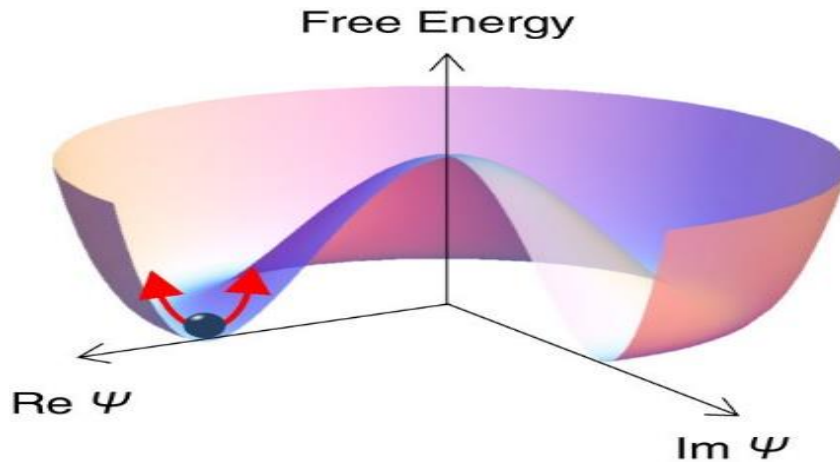


# COLLOQUIUM



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## The Higgs boson in superfluids and superconductors

### Abstract

The celebrated Higgs boson in particle physics, a cornerstone of the Standard Model of elementary particles, has a very fascinating analogue in the realm of condensed matter physics: the oscillations of the amplitude of the order parameter of a superfluid or a superconductor. Starting from basic Physics, in the colloquium I will present the crucial notion of an order parameter, with particular focus on superfluids and superconductors, where the order parameter is a quantum wave function, just like an atomic orbital, which describes the collective motion of the system. I will discuss the historical search for the Higgs boson in condensed matter physics, and I will stress the importance of computer simulations in order to have a clean detection of such a dynamical mode starting from the basic laws of quantum mechanics. Finally, I will discuss the progress that we are making at Fresno State, where my group is actively searching for the Higgs particle in atomic physics.

<https://fresnostate.zoom.us/j/86876409409?pwd=VEhTMk05ZEJmbUtQcThMNDVnQURZZz09>

3:00 p.m. – 4:00 pm Friday, February 26<sup>th</sup> Virtual