



Centre for Doctoral Training
**Mathematics of
Random Systems**

**EPSRC Centre for Doctoral Training in
Mathematics of Random Systems:
Analysis, Modelling and Algorithms**

2022 Cohort

Updated 9 May 2023

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Welcome and congratulations for your admission to the **EPSRC Centre for Doctoral Training in the Mathematics of Random Systems!** Our Centre was launched in 2019 through a partnership between UK Research and Innovation (UKRI) and three world-class departments in the area of probabilistic modelling, stochastic analysis and their applications: the Oxford Mathematical Institute, the Oxford Department of Statistics, and the Department of Mathematics, Imperial College London, with the ambition of training the next generation of academic and industry experts in stochastic analysis, stochastic modelling, advanced computational methods and Data Science. Our Centre also benefits from the generous support of several industry partners.

You are about to commence a 4-year comprehensive training programme, delivered by a pool of 50 researchers in our 3 partner departments, with the aims of bringing you to the frontier of scientific research in Probability, Stochastic Analysis, Stochastic Modelling, stochastic computational methods and applications in physics, quantitative finance, biology and data science.

Our goal is to prepare you for your research project by providing you with solid training in core skills in probability theory, stochastic analysis, mathematical modelling, data analysis, stochastic simulation and probabilistic algorithms. In the first year, you will follow four Core courses on Foundation areas as well as three elective courses and undertake a supervised research project starting the 2nd term. This research project is then expected to evolve into a PhD thesis, which will be the focus of the next 3 years.

This handbook is designed to help you understand the course structure, the requirements of the course, the key contacts and who you can go to if you need support. Please be aware that details may be subject to change. We encourage you to check the CDT website for the most up-to-date information:

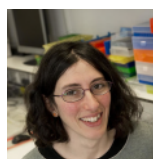
<https://www.randomsystems-cdt.ac.uk>

We wish you every success in your studies!



Prof Rama Cont
Director

director@randomsystems-cdt.ac.uk



Dr Melanie Witt
Administrator

info@randomsystems-cdt.ac.uk

The CDT Steering Committee

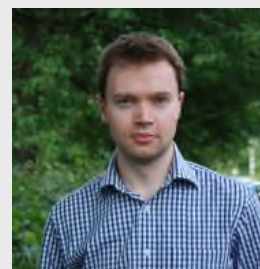


Professor Rama Cont, Director (director@randomsystems-cdt.ac.uk)

Rama Cont is Professor of Mathematical Finance at the Oxford Mathematical Institute and Head of the Oxford Mathematical and Computational Finance Group. Rama's research focuses on stochastic analysis, stochastic processes and mathematical modelling in finance, in particular the modelling of extreme market risks and systemic risk. Areas of study include stochastic analysis (pathwise methods in stochastic analysis, functional ito calculus), mathematical modelling in finance, systemic risk and financial stability, mathematical foundations of data science and data-driven decision systems.

Dr Thomas Cass, Academic co-director (thomas.cass@imperial.ac.uk)

Thomas Cass is a Reader in the Mathematics Department at Imperial College London. Thomas' research interests relate to the study of random phenomena. His research writings span both classical areas of stochastic analysis such as Malliavin calculus, and newly-emerging disciplines such as Rough Path Theory. He is also interested in the way in which deep insights in Pure Mathematics can spur developments in Mathematical Finance, especially numerical techniques.



Professor Ben Hambly, Academic co-director (hambly@maths.ox.ac.uk)

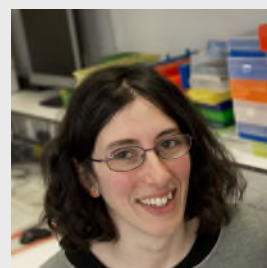


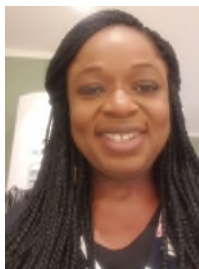
Ben Hambly is Professor of Mathematics at the University of Oxford. Ben's research interests are in probability, stochastic processes, financial mathematics and fractals. In particular pricing American style options, credit and correlated default, electricity price modelling and swing options, stochastic partial differential equations models for systemic risk and limit order books, diffusion processes on fractals, spectral problems for fractal domains, geometry of random fractals, rough paths and levy area, branching processes, general branching processes, branching random walk, and particle systems and random matrices.

