

The MPE CDT - PhD Phase

Handbook 2018/19

Cohort 2017

Mathematics of Planet Earth

The image shows the cover of a handbook. The background is a satellite view of the Earth from space, showing the blue oceans, green continents, and white clouds. The title 'Mathematics of Planet Earth' is overlaid on the image. 'Mathematics' is in a large, white, serif font. 'of Planet Earth' is in a smaller, yellow, serif font. On the left side, there are two vertical grey bars. The top bar contains the text 'The MPE CDT - PhD Phase' in white, sans-serif font. The bottom bar contains the text 'Handbook 2018/19' in white, sans-serif font. A blue vertical bar on the left side contains the text 'Cohort 2017' in white, sans-serif font.

Welcome to the EPSRC Centre for Doctoral Training (CDT) in the Mathematics of Planet Earth (MPE). You are now registered as PhD student at the Imperial College London within the MPE CDT. Most of you, who have just completed their MRes year, will already be familiar with many of the centre's procedures and activities. Even though you already know your way round, this booklet should act as a valuable resource giving you an overview of what to expect in the coming year and beyond.

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1. 2017 Cohort: 1st Year of the PhD phase

Students based at Imperial College London: Adriaan Hilbers, Mariana Clare, George Chappelle, Stuart Patching, Louis Sharrock, Niraj Agarwal, Alexander Alecio

Students based at University of Reading: Rhys Leighton Thompson, Manuel Santos, Leonardo Ripoli, Ben Ashby, Jennifer Israelsson, Ieva Dausickaite, Sebastiano Roncoroni, Elena Saggiaro, Georgios Sialounas

2. Important Dates for 2018/19

- **The Jamboree:** 18-20 March 2019 at Imperial College London
- **Science Communication Training for PhD students:** dates TBC

Please make sure that you regularly check the MPE CDT Calendar for additional events and amendments: www.mpecdt.org

3. The MPE CDT Specific Content

Bespoke the MPE CDT Training and Events for Years 2-4

The main activity in years 2-4 is of course research on the PhD project. There are also a number of extra training events and activities to develop students as research mathematicians in the climate/oceans/weather area.

The MPE CDT training events and activities

Year 2	Year 3	Year 4
<ul style="list-style-type: none">•The Jamboree•Cross-CDT Dragon's Den•Science Communication Training for PhD students•Outreach activities•MPE CDT Teaching	<ul style="list-style-type: none">•Management Skills Course•The Jamboree•Met Office Training and Research (MOTR)•Outreach activities•Internships and international placements•MPE CDT Teaching•Career planning residential course•Cross-CDT Dragon's Den	<ul style="list-style-type: none">•The Jamboree•Outreach activities•Internships and international placements•MPE CDT Teaching•Cross-CDT Dragon's Den

MPE CDT teaching

Students will be encouraged to assist with teaching on the MPE MRes, particularly leading tutorials on MPE Wednesdays, and assisting with computer laboratories in the core courses.

Met Office Training and Research (MOTR)

This is a 10-week programme, hosted by the Met Office in Exeter. Two weeks of lectures given by world-leading scientists (including from the Met Office) are followed by research internships, where students work in teams of 2 or 3 with Met Office staff, along with presentations and seminars through the period. The programme exposes the students to an applied research project outside their PhD topic and further

supports peer-to-peer learning, sharing of expertise, tackling problems by team work, and critical assessment and communication of scientific findings.

Management Training Course

1. Maximising Management Skills: Becoming an Effective Researcher

This workshop is suited for anyone in the first stages of a research degree. The session will discuss the effect of moving into research whether straight from an undergraduate degree, master's degree, the work place, and/or from overseas. We will explore what is expected of you as a researcher and how to manage a programme of research, including how to get the most from research meetings.

