Candidate Information

Position:	Research Fellow
School/Department:	School of Mathematics and Physics
Reference:	26/113257
Closing Date:	Monday 11 May 2026
Salary:	£41,519 - £49,536 per annum
Anticipated Interview Date:	Thursday 21 May 2026
Duration:	Available for 36 months or until 31 May 2029 whichever is soonest

JOB PURPOSE:

To be a highly productive, ambitious and collaborative member of the Polarisation- driven surface chemistry on free-standing ferroelectrics research project.

The post holder will contribute to the design and delivery of advanced experimental research, with a focus on in-situ Transmission Electron Microscopy (TEM) of functional oxide materials under controlled environmental conditions (e.g., gas and temperature)

The role will investigate how ferroelectric polarisation couples with surface chemistry and external stimuli (e.g. gas, temperature, and electric fields) using state-of-the-art microscopy and correlative techniques

This position provides an exciting opportunity to develop expertise and independence in advanced in-situ TEM methods, working within a collaborative UK–Ireland partnership and contributing to challenges in clean energy and sustainable materials.

The post holder will contribute to independent research, supervision, planning, collaborations, and outreach.

The post holder will benefit from:

• Experience in advanced in-situ microscopy techniques
• Opportunities to develop independent research ideas and fellowship applications
• Access to interdisciplinary collaboration across experiment and modelling

MAJOR DUTIES:

1. Undertake independent and collaborative research within the project, using Transmission Electron Microscopy (TEM) techniques to study nanoscale structure and dynamics in functional materials (ferroelectrics).
2. Develop and perform in-situ TEM experiments, including heating, environmental (gas), and electrical biasing studies. Training in specific in-situ techniques will be provided where required.
3. Design and carry out experiments using a range of techniques, which may include:
   - TEM/STEM imaging and diffraction
   – Spectroscopy (e.g. EDX, EELS)
   – Sample preparation (e.g. FIB, MEMS-based platforms)
4. Analyse and interpret experimental data, including correlative methods (e.g. scanning probe microscopy, XPS) or multidimensional datasets, and relate findings to underlying physical mechanisms.
5. Produce high-quality research outputs (publications, reports) and contribute to dissemination at international conferences (e.g. MRS, ISAF, APS) and through appropriate dissemination channels.
6. Assist in the preparation of research proposals and applications for beamtime or facility access, where appropriate.
7. Support the supervision and training of postgraduate and undergraduate students.
8. 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.

9. Undertake supplementary duties relevant to the success of the project including administrative duties and additional training and development activities as required.

ESSENTIAL CRITERIA:

1. Normally have or be about to obtain a PhD in Materials Science, Physics, Chemistry, Nanoscience, or a closely related discipline, with experience in transmission electron microscopy (TEM) for materials characterisation.
2. Recent relevant research experience to include:
   · Proven experience in transmission electron microscopy (TEM/STEM) techniques for material characterisation, including high resolution imaging, spectroscopy (e.g., EDX) and diffraction.
   · Demonstrated ability to analyse and interpret complex experimental datasets.
   · Experience working effectively as part of a collaborative or interdisciplinary research team
   · Evidence of a strong publication record commensurate with career stage.
3. Ability to contribute to broader management and administrative processes, including:
   · Supporting laboratory organisation and coordination of research activities
   · Contributing to safe working practices in experimental environments
4. Willingness to undertake additional training in research methods and related skills, including advanced microscopy techniques and data analysis methods.
5. Strong practical problem-solving skills in experimental research.
6. Ability to work independently.
7. Ability to communicate complex scientific information effectively in oral and written formats (e.g. publications, presentations).
8. Ability to build relationships and develop internal and external research networks.
9. Ability to assess and organise resources effectively, including time management and prioritisation of experimental work.
10. Highly motivated, with a proactive and collaborative approach.
11. Strong attention to detail and commitment to research quality.

DESIRABLE CRITERIA:

1. Recent relevant research experience to include:
   - Functional oxides and/or ferroelectric materials
   - Experience with focused ion beam (FIB) sample preparation for electron microscopy.
   - In-situ TEM (e.g. heating, environmental, biasing experiments)
   - STEM techniques, such as 4DSTEM, GPA, EELS, and differential phase contrast (DPC).
   - Using national or international research facilities (e.g. electron microscopy centres, synchrotrons).
   - Correlative techniques (e.g. PFM/KPFM, XPS, nano-IR)
   - Data-driven analysis, image processing, or machine learning (e.g. Python, image analysis software)
   - Contributing to grant applications or research proposals
   - Translating research findings into teaching or training materials
2. Recent relevant experience in:
   - Supervising or mentoring students (PhD/MSc/UG)
   - Outreach, public engagement, or equality, diversity and inclusion (EDI) activities
   - Engagement with national facilities or societies (RMS and/or IOP), or international collaborations
3. Ability to work flexibly across disciplines and institutions.
4. Interest in interdisciplinary research.
5. Willingness to work on satellite projects.

ADDITIONAL INFORMATION:

Informal enquiries can be directed to: Miryam Arredondo-Arechavala - m.arredondo@qub.ac.uk