Dr Melanie Witt, CDT Administrator

info@randomsystems-cdt.ac.uk / 01865 270501 / Room S0.37, Mathematical Institute, University of Oxford

Melanie Witt joined the Department of Mathematics at Oxford University in July 2019 as the CDT administrator. Melanie previously worked as a postdoc in the Department of Earth Sciences, University of Oxford investigating emissions of mercury from volcanoes, before moving to the Department of Physiology, Anatomy and Genetics, Oxford as research administrator for the Oxford Parkinson's Disease Centre and the Alzheimer's Research UK Network Oxford.





Lydia Noa, CDT Administrator Imperial College

lydia.noa@imperial.ac.uk / 020 7594 8532/ EPSRC Centres for Doctoral Training Suite, Level 4 ICSM Building, South Kensington Campus, Imperial College

Lydia Noa joined the department of Mathematics at Imperial College in June 2019. She previously worked at Imperial College as a Grants administrator within the Joint Research Office (JRO) and as a Research group administrator at the National Heart & Lung Institute (NHLI). Please contact Lydia regarding queries relating to Imperial College.

Dr Pietro Siorpaes, Year 1 Cohort Mentor (p.siorpaes@imperial.ac.uk)

Pietro Siorpaes is a Lecturer in Mathematical Finance at the Department of Mathematics, Imperial College London. Pietro's interest lie at the intersection of mathematical finance, probability theory and convex analysis. In particular, he has been working on optimal investment and utility-based pricing; on semimartingale theory; on pathwise notions of martingale inequalities and local-time; on martingale optimal transport.



Professor Julien Berestycki, Coordinator for Department of Statistics

(julien.berestycki@stats.ox.ac.uk)

Julien Berestycki is Associate Professor of Probability in the Department of Statistics University of Oxford. Julien's research is in probability theory and focuses essentially on models and situations which involve tree-like structures and branching phenomena. Examples include coalescent processes, branching processes, continuous random trees, branching random walks. These models are not only endowed with a remarkably rich mathematical structure that connects them to many area of mathematics, but they also occur naturally in physical sciences, in population genetics and in biology.

Professor Xue-Mei Li, Management Committee Member

(xue-mei.li@imperial.ac.uk)

Xue-Mei Li is Chair in Probability and Stochastic Analysis in the Mathematics Department at Imperial College London. Xue-Mei works in the intersection of Probability, Analysis, and Differential Geometry. She is interested in the evolution of physical quantities approximated by solutions of differential equations, with special interests in the intrinsic geometry of stochastic (random) processes and uses this understanding for complexity reduction and for multi scale and asymptotic analysis





Professor Jeroen Lamb, Management Committee Member

(jeroen.lamb@imperial.ac.uk)

Jeroen Lamb is Professor of Applied Mathematics in the Mathematics Department at Imperial College London. Jeroen's main research interest concerns bifurcations in dynamical systems: transitions between different types of dynamical behaviour when parameters are varied. His recent work has been concerned with dynamical systems that are influenced by noise. His research interests include local and global bifurcation theory, aperiodic tilings (quasicrystals, tiling dynamical systems), random dynamical systems and network dynamical systems.

