

In this interactive seminar we present a new open-source Python 2.7 package for quantum dynamics of spin chains based on exact diagonalisation, called $\mathcal{Q}^{\text{u}}\text{Spj}\mathcal{N}$. The package is well-suited to study, among others, quantum quenches at finite and infinite times, the Eigenstate Thermalisation hypothesis, many-body localisation and other dynamical phase transitions, periodically-driven (Floquet) systems, adiabatic and counter-diabatic ramps, and spin-photon interactions. In this interactive seminar we explain how to use $\mathcal{Q}^{\text{u}}\text{Spj}\mathcal{N}$ using three detailed examples: (i) adiabatic ramping of parameters in the many-body localised Heisenberg model, (ii) heating in the periodically-driven transverse-field Ising model in a parallel field, and (iii) quantised light-atom interactions: recovering the periodically-driven atom in the semi-classical limit of a static Hamiltonian. because this will be an interactive seminar we ask the participants to bring their laptop computers in order to install $\mathcal{Q}^{\text{u}}\text{Spj}\mathcal{N}$ and run the example code provided. For first time users of Python we recommend that you install Anaconda for Python 2.7 on your computer before the seminar begins. It can be downloaded at <https://www.continuum.io/downloads>.