

Experimental Techniques for Exploring the BEC-BCS Crossover

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The BEC-BCS crossover in ultracold Fermi gases offers a unique platform for exploring strongly correlated quantum systems in a highly controlled environment. This workshop will provide a comprehensive overview of the experimental techniques used to realize and probe this crossover.

The first session will focus on the experimental platform required to study fermionic pairing. Topics will include the cooling and trapping of fermionic atoms, the control of interatomic interactions using Feshbach resonances, and common detection techniques such as RF and Bragg spectroscopy for investigating pairing mechanisms.

The second session will explore the study of collective excitations across the crossover. We will discuss methods for exciting and measuring collective modes, and how their dynamical evolution reveals key properties of fermionic superfluids.

This workshop is intended for PhD students with a background in cold atom physics and will complement the theoretical lectures with a practical, experiment-focused perspective.