Project Title and Schedule

Project Specificiaton

Title: Simulation of the time evolution of a small quantum subsystem coupled to a quantum bath.

We aim to understand and model the behaviour of a simplified quantum system as it thermalises. We will investigate the behaviour of a spin-1/2 system using a computer simulation. The Eigenstate thermalization hypothesis (ETH) states that for a system prepared in some initial state where the expectation value of an observable $\hat{O}$ is far from that given by the microcanonical ensemble of this system, the expectation value of $\hat{O}$ will ultimately evolve in time to its value predicted by a microcanonical ensemble, without the invocation of any random processes. We shall simulate non-equlibrium quantum systems consisting of a several spin system coupled to a large bath and demonstrate this process.

Schedule

28/10/16	Project title and Schedule agreed
21/11/16	Physics mostly understood and modelling commencing
06/02/17	Draft project report completed

Supervisor signature

Student signature