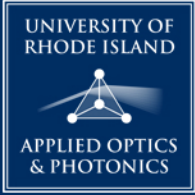


# THE UNIVERSITY OF RHODE ISLAND

## DEPARTMENT OF PHYSICS



**You are invited to join us for a talk as part of our semester colloquium series**

**Presenter:** Sarah Croke (University of Glasgow)

**Date & Time:** Friday February 23, 2024  
4:00 - 4:50 PM

**Location:** East Hall Room 112

**Title:** Exploring quantum algorithms for gravitational wave astronomy

**Abstract:**

The first direct detection of gravitational waves, ripples in spacetime, occurred just a few years ago in 2015, opening up a new window on the Universe. In the short time since then, detections of certain classes of sources have become routine, however weaker signals remain difficult to detect in noisy data. The data analysis required for detection and analysis of source parameters is extremely computationally intensive, and the sensitivity of searches for certain classes of signals (e.g. continuous wave sources) is currently computationally limited.

In this talk I will describe some of our recent work exploring the potential of quantum algorithms to find applications in gravitational wave astronomy. I will outline the data analysis tasks of interest, and highlight features relevant to designing quantum algorithms. As examples, I will introduce matched filtering as an application of Grover's algorithm, and discuss state preparation routines for loading simulated gravitational wave data into a quantum processor.



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