On completion of this workshop you will be able to:

- Identify and understand your and your supervisors' expectations.
- Recognise culture shock for you and others entering into research.
- Employ effective techniques for research meetings.
- Develop a planning strategy for your research.
- Evaluate your sources of feedback and support mechanisms.

2. Maximising Management Skills: Time Management Strategies for your PhD

Effectively managing your time during your Doctorate is essential to submit the thesis on time. However this is not just about your own time you will need to understand and respond to those around you to. Time management skills are useful in future careers and all parts of your life as well. This course was previously called 'Time Management'.

On completion of this workshop you will be able to:

- Identify the key obstacles to effective time management.
- Recognise your own behaviours and those of others around you.
- Use effective techniques to improve your time management and address barriers.
- Organise your time by effective prioritising and planning.
- Evaluate your progress using appropriate management techniques.

3. Maximising Management Skills: Put Project Management into Action

Typical project management techniques apply constraints in the form of milestones, duration, deadlines, resource allocation and cost. If these are rigid they can be limiting when working in research and innovation. This workshop examines how project management techniques can be used flexibly allowing for different outcomes and opportunities. This course was previously called 'Project Management for Researchers'.

On completion of this workshop you will be able to:

- Identify the key components of project management.
- Recognise which areas need to be flexible to encourage and allow for innovation.
- Use fuzzy/agile management techniques to guide your research work.
- Organise a plan for your research.
- Evaluate project management techniques, progress and plans.

Career planning residential course

Career Planning Course for CDT students is held at Cumberland Lodge (www.cumberlandlodge.ac.uk) in Windsor Great Park. The aim of this workshop is to provide individuals with the space to reflect on their career goals within the context of future expectations, and to support preparation for developing their careers.

Delegates will be able to:

- reflect on their career journey and generate an understanding of individual strengths
- create a vision that reflects individual career aspirations
- clarify their next steps and commit to realistic actions

CDT outreach

Our CDT outreach and associated cohort-building activities include:

- hosting the recently created open source Mathematics of Planet Earth Exhibition (imaginary.org);
- the creation of virtual MPE exhibits on the mpecdt.org website through an annual competition for teams of year 2--4 PhD students;
- co-organising the CDTs Festival of Science and Engineering;
- supporting of the MPE CDT outreach and awareness activities such as school competitions and placements, etc.

Internships and international placements

To promote international networking and expose students to industrial and commercial research challenges, students are encouraged to undertake during years 2-4 either:

- a 3-week international placement with our academic partners; or
- an industrial internship with our commercial partners.

Cross CDTs Dragon's Den

This Dragon's Den style competition offers seed funding to the winning team that will allow them to begin the commercial development of a scientific idea/invention unrelated to their PhD projects. The competition includes bespoke training and mentorship by the Imperial College Business School and external entrepreneurship experts.

The MPE CDT Transferable Skills Courses Programme

The MPE CDT Transferable Skills Courses Programme has been specifically designed to:

- Meet the diverse needs of the MPE CDT students, providing them with a range of opportunities throughout the duration of their research to continue their personal, professional and career management skills development.
- Facilitate cohort formation, networking opportunities and provide training to underpin multidisciplinary research.
- Recognise all career paths.
- Aim to enhance students' skills and competencies for current and future roles within academia and other employment sectors.

The Programme is coupled with a choice of transferable skills pathways that build upon Science Communication or Entrepreneurship skills. This will be complemented by the student selection of International/Industrial Placements.

Science Communication Training for PhD students (Justine Jones)

This communication training course counts as the two Graduate School professional development courses that Imperial PhD students are required to complete before the Early Stage Assessment. A further two Graduate School courses need to be taken before the Late Stage Review.

This PhD course follows the MRes course in communication skills. It is offered in the first year of the PhD and seeks to further Science Communication to broader audiences via group and individual presentation training.