Professor Christoph Reisinger, Management Committee Member

(Christoph.Reisinger@maths.ox.ac.uk)

Christoph Reisinger is Professor of Applied Mathematics at Oxford University's Mathematical Institute. His research covers various aspects of the development, analysis and implementation of numerical algorithms for partial differential equations and stochastic (partial) differential equations, such as those arising in financial engineering. As well as his specific interests in numerical analysis Christoph's mathematical finance research includes work on derivative valuation and counterparty credit risk (in particular, large pool contagion models), quantification of hedging errors, model calibration (FX, equity, credit) and investment and incomplete markets.



Professor Jared Tanner, Management Committee Member

(Jared.Tanner@maths.ox.ac.uk)



Jared Tanner is Professor of the Mathematics of Information at the Mathematical Institute, University of Oxford. Jared's focus is on the design, analysis, and application of numerical algorithms for information inspired applications in signal & image processing. Specific contributions include the derivation of sampling theorems in compressed sensing using techniques from stochastic geometry and the design and analysis of efficient algorithms for matrix completion which minimise over higher dimensional subspaces as the reliability of the data warrants. These techniques allow more efficient information acquisition as well as the ability to cope with missing data. Recent interests include new models for low dimensional structure in heterogeneous data and topological data analysis.

About the CDT

In the first year, students follow four Core courses on Foundation areas and three elective courses, and choose a main research topic and a research supervisor. This research project will then be expected to evolve into a DPhil thesis in years two to four. Progress will be assessed by the end of Michaelmas Term in year 2 (Transfer of status) and by the end of Michaelmas term in year 4 (Confirmation of status), these are discussed in more detail in the “progression and progress monitoring” section. These assessments involve the submission of written work and an oral examination.

As part of your 4-year doctoral programme in addition to your main research projects you are required to take part in CDT activities. These include a CDT spring retreat, the annual summer school in the first year as well as regular seminars, workshops and training in transferrable skills such as communication, ethics and team-working. **Failure to attend compulsory CDT activities may result in the loss of your funding.**

Your fellow students: the 2022 Cohort

Students will be registered students at either the University of Oxford or Imperial College London. Transfer between institutes will not be possible.

University of Oxford

Nicholas Daultry Ball

Sarah-Jean Meyer

Jad Hamdan

Olivia Pricilia

Adam Christopher Jones

Zihao Shen

Samuel Chun Hei Lam

Julius Villar

Jacob Mercer

Imperial College London

Holly Chambers

Tianyi Liu

Nicola Muça Cirone

Luca Marino

Vincent Goverse

Dmitrii Mints

Timothy Kang

David Villringer

CDT Timeline

An up to date timetable for CDT activities can be found at:

- <https://www.randomsystems-cdt.ac.uk/calendar>

Timeline for key milestones and events during your DPhil.

September 20 st – 30 th 2022	Foundation courses
3-7 th October 2022	Departmental and college induction events
Michaelmas Term (Oct-Dec) 2022	Four Core Courses: Oxford Lectures Tuesdays, Imperial lectures Wednesdays.
By the end of week 6 in Michaelmas term in year 1 (18 th November 2022)	Confirmed elective choices and enrolled on courses
Before start of Hilary term 2023	Confirmed supervisor for DPhil and have a title for research thesis
Hilary Term (Jan-Mar) 2023	Three elective courses. Generally assessments for these should be completed prior to the start of Trinity Term.
March/April 2023	Spring Retreat (3-4 days residential/remote course)
May 2023	Two-week group mini-project
Summer 2023	5-day Summer school
Week 0 Michaelmas term 2023	Teacher training session (<i>if not followed in 2022</i>)
Michaelmas term 2023	Teach at least one class
End of Michaelmas term 2023	Complete transfer of status
Before confirmation of status	Teach at least one additional class
End of Year 3	Complete confirmation of status
End of Trinity Term 2026	Submission of thesis

Please let us know if you have a disability that requires accommodations, a health or economic challenge that may impact your time in the CDT or a preferred gender pronoun.

If you have a schedule conflict due to your religious holiday, or other concerns that impede your ability to be effective on the CDT please tell us.

