

Faculty Doctoral Strategies

Faculty of Mathematical and Physical Sciences – Executive Summary

The Faculty of Mathematical and Physical Sciences (MAPS) at UCL is a unique grouping within British higher education, nurturing excellence in discipline-based research in the natural sciences, alongside expertise in the history and philosophy of science, and its public understanding. The faculty is internationally recognised for the quality and breadth of its research, ranging from leadership at the Large Hadron Collider (LHC), the Dark Energy Survey and major space missions such as Solar Orbiter, through to the renowned London Centre for Nanotechnology. The faculty performs strongly in both pure and applied research, working with industry and generating spin-off companies, and its research also has a direct impact on public policy, both in the UK and abroad.

The faculty's position as a major research powerhouse is supported through a portfolio of research income, currently around £40m per year, and is one of the major winners of grant income from both EPSRC (Engineering & Physical Science Research Council) and STFC (Science & Technology Funding Council), as well as attracting prestigious research fellowships and grants from the Royal Society, the European Research Council (ERC) and other EU funding bodies.

UCL has been at the forefront of promoting the benefits of cross-disciplinary working, notably through its 'Grand Challenges' programme, which addresses major global issues, and the faculty plays a prominent role in these initiatives. We provide a first class environment for doctoral training, not only through world class research facilities but also through the training environment we provide for our students. We host several Doctoral Training Centres, from Number Theory through Materials Modelling to Quantum Technologies; within physical sciences, the Centre for Planetary Sciences brings together researchers from Earth Sciences, Physics and Astronomy, the Mullard Space Science Laboratory and Birkbeck College; and the Institute of Risk and Disaster Reduction combines sociological, economic, legal and scientific research into natural disasters.

Our central London location is a major advantage for the faculty, bringing unrivalled opportunity for collaboration across a number of world-leading universities. These include the joint Centre for Doctoral Training in Geometry and Number Theory, hosted in conjunction with Imperial College and King's College London; the London Centre for Nanotechnology, created in partnership with Imperial College; our leading role in the Thomas Young Centre, an interdisciplinary research centre focusing on materials modelling; and key membership of the Natural Environment Research Council Doctoral Training Partnership. Besides our interactions with other universities in London we are founding partners in the Francis Crick Institute, one of Europe's largest medical research laboratories, and the Alan Turing Institute for big data science, both major new UK initiatives under construction within a 10 minute walk of our Bloomsbury campus. The faculty's research strengths benefit from these opportunities in energy and materials, big data, and the rapidly evolving interface between the physical and life sciences.

Distinctive Features / Best Practice

Research integrity training

Research integrity is a high priority for the MAPS Research Committee, and instilling appropriate ways of conducting research, analysing and reporting scientific results continues to be a priority for all research supervisors in the Faculty.

To supplement the training given by research supervisors and in departmental induction sessions, the faculty collaborates with the Faculty of Engineering Sciences in running training sessions for all year 1 MPhil/PhD students, using a fun, interactive format called the 'Dilemma Game'. The faculty's view is that this training should be conducted, wherever practicable, beyond the individual student's department, since ethical dilemmas in research can be approached in a number of different ways. Drawing students together from a range of disciplines helps to highlight the point that in some cases there is no 'right' answer when it comes to practices associated to research integrity: playing the game reveals that different disciplines often tackle the questions presented in different ways.

Students as partners – fostering student engagement

The faculty's approach to the development of research education is to involve students wherever possible. This we do in a number of ways – through the Faculty's Staff-Student Consultative Committee where the Faculty Student Academic Representatives (StAR) meet with the Dean and Faculty Graduate Tutor to discuss issues arising from the constituent departments and make improvements where possible. We also achieve this through encouragement of the active participation of the Faculty StAR for Postgraduate Research Students in the workings of the faculty's Research Students' Committee. In this way, students help to inform the development of research education within the faculty.

Student training for leadership

The faculty's PhD Student Research Festival is organised by a committee of postgraduate research students with support and guidance from the Dean, Vice-Dean Research and Faculty Graduate Tutor. The festival both celebrates the best of postgraduate research in the faculty and provides a group of PhD students the opportunity to develop their leadership and organisational skills in putting on an event of this type. The faculty provides an actively supportive environment for students as they develop academic and transferrable skills, with all students having access to an extensive range of skills courses through the Doctoral Skills Development Programme.