

Candidate Information

Position: Research Fellow
School/Department: School of Mathematics and Physics
Reference: 26/113429
Closing Date: Monday 22 June 2026
Salary: £41,519 - £49,536 per annum
Anticipated Interview Date: Monday 6 July 2026
Duration: Available for 5 months or until 31/12/2026 whichever is soonest.

JOB PURPOSE:

The Centre for Quantum Materials Technologies (CQMT) at Queen's University Belfast is seeking a postdoctoral researcher as part of a project that will help unveil transitional states in an antiferroelectric material with strong implications for energy storage. (project ref: https://www.nsf.gov/awardsearch/showAward?AWD_ID=2219476&HistoricalAwards=false).

The position will assume responsibility for the delivery of specific research objectives as part of a continuing US-Ireland research project, held by the PI. The appointee will work within the PI's team alongside PhD students as well as members of other groups associated with the world-class nanoscale ferroelectrics activity in the Centre. The planned research will be pursued at a fundamental level and will be heavily experimentally focussed.

MAJOR DUTIES:

1. Undertake research under supervision within the specific research project, and as a member of the PIs research team to investigate transitional states in antiferroelectric thin films of lead Zirconate and Lead Hafnate.
2. Undertake atomic scale characterisation and polarisation mapping to establish the nature of antiferroelectricity in thin films.
3. As part of the project, investigate the structure-property relations in processed films.
4. Undertake in-situ biasing experiments on the thin films to determine true antiferroelectric behaviour in processed films.
5. Carry out data analysis and critical evaluations to correlate parallel studies with TEM experiments.
6. Ability and willingness to develop/build upon existing Transmission Electron Microscopy infrastructure.
7. 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.
8. In consultation with the project team, promote research milestones and outputs at national and international conferences.
9. Carry out undergraduate supervision/demonstrating/teaching duties at a level to be agreed, and to assist with project-related outreach activities as required.
10. Undertake supplementary duties relevant to the success of the project including administrative duties and additional training and development activities as required.

ESSENTIAL CRITERIA:

1. Degree or equivalent in physics, materials science or other cognate area of relevance to the post.
2. Hold or about to obtain a PhD in a relevant area (e.g. Physics, Materials Science).
3. Significant relevant experience in electron microscopy applied to materials characterisation, using following techniques: high-resolution TEM imaging (HRTEM), Electron Diffraction, bright/dark field imaging, scanning transmission electron microscopy (STEM), Energy-dispersive X-ray spectroscopy (EDS) and Electron Energy Loss Spectroscopy (EELS).
4. Experience in Ferroelectric/antiferroelectric Physics and Domain/Domain wall Phenomena with emphasis on polarisation mapping.
5. Experience in FIB techniques including in-situ and ex-situ lamella lift-out sample preparation.
6. Experience operating in-situ TEM holders (e.g. heat, bias) and ability to carry out dynamic TEM experiments.
7. Relevant data analysis for High resolution TEM techniques.
8. Ability to contribute to broader management and administrative processes.

9. Demonstratable teaching experience to undergraduate Physics students.
10. Sufficient breadth and depth of specialist knowledge in the discipline and of research methods/techniques to work within established research programmes.
11. Ability to communicate complex information in English effectively in oral and written format.

DESIRABLE CRITERIA:

1. Relevant PhD research experience in High Resolution Transmission electron microscopy of ferroelectrics, functional oxides and/or domain walls.
2. Experience in additional characterisation techniques such as SEM, EBSD and SPM.
3. Experience in mechanical TEM sample preparation techniques: mechanical polishing, dimple grinding, usage of PIPS etc.
4. Experience in sample preparation for in-situ biasing experiments using TEM on Ferroelectrics.
5. Experience gaining access and carrying out TEM experiments in advanced user facilities such as SuperSTEM, UK or ER-C, Juelich.
6. Experience in training students/other users on electron microscopes.
7. Dissemination/publication record commensurate with level of experience.
8. Contribute to the School's outreach programme by links with industry, community groups etc.
9. Excellent Teaching evaluation scores in taught modules.
10. Practical problem solving skills, independence of thought and initiative.
11. Ability to work as part of a team (and be part of collaborations on satellite projects), as well as independently.
12. Ability to articulate microscopy data to collaborators working on an international project and experience publishing high-level electron microscopy data.
13. Ability to prepare and give well-timed, coherent and insightful presentations.
14. Contributed talks at international and local conferences.
15. Strongly motivated, able to work independently and take ownership of the project.
16. Able to work as part of a team and assist with day-to-day management and mentoring of PhD students.
17. Willingness to be involved in school initiatives such as Athena-Swann, Outreach events, etc.
18. Willingness to travel both nationally and internationally as required by the role.