

SCATTERING THEORY FOR EXPERIMENTALISTS

PRESENTED BY RYAN THOMAS – 18 NOVEMBER 2016, 12PM

In ultracold atomic physics, scattering theory reigns supreme. It turns complicated interactions into a small set of numbers, possibly tuned via external fields, which can be used to engineer novel quantum systems and account for observed effects. But how does it work? How does one theoretically understand – and calculate numbers for – the ubiquitous scattering problem?

In this talk, I will give an introduction to multichannel scattering theory aimed at experimentalists; i.e. those who have a passing familiarity with single channel scattering theory, but have not taken the time to dive into multichannel problems. We will cover single channel scattering theory, scattering of particles with spin, and non-degenerate internal states and how these apply to the collisions of alkali metal atoms. One potential method for solving the multichannel scattering problem will finish the talk. As the goal of this talk will be to enable one to actually calculate something useful about a system in the lab, mathematical abstraction will be kept to a minimum.