Candidate Information

Position:	Research Fellow
School/Department:	School of Mathematics and Physics
Reference:	21/109179
Closing Date:	Friday 24 September 2021
Salary:	£34,304 per annum
Anticipated Interview Date:	Monday 4 October 2021
Duration:	18 months (available until 30th June 2023)

JOB PURPOSE:

To be a highly productive, ambitious and collaborative member of "Quantum Many-Body Engines" (https://gow.epsrc.ukri.org/NGBOViewGrant.aspx?GrantRef=EP/S02994X/1) research project/team assisting in the development of research proposals and the planning and delivery of the research activity. Specifically, the role, funded by an EPSRC grant, will undertake theoretical research on Quantum Thermodynamics. The project will be conducted in collaboration with experimental groups working on ultracold atomic setups with the aim of designing and realising experimentally quantum thermodynamic machines.
The post is a critical role, and as such, successful applicants will have responsibilities in independent research, supervision, planning, collaborations, and outreach.

MAJOR DUTIES:

1. Undertake research under supervision within the research project and as a member of a research team.
2. Design, develop and refine research using a range of experimental models. Specifically, the design of experimentally feasible thermal engines and refrigerators made of many interacting particles and operating coherently in the quantum regime. These goals will be achieved in collaboration with experimental groups working on ultracold atomic setups.
3. Carry out analyses, critical evaluations, and interpretations of experimental data and the literature using methodologies and other techniques appropriate to area of research.
4. Produce high quality research outputs consistent with project aims and commensurate with career stage. This will include collaborating and co-authoring with PI and project team (as appropriate) on outputs.
5. In consultation with the project team, promote research milestones and outputs at national and international conferences.
6. Assist grant holder in the preparation of funding proposals and applications to external bodies.
7. Carry out occasional educational supervision, demonstrating or lecturing duties within the post holder's area of expertise and under the direct guidance of a member of academic staff.
8. Undertake supplementary duties relevant to the success of the project including administrative duties and additional training and development activities as required.

Planning and Organising:

1. Plan own day-to day activity within framework of the agreed research programme.
2. Contribute to the planning of research project, reports and publications etc.
3. Assist PI and project team in organising relevant events.

Resource Management Responsibilities:

1. Ensure research resources are used in an effective and efficient manner.
2. Provide guidance, as required, to ensure a safe working environment.

Internal and External Relationships:

1. Liaise on a regular basis with members of the project team.
2. Liaise on a regular basis with project partners.
3. Build contacts with relevant stakeholders to form relationships for future collaboration and project dissemination.

ESSENTIAL CRITERIA:

1. Normally have or be about to obtain a PhD in physics.
2. At least 3 years relevant research experience to include:
   - Undertaking research in theoretical physics (including postgraduate level).
   - A proven track record of designing microscopic models to carry out analyses, critical evaluations.
   - Working effectively as part of a research team in the development and promotion of the research theme.
3. Practical problem-solving skills, independence of thought and initiative.
4. Ability to communicate complex information in English effectively in oral and written format.
5. Ability to build relationships to develop internal and external networks.
6. Commitment to continuous professional development.

DESIRABLE CRITERIA:

1. PhD in Theoretical Physics in one or more of the areas of Quantum Thermodynamics, Quantum Optics, Ultracold Atoms, Open Quantum Systems, Quantum Information Processing.
2. Provable theoretical research experience in one or more of the following areas:
   - Quantum Thermodynamics
   - Quantum Optics.
   - Ultracold Atoms
   - Quantum Information Processing.
   - Open Quantum Systems.
3. A substantial number of high-quality publications in international peer-reviewed journals (commensurate with the research experience).
4. Ability to contribute to broader management and administrative processes.
5. Contribute to the School’s outreach programme by links with industry, community groups etc.
6. Numerical analysis/simulation skills (quantum optics/open systems tool-box, machine learning, tensor networks).
7. Ability to assess and organise resources.