After a grounding in basic communication skills students will be trained to present aspects of their research suitable for secondary school students and a broader lay audience. Imperial College

Outreach and/or the Royal Institution will provide speaking engagements for the groups while individual presentations will be selected from outreach opportunities including Fame Lab and the Three Minute Thesis as sponsored by the Graduate School. Each student will be required to participate in at least one of these activities. In addition, personal coaching for each group will be provided to ensure effective and appropriate content is implemented. Learning outcomes will include:

- How to tailor a presentation to a specific audience (secondary or primary school students, journalists and the media, lay academic audience)
- How to design dynamic slides for use in the presentations
- How to use props effectively
- How to use transitional expressions for pace and flow
- How to engage an audience through hands on involvement or large group participation
- How to use role play in presentations
- How to present content in an audience friendly way
- How to use vocal variety (stress, pause, pace) in spoken presentations
- How to use effective non-verbal communication
- How to interact as a group
- How to present yourself authentically

Following is an example of how each monthly two hour session will be structured:

Session one

Review of applied improvisational skills in groups

- Gibberish introductions
- Persuasion games
- Yes and no scenes
- One word stories
- Story story die
- Research explanations in one minute, thirty seconds
- Processing of experience with focus on applications

Session two

Understanding narrative (group and individual)

- Importance of storytelling on the brain
- Using metaphor and imagery
- Devising effective introductions
- Developing content
- Structuring dynamic conclusions

Session three (group presentations)

- Developing group cohesion
- Implementing smooth handovers
- Using role play techniques to enhance interest
- Introducing creative use of props

Session four (audience interaction)

- Running large group activities
- Running small group activities

Session five (individual styles)

- Use of vocal variety
- Use of role play to try on different presentation styles

Session six (group processing)

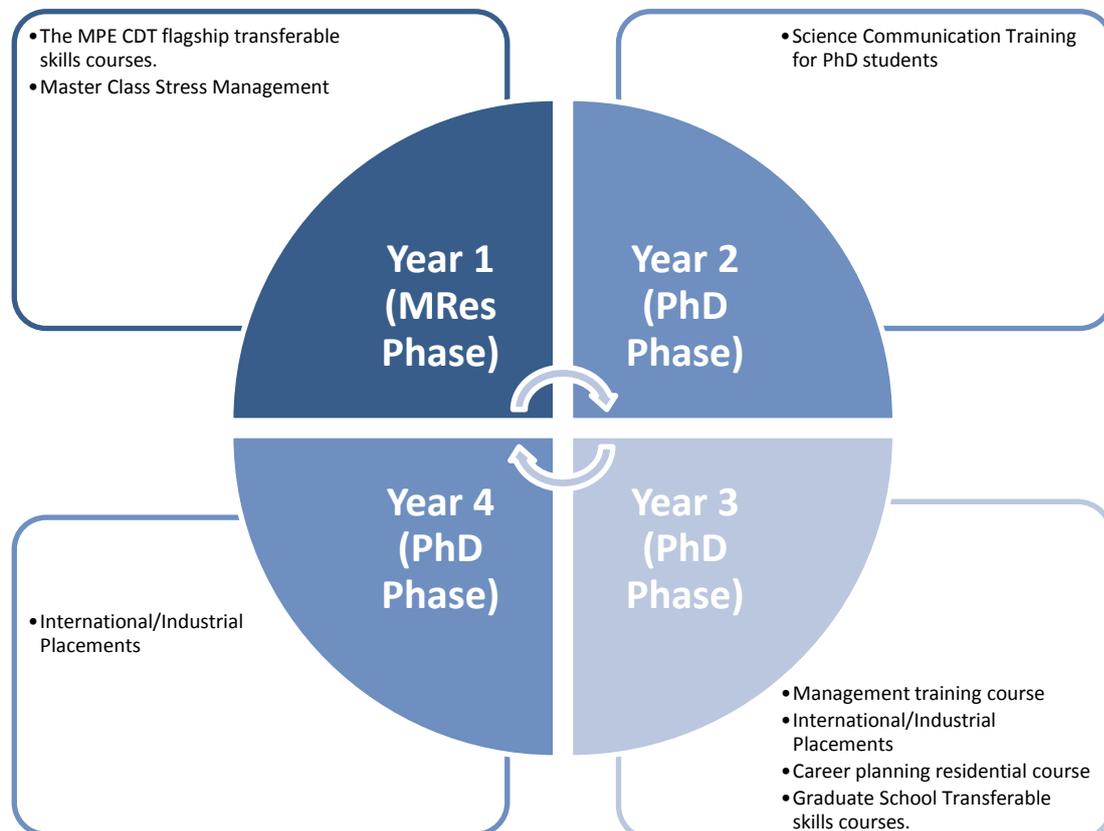
- How to participate in effective critiquing
- How to field questions

