

Development of Multiscale Reference Artefacts for Traceable X-ray Computed Tomography Metrology of Lithium-Ion Battery
EPSRC funded PhD studentship with full fee waiver and £21,805 pa stipend (2026/27 rate)

Project Code: DLA_DTP_2026_13

Main Supervisor: [Professor Paul Scott](#)

Co-Supervisor: [Dr Shan Lou](#), [Professor Dame Jane Jiang](#), [Dr Xiao Chen](#)

Project Introduction

The UK is rapidly expanding domestic lithium-ion battery manufacturing, yet reliable, traceable inspection methods remain underdeveloped. X-ray Computed Tomography (XCT) is widely used to examine internal structures from particle morphology to electrode stacks and cylindrical jelly rolls, but multiscale calibration routes are lacking, limiting measurement confidence and comparability. This PhD will develop battery-mimicking reference artefacts and metrological methods to validate XCT across particle, stack and full-cell geometries. The project will design realistic artefacts, quantify key error sources, and demonstrate industrial relevance through focused case studies to support robust, high-confidence UK battery production.

Project Details

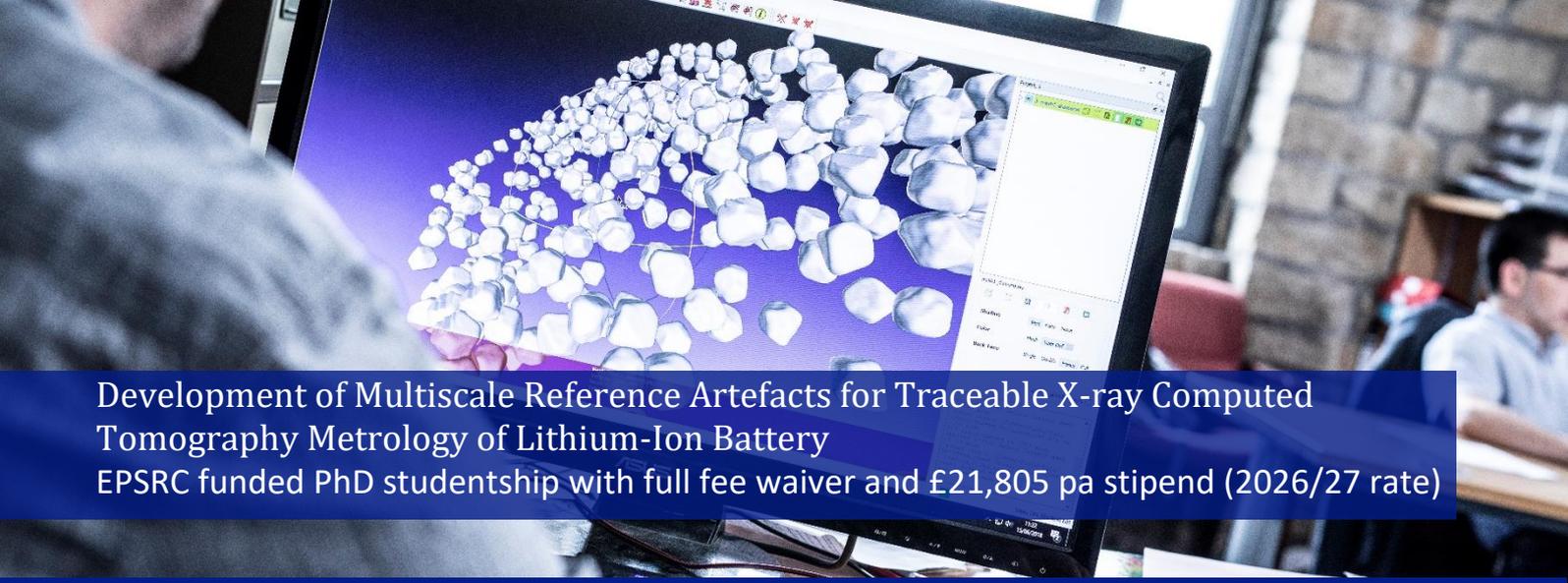
The UK is at a critical stage in developing domestic lithium-ion battery manufacturing, with national analyses warning that limited gigafactory capacity and reliance on foreign supply chains risk UK automotive competitiveness unless domestic capability scales rapidly. As manufacturing capacity grows, high confidence inspection becomes essential; industry increasingly uses X-ray computed tomography (XCT) to assess

internal structures from particle scale morphology to electrode stacks and cylindrical “jelly rolls”, yet traceable calibration routes for such multiscale architectures remain underdeveloped, constraining reliability, comparability and quality assurance across production environments.

This PhD will develop and evaluate multiscale battery mimicking reference artefacts and associated metrological methods to assess the fidelity of XCT measurements across particle, stack and full cell geometries. Building on recent 2D electrode alignment standards, the work extends to volumetric and spiral architectures, using representative materials where appropriate to provide a practical pathway toward application oriented XCT validation that supports UK battery manufacturing. The emphasis is on feasibility and robustness:

- (1) Designing artefacts that encode realistic features, e.g. waviness, z offsets, radial deformation;
- (2) Quantifying key error sources, including surface determination, partial volume, registration;
- (3) Demonstrating industrial relevance through focused case studies, subject to facility availability with relevant partners.

This project will collaborate with the National Physical Laboratory (NPL, UK’s national measurement institute).



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Project-specific entry requirements

- 1) Hold a high-grade qualification, at least the equivalent of a UK First or 2:1 class degree or MSc in engineering or related disciplines
- 2) Be proficient in both written and spoken English, and possess excellent presentation and communication skills
- 3) Experience with XCT or dimensional metrology is advantageous.

Further Information

This call is open to **UK Applicants only**.

Applicants should be of outstanding quality and exceptionally motivated.

The studentships are funded for 3 years (subject to satisfactory annual performance and progression review) and will provide for tuition fees and a tax-free stipend paid monthly.

Please note that there are more projects than funded studentships available and therefore this is a competitive application process which will include an interview. Shortlisted candidates will be contacted for an interview in person or via Teams. After interview the most outstanding applicants will be offered a studentship.

Queries about the application process are welcome and should be emailed to pgrscholarships@hud.ac.uk.

Informal enquiries about this project should be directed to [Professor Paul Scott](#).

Type of Award: Doctor of Philosophy (PhD).

Eligibility: UK applicants only. First Class or Upper Second-Class Honours degree or equivalent in a relevant subject area, please refer to the entry requirements on the specific projects being advertised.

Location: Huddersfield.

Funding: 3 years full time research covering tuition fees and a tax-free bursary (stipend) starting at £21,805 for 2026/27 and increasing in line with the EPSRC guidelines for the subsequent years. Funded via the Engineering and Physical Sciences Research Council Doctoral Training Programme.

Duration: 3 years full-time plus 12 months writing up (please note no funding available for writing up period).

Closing date: 28th April 2026

Start date: 1st October 2026

Application details

- Go to the EPSRC webpage and download the [Expression of Interest Form 2026](#).
- Provide copies of transcripts & certificates of all relevant academic and professional qualifications.
- Provide references from two individuals – please contact your referees and ask them to send them directly to pgrscholarships@hud.ac.uk from their email address.
- Proof of eligibility – e.g. scan of passport photo page.
- Completed forms, including all relevant documents should be submitted via-email to pgrscholarships@hud.ac.uk.

Please note: if you do not attach all the relevant documentation prior to the closing date your application will not be considered.