Toward a scalable framework for evaluation of potential Cosmic Explorer sites

Tooba Ansar
Mentors: Robert Schofield and Michael Landry

Cosmic Explorer is a third-generation gravitational-wave observatory concept that will offer an order-of-magnitude improvement in broadband sensitivity over current gravitational-wave observatories. This leap in sensitivity results from Cosmic Explorer's expansive 40-km arms, allowing it to detect gravitational wave sources across the universe that remain unresolved by existing detectors. In developing Cosmic Explorer, it is important to identify sources of ambient noise near potential sites that could limit its high sensitivity, as well as ensure sufficient land clearance for its extensive arm length. In this paper, we propose a method for identifying noise sources and surveying land availability around candidate sites using geographic information systems. With hundreds of suitable locations, we aim to develop a scalable approach for remote evaluation of Cosmic Explorer sites to hone in on those most promising for eventual on-ground testing.