We want to create a welcoming, inclusive and equitable environment for all our students and welcome your input on how to achieve this.

General advice for your time with the CDT

- **Work together.** You will learn as much from each other as you will from members of the faculty.
- **Don't struggle in silence.** Make use of your peers, and departmental and college support. If there's a problem, let someone know (e.g. your cohort mentor, Pietro Siorpaes p.siorpaes@imperial.ac.uk who is often in Oxford, the CDT administrator melanie.witt@maths.ox.ac.uk, your student mentors).
- Stay on top of your workload. There is a lot to do.
- Pass on comments and suggestions to the directors and administrators so that the CDT experience is continually improved.
- Make the most of your interactions with industry. They can provide stimulation for your research projects (and the company might want to employ you).

From year 2

- Come to seminars. As well as broadening your scientific knowledge, attending seminars is useful for developing your own presentational skills. If a seminar strikes you as good or bad think about what makes it so. Don't worry if the seminar is not in your research area - it's still worth attending.
- Keep updated with Fridays@4 activities. They have a particular focus on graduate students and early career researchers. They have included skills sessions, careers events, Department Colloquia and junior colloquia.
- **Keep talking to each other, both within your cohort and to those in other years.**
- Be kind to yourself

Course Structure

First Year

In the first year, each course will have appropriate assessment and students will be awarded a pass or fail. Students will be required to pass every module; those failing any course may need to do additional work to demonstrate competence. Those obtaining a fail may be required to discuss their performance with the course directors.

Term 1

Introductory courses

Students follow mandatory coursework involving one 16-hour and two 8-hour introductory courses held in Oxford in the first 2 weeks (Sept 20-30). There will not be a formal assessment for these. However, you are expected to complete the exercises and attend classes.

The lectures and classes will take place in the Mathematical Institute in Oxford.

- Foundations of Stochastic Analysis (Prof. Ben Hambly, 8 hrs)

- Foundations of Data Science (Prof. Mihai Cucuringu, 16 hrs)
- Function Spaces and Distributions (Prof. Gui-Qiang G. Chen, 8 hrs)
- Tutorials in Stochastic analysis and Data Science

Core Courses

For the rest of the first term students take four compulsory advanced courses taught by Oxford and Imperial.

These courses will have an assessment which students will need to pass to progress on the DPhil programme. Normally assessment will be a short written report of up to 10 pages. The current plan is for Oxford and Imperial lectures to be taught in person with Oxford students travelling to London on Wednesdays and Imperial students travelling to Oxford on Tuesdays. This is subject to change as guidance is updated.

- Advanced Topics in Stochastic Analysis and Control (Dr Wolfgang Stockinger, Imperial College)
- Advanced topics in Stochastic Processes (Dr Oana Lang, Imperial College)
- Advanced Topics in Data Science: Deep Learning (Prof Jared Tanner, Oxford)
- Simulation Methods and Stochastic Algorithms (Prof. Christoph Reisinger, Oxford)

Further details on the course content in the first term can be found at: www.randomsystems-cdt.ac.uk/core-courses

Terms 2 and 3

Elective courses

- Students follow **three** elective courses at Oxford, Imperial College London or the Taught Course Centre. You will be required to pass an assessment for each of the three electives. Normally assessment will be a short, written report of up to 10 pages due in before the start of term 3. This should be discussed with the lecturer prior to the start of the course.
- We have selected a range of courses relevant to the CDT projects. These can be viewed at <https://www.randomsystems-cdt.ac.uk/electives>
- Chosen electives must be confirmed with the CDT administrator by the **end of week 6 in Michaelmas term** in year 1 (18th November 2022). Prior to this you should meet with one of the course directors to discuss your choices.
- Should you wish to choose a subject for your elective not on this list this must be agreed with your supervisor in advance.
- If there are courses of interest occurring in the subsequent years you are permitted to take these, provided your supervisor has confirmed there is sufficient time for your core research. However, you must have completed three elective courses by the end of your first year.

