

PhD position in the group of Dr. Arijeet Pal (UCL)

A PhD studentship in condensed matter theory is available at University College London in the Department of Physics & Astronomy starting October 2020. The group's research has synergies with the local research milieu of UCLQ Quantum Science and Technology Institute and London Centre for Nanotechnology. The studentship includes a stipend and tuition fees for 4 years.

Supervisor Name: Dr. Arijeet Pal

Supervisor Email: a.pal@ucl.ac.uk

Project: Correlated non-equilibrium quantum matter

Project Description: The dynamics of interacting quantum systems host a variety of fascinating phenomena. Recent developments include new non-equilibrium phases of matter characterised by many-body localization and time-crystallinity. In these phases of matter laws of equilibrium thermodynamics cease to apply, thereby exhibiting macroscopic quantum behaviour in highly excited states. These have opened the door for investigating quantum many body physics in an entirely new regime away from zero temperature. Furthermore, recent experimental progress in quantum control of solid state systems (NV centres, quantum dots) and synthetic quantum systems (cold atoms, trapped ions) has allowed exploration of these questions in the laboratory.

This project aims to study the properties of many-body localisation and time-crystallinity. Focus would be on long-range interacting systems and the effects of external environment. The work is related to a European Research Council funded project in the group on the same subject. The candidate will be expected to be well-versed with the concepts and tools of quantum many-body physics and quantum information science. The project will involve applying both analytical and numerical methods. Therefore, a strong background in condensed matter theory and quantum many-body physics will be preferred. There is also scope for collaboration with experimental groups at UCL studying quantum dynamics.

For further details on the research in the group refer to the group webpage (<https://arijeet1.wixsite.com/arijeetpal>).

The Candidate

Applicants should have (or expect by September 2020) at least a 2.1 MSci (or the equivalent from a non-UK university) in physics. They will demonstrate strong interest and self-motivation in the subject, good analytical and computational skills, and ability to think critically and creatively.

Application Procedure

Please send a CV (including a list of courses taken and marks obtained), a research statement (2-3 pages) and 3 letters of recommendation to Dr. Arijeet Pal (a.pal@ucl.ac.uk) The review of applications will begin from the 12th of January 2020 until the position is filled. For applicants outside UK or EEA the deadline is 5th January 2020. For further enquiries and other details please contact Dr. Arijeet Pal (a.pal@ucl.ac.uk).