Second MANIFEST researcher workshop held in London

Date

10.11.2017

Summary

Researchers from across the MANIFEST consortium met at University College London to discuss the available materials characterisation and processing facilities within the institutions and identify how academics could use these for collaborative research.

Full report

A successful second MANIFEST researcher workshop took place at University College London (UCL) on Friday 10th November 2017. There was excellent representation from MANIFEST partners including the University of Birmingham, University of Manchester, Newcastle University, University of Oxford and UCL. The workshop was based on Work Package (WP) 1 (characterization and processing of electrochemical and thermal materials for grid scale storage applications) and the interactions it has with WP2 (multi-scale modelling of energy storage systems) and WP3 (grid scale integration).

The research challenge underpinning this stream of work is that our ability to improve energy storage technologies is limited by our knowledge of their materials and the processes that affect them during times of charging and discharging. Consequently, discussion during the workshop centred on two questions:

Question 1: Can control of nano/micro/macro-structure significantly enhance the performance and lifetime of energy storage devices?

Question 2: How do we predict the behaviour of a storage device based on storage materials properties, and the system level performance based on device level behaviour?

After Omar Saeed (University of Birmingham) gave a general overview of the day, the participants delivered presentations on the available materials characterisation and processing facilities available across the MANIFEST consortium.

Photo 1 - Dami Taiwo (Imperial College London) discusses available materials characterisation and processing facilities at his institution

It was evident from the presentations that within the MANIFEST consortium that there is an enormous suite of facilities that is useful within this research project and for further collaboration on energy storage technologies. Important points raised within the discussion were:

1. The route to accessing facilities is key for MANIFEST to succeed. How do we gain access to the characterisation and processing facilities outlined in the presentations?

2. Whilst it is useful to see the facilities presented in this way, ensuring long-term collaborative equipment sharing/use will be difficult to achieve. How do we store all of the information about materials characterisation and processing facilities in one place?

Omar Saeed explained that there is a piece of ongoing work between the University of Birmingham and Imperial College London to develop an extensive list of equipment and facilities that are of interest to the energy storage community. Once developed, and with internal agreement, the list will made public and will be accessible to anyone within the community, extracting maximum value from these research and capital grants funded facilities.

As the host institution, UCL researchers organised a tour of their facilities in the Electrochemical Innovation Lab (EIL). EIL based research covers understanding of fundamental processes; materials discovery; analytical diagnostics and advanced manufacture; device design and development; modelling, optimisation and life cycle assessment; systems development and demonstration. As well as a large range of equipment, EIL also works in conjunction with UCL Business to act as an incubator, supporting early stage innovations to commercialisation.

Photo 2: Researchers from the University of Oxford and University of Birmingham discuss UCL's facilities with EIL based researcher, Toby Nevile (second from right)

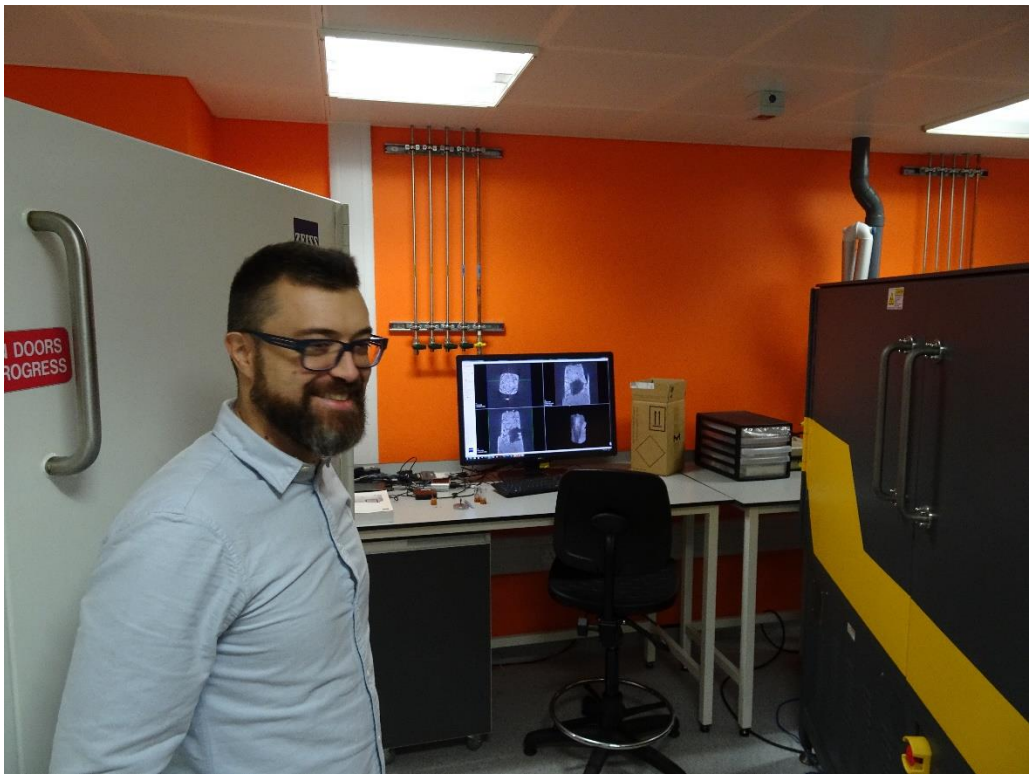

Photo 3: Francesco Iacoviello (UCL) showing some of the facilities based at the EIL

After a well-earned lunch, researchers from the four WP lead institutions (WP1 Imperial, WP2 and WP4 Birmingham and WP4 Manchester) presented WP overviews. The aim of the session was to contextualise the facilities discussed during the morning in the WPs themselves and to generate discussion on the following points:

- How can the different areas (e.g. electrochemical and thermal) work together to achieve desired materials structures?
- Can the different areas work together through investigating degradation?
- Are there specific areas that the MANIFEST consortium should consider in relation to materials characterisation and processing?

The levels of interaction from attendees sparked a number of topics and ideas for further collaboration. Researchers raised a number of interesting points, noted below.

Photo 4: Xiaohui She (Birmingham) presenting a WP2 overview

- Newcastle discussed the possibility of sharing (with Imperial), some of its operational data from energy storage experiments carried out with an industrial partner. This is an opportunity for materials researchers to use performance data from an energy storage device and feed it back into their research to make improvements.
- Manchester and Newcastle spoke about the possibility of Newcastle sharing a battery module with Manchester to facilitate research.
- Materials researchers highlighted that they are interested to see any data from WP3 (grid scale integration) that they could use in their materials research.
- Birmingham and Newcastle highlighted ongoing work around hybridising energy storage assets, specifically as a way to allow shared learning between electrochemical and thermal energy storage technologies.
- Researchers from UCL explained that there is a bank of work within the EIL focused on repeated cycling of batteries, which might be of interest to researchers in WP1 and WP3 going forward.
- Both materials and grid scale researchers suggested that they would like an opportunity to present research to each other in order to share learning in the context of energy storage.

At the end of a long Friday, the group drew up a list of actions to share with project partners and follow up on over the coming weeks and months. Thank you to all of the researchers that travelled to UCL and enthusiastically took part. In particular, thanks go to UCL for hosting, especially Francesco

Iacoviello and Toby Neville who gave a great lab tour. In the meantime, work is already progressing on finalising the agenda for the third MANIFEST researcher workshop, taking place on February 28th at the University of Birmingham. Details to follow very soon.

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