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Engineering and Physical Sciences Research Council

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Details of Grant

EPSRC Reference:	**EP/S023259/1**
Title:	**EPSRC and SFI Centre for Doctoral Training in the Advanced Characterisation of Materials (CDT-ACM)**
Principal Investigator:	**McLachlan, Professor M**
Other Investigators:	**Curson, Professor NJ** **Howard, Professor CA** **Thornton, Professor G** **Duffy, Professor DM** **Porter, Professor AE** **Petit, Professor C** **Stephens, Dr I E L**
Researcher Co-Investigators:	
Project Partners:	**Acutance Scientific Limited** **Agency for Science Technology (A Star)** **Alvatek Ltd** **Asylum Research UK Ltd** **BASF** **Biolin Scientific AB** **BP** **Brookhaven National Laboratory** **Bruker** **Carl Zeiss Ltd (UK)** **Ceres Power Ltd** **CrystalMaker Software Ltd** **Diamond Light Source** **DIAMOND light source Ltd** **European Synch Radiation Facility - ESRF** **FELIX Laboratory** **Gatan, Inc.** **Helmholtz Association** **Hitachi Europe Ltd** **HPNow** **IHP GmbH** **IKZ -Leibniz Institute of Crystal Growth** **Institute Max von Laue - Paul Langevin** **ION-TOF Gmbh** **ISIS** **Japan Adv Inst of Sci & Tech (JAIST)** **JEOL** **Kurt J Lesker Co Ltd** **Kyushu University (Japan)** **Malvern Panalytical Ltd** **Massachusetts Institute of Technology** **Nanyang Technological University** **Oak Ridge National Laboratory** **Paul Scherrer Institute** **Rolls-Royce Plc (UK)** **SABIC (Saudi Basic Industries Corp)** **Semilab Semiconductor Physics Laboratory** **Sensor Coating Systems Ltd** **Smith & Nephew plc (UK)** **Solmates** **Stanford University** **Thermo Fisher Scientific UK** **Toshiba** **Trinity College Dublin** **UK SuperSTEM Laboratory** **University of Stockholm**
Department:	**Materials**
Organisation:	**Imperial College London**
Scheme:	**Centre for Doctoral Training**
Starts:	**01 October 2019**

Starts:	Ends:	Value (£):
01 October 2019	**31 March 2028**	**6,631,929**

EPSRC Research Topic Classifications:	**Biomaterials**	**Magnetism/Magnetic Phenomena**
	Materials Characterisation	

EPSRC Industrial Sector Classifications:	**Electronics**	**Energy**
	Information Technologies	**Transport Systems and Vehicles**
	Water	**R&D**

Related Grants:	

Panel History:	Panel Date	Panel Name		Outcome
	07 Nov 2018	**EPSRC Centres for Doctoral Training Interview Panel J – November 2018**		**Announced**

Summary on Grant Application Form

Materials characterisation is critical to the understanding of key processes in a range of functional and structural materials that have applications across several industrial sectors. These sectors include strategic priorities such as discovery of functional materials, energy storage and conversion and materials manufacturing, and healthcare. Materials characterisation is increasing in complexity, driven by a need to understand how materials properties evolve in operando, over their full lifetimes and over all levels of their hierarchy to predict their ultimate performance. The new generation of materials characterisation techniques will require: 1. Greater spatial and chemical resolution; 2. Correlated information that bridges nano- and centimeter -length scales, to relate the nanoscale chemistry and structure of interest to their intrinsically multi-scale surroundings, and 3. Temporal information about the kinetics of materials behaviour in extreme environments. The CDT will train students in a range of complementary techniques, ensuring that they have the breadth and depth of knowledge to make informed choices when considering key characterisation challenges. Our CDT will use an integrated training approach, to ensure that the technical content is well aligned with the research objectives of each student. This training in specific research needs will be informed by our industry partners and will reflect the suite of research projects that the students will undertake. Our portfolio of research projects will provide an innovative and ambitious research and training experience that will enhance the UK's long-term capabilities across high value industrial sectors.

Additionally, our students will receive training in a range of topics that will support their research progress including in science communication, research ethics, career development planning and data science. These additional courses will be distributed throughout the 4-year PhD programme and will ensure that a cohesive training plan is in place for each student, supported by cohort mentors. Each student graduating from the CDT-ACM will leave will a through understanding of the key challenges presented by materials characterisation problems, and have the tools to provide creative solutions to these. They will have first hand experience of collaborating with industry partners and will be well placed to address the strategic needs of the UK Industrial Strategy.

Our training will be developed in collaboration with leading partner organisations, and include international collaboration with the AMBER centre, a Science Foundation Ireland centre, as well as national facilities such as Diamond Light Source. Innovative on-line and remote instrument access will be developed that will enable both UK and Irish cohorts to interact seamlessly. Industry partners will be closely involved in designing and delivering training activities including at summer schools, and will include entrepreneurship activities.

Overall the 70 students that will be trained over the lifetime of the CDT will receive excellent tuition and research training at two world leading institutions with unique characterisation abilities.

Key Findings

This information can now be found on Gateway to Research (GtR) http://gtr.rcuk.ac.uk

Potential use in non-academic contexts

This information can now be found on Gateway to Research (GtR) http://gtr.rcuk.ac.uk

Impacts

Description	This information can now be found on Gateway to Research (GtR) http://gtr.rcuk.ac.uk
Summary	
Date Materialised	

Sectors submitted by the Researcher

This information can now be found on Gateway to Research (GtR) http://gtr.rcuk.ac.uk

Project URL:	
Further Information:	
Organisation Website:	**http://www.imperial.ac.uk**