Sessions seven and eight (previewing group and individual presentations)

Detailed MPE CDT transferable skills schedule.

Year 2	The MPE CDT flagship transferable skills course	<ul style="list-style-type: none"> • Science Communication Training for PhD students
Year 3	The MPE CDT flagship transferable skills courses	<ul style="list-style-type: none"> • Management training course (1-day course at Imperial). • Career planning residential course. • International/Industrial Placements.
	Graduate School Transferable skills courses for Imperial-based students (you will still need to attend 2 Graduate School courses before you LSR.).	<p>This is coupled with a choice of the following transferable skills pathways:</p> <ul style="list-style-type: none"> • Research Skills & Development course (covering planning, project management, creativity in research, communication skills, group dynamics, networking and developing self-awareness). • Academic Writing course. • Stress Management: The PhD and Beyond <p>or:</p> <ul style="list-style-type: none"> • Academic Writing, • Becoming an Affective Researcher, • Science in Context: Science Communication, • Time Management. • Stress Management: The PhD and Beyond
Year 4	The MPE CDT flagship transferable skills courses	<ul style="list-style-type: none"> • International/Industrial Placements.

General overview the MPE CDT transferable skills schedule



Please note: All Imperial PhD students are expected to complete a programme of professional skills development training as prescribed by the Graduate School. Failure to complete the requisite training will delay a student passing the Early Stage Assessment and/or Late Stage Review, with consequential implications for progression and admission to the final PhD examination.

<http://www.imperial.ac.uk/study/pg/graduate-school/professional-skills/doctoral/professional-development-attendance-requirement/>

The MPE CDT Students' Budget

Each MPE CDT PhD student is provided with £1 000 in research training support grant (RTSG) per annum for three years. It may be spent on conference travel and accommodation, conference fees, summer schools etc. Good record keeping is essential; please keep a spreadsheet with your expenses claimed. In advance of incurring any expense, you must complete and submit the travel authorisation form provided by the CDT manager at your institute. This will be forwarded to the PhD director of studies for approval.

The CDT expects you to make the best possible use of each external trip. We expect you to take every opportunity to communicate your work, which in particular means that you will submit an abstract to events you attend for a poster or a talk whenever this is possible. The directors of studies take a dim view of cases where no abstract has been submitted because the deadline has passed.

Events often provide the possibility for students to apply for travel awards which offer benefits such as free registration or a contribution towards travel expenses. In addition to making the travel budget go further, winning travel awards is a way that you can demonstrate your ability to write a successful proposal based on your work. This is an important marker on your CV when you apply for your next position - whether inside or outside research. The CDT therefore expects students to apply for any available travel grants.

Once you have incurred your expenses, you need to submit the relevant institutional expense claim form and receipts to the CDT Manager at your institution. This should happen as soon as possible and in any event within three months.

The MPE CDT Website

www.mpecdt.org

Every MPE CDT student has a profile on this website. See www.mpecdt.org/students. By default the project abstract, supervisor information and Technologies will be displayed if you navigate to your profile. If you would like your biography, publications, a new mug-shot or any other changes displayed, just email Anna Radomska Botelho Moniz.

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