

Bhaumik Luncheon Seminar

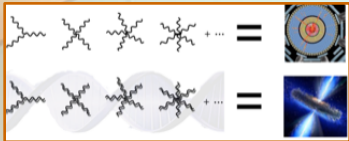
Thursday, February 25th @ 12PM Via Zoom

The Mani L. Bhaumik Institute of Theoretical Physics presents the Winter 2021 Bhaumik Luncheon Seminar. The goal of this Seminar series is to learn about exciting new ideas from scientists in the department and around the world through short talks and discussions. The Seminar is held once per academic quarter. Come participate and enjoy a light lunch.



Andres Luna Godoy, UCLA “Amplitudes: from LHC to LISA”

The scattering amplitude encodes the dynamics of interacting particles. The need for precision in computations for particle accelerators has driven a development of techniques to compute amplitudes, which have reached as far as black hole dynamics. In this talk, I will briefly describe why, and how are we trying to apply quantum field theory methods to the problem of a binary of black holes, and its gravitational wave emission.



Credit: JJ Carrasco

Ziqi Pi, UCLA

“Cell-free action potentials as a dynamical system”

Action potentials, voltage spikes in the neuron, play an essential role in biological communication. This unique analog/digital dynamical system has been the subject of extensive study, yet until recently action potentials have not been generated outside the living cell. By constructing a dressed down system using only the essential biological components (lipid membrane, voltage gated ion channels, and an ionic gradient), we are able to generate and regulate action potentials in vitro. The system is modeled using a mean field approach to explore the critical behavior near the voltage threshold for firing, and we demonstrate scaling and determine a scaling exponent. The universality of properties near a critical point allows this simplified synthetic neuron to produce much of the same dynamics as real neurons.