Year 1 Mini-Projects

A two-week group project will be assigned to groups of 5 or 6 students to work on collaboratively in May of year 1. These may be academic or industrial projects. Students will be required to produce a group report at the end of the project for the project partners, typically this report is given as a joint presentation.

Year 1 Spring Retreat

Students need to attend a 3-4-day course which is planned to take place in the Easter break of the first year. They will consist of talks relevant to the CDT and student presentations. Students will be required to give an oral presentation on their research project plans. Feedback will be given on these talks. We hope to be able to run this as a residential course.

Year 1 Summer School

We hope to be able to hold the 2022 Summer School on Mathematics of Random Systems as a residential course. You will need to attend this 5-day course of lectures and classes. Students may be required to prepare a presentation on their research for the school.

CDT Monthly Events

There will be monthly CDT events, which will roughly alternate between Oxford and Imperial. These are likely to be a mix of seminars, workshops and tutorials. Students will be required to take part in these events throughout their time in the CDT.

Years Two to Four

Years 2, 3 and 4 are dedicated to the students' research project, under supervision of the advisor.

Throughout the 4-year period students are required to participate in cohort activities such as the monthly CDT seminars/workshops in Oxford and London.

Failure to take part in compulsory CDT activities throughout the four years may result in the loss of your funding.

Students must fulfil their teaching requirements and skills training in order to progress through the DPhil milestones, see below for details.

All those involved with research at Oxford are expected to read and abide by the University's Code of Practice and Procedure for Academic Integrity in Research.

- <http://www.admin.ox.ac.uk/personnel/cops/researchintegrity/>

Transferable Skills Training

You will need to ensure **by the time you reach your Transfer of Status** (end of your 4th term), you have spent a **minimum of 5 days** (one full day=8 hours) on transferable skills courses. A maximum of 8 of these hours can be language courses. Training courses can be chosen and validated via the list at <https://www.mpls.ox.ac.uk/training/courses?tab=pgr>. You can find some suggestions for courses which may be useful at different stages of your DPhil on our website at <https://www.randomsystems-cdt.ac.uk/skills-training>. **Please keep your own record of Transferable Skills Training.**

All those involved with research at Oxford are expected to read and abide by the University's Code of Practice and Procedure for Academic Integrity in Research.

- <http://www.admin.ox.ac.uk/personnel/cops/researchintegrity/>

Students in the MPLS Division are required to complete the **online Research Integrity course by the time they apply for Transfer of Status**. The Division also offers face-to-face Research Integrity training which complements the online course. All CDT students must complete this training before transfer of status.

- <https://researchsupport.admin.ox.ac.uk/support/training/ethics>

Teaching Development in Oxford

We generally recommend you do not start your teaching programme until the second year to make sure you have enough time to focus on your own studies. In some cases, you can take on teaching in your first year with permission from your supervisor/course directors.

You will need to take part in departmental training with all other DPhil students before you start teaching in the department. This generally takes place at the start of the academic year as part of the DPhil induction week.

All research students are asked to undertake teaching within the department. More specifically students are **required to teach at least one set of classes before transfer of status and at least one further set of classes before confirmation of status**. This will usually take the form of acting as Teaching Assistant or Class Tutor for a particular undergraduate course. You should make sure you have your supervisors' permission in advance. Permission must be obtained from the head of department to do teaching outside the department (including for any college teaching). It is recommended that teaching time is no more than six hours in any week.

Supervision, mentoring and support

As part of your welcome and induction into the department we have allocated a 'buddy' from Oxford and Imperial for each of you. These buddies are students entering the second year on the CDT. We hope that you will meet with your "buddy" a few times as you start on the CDT. The list of assigned buddies are as follows:

	Provisional Mentor	Oxford Buddy	Imperial Buddy
Nicholas Daultry Ball	Justin Sirignano	Min Chul Lee	