

Thursday, January 18, 2023

Refreshments at 3:15pm in PSF 101

Colloquium from 3:30pm - 4:30pm outside PSF 101

Mapping the Universe with 21cm Intensity Mapping

Professor Simon Foreman

Arizona State University



Abstract:

Our knowledge of the universe has grown by leaps and bounds over the last several decades, but many fundamental questions remain unanswered, from the behavior of the very early universe to the identities of dark matter and dark energy. Proposed solutions to these open problems can be tested via their impact on the large-scale distribution of matter in the universe. In this talk, I will discuss 21cm intensity mapping, a technique for mapping this distribution by measuring radiation from spin-flip transitions in distant clouds of neutral hydrogen. In particular, I will discuss recent cosmology results from the CHIME telescope (which was custom-built for intensity mapping), along with progress toward the next generation of measurements and new tools for interpreting these measurements. Collectively, these developments will set the stage for 21cm intensity mapping to provide exciting information about cosmology in the years to come.

Biography:

Simon Foreman's research is motivated by the potential for cosmological measurements to provide new insights into the fundamental constituents of nature. His work spans theory, simulations, and data analysis, and in addition to his current primary focus on 21cm intensity mapping, has included topics such as gravitational lensing, the cosmic microwave background, and an effective field theory-based approach to cosmological perturbation theory. Simon received his Ph.D. from Stanford University in 2016, and previously held postdoctoral fellowships at the Canadian Institute for Theoretical Astrophysics, the Perimeter Institute for Theoretical Physics, and MIT.

Host: Prof. Cindy Keeler

View our Spring 2024 Physics Colloquium schedule at <https://physics.asu.edu/colloquia>