

## MCTDHX: A unified numerical software for bosons and fermions

This Lab Session teaches the workflow and usage of the MCTDH-X software hosted at <http://ultracold.org> . In a hands-on session we will do a tutorial to learn the general structure of the program and its capabilities. For this purpose, we will deal with concrete and basic examples. We will show how to use MCTDH-X to solve the time-dependent as well as the time-independent many-particle Schrödinger equation for bosons or fermions. In the first session we will simulate interacting particles moving in a potential and find the probability distributions, energies, and (natural) occupations of the system. In the second session we will discover analysis tools that handle more advanced tasks like finding correlation functions and more. Perspectives for real-life and current hot research topics in AMO physics will be discussed. If necessary, assistance to install the MCTDH-X software will be provided.

Supporting material can be found in <http://ultracold.org> .