

“Glass Wires, Magic Crystals, and Special Nothing: The Technology Behind Gravitational Wave Detection”

Dr. Jax Sanders

Marquette University

Monday, April 1st, 2024 at 4:00pm

Hammond Auditorium (Engineering 120)

Abstract

The groundbreaking detection of gravitational waves has given us a new perspective on the universe allowing for precise tests of general relativity, rewriting our understanding of the origins of heavy elements, and turning the detection of binary black hole collisions from revolutionary to routine. All of these scientific advances depend on technical developments in laser interferometry allowing for measurements of change smaller than the width of an atom. This talk will give an introduction to the technology that enables gravitational wave detection and discuss the improvements made going into the current O4 observing run. We will discuss important open questions in multimessenger science, and the role of instrumental research and development in answering them. Finally, we will look to the future of gravitational wave detectors and the scientific promise of our multimessenger future.

Biography

Dr. Jax Sanders (they/them) is an assistant professor in the department of physics at Marquette University. They started working on gravitational wave hardware as a summer research student at LIGO Hanford Observatory, and returned there as a graduate student at University of Michigan to commission the sensing and control system for the first version of the Advanced LIGO interferometers. After a postdoc at Syracuse University, working on future interferometer designs and sensing and control technology, they started their own group at Marquette University, where they develop new sensors and actuators for gravitational wave detectors, design conceptual detector configurations for studying astrophysical problems, and help direct the LIGO-Virgo-KAGRA Collaboration as part of the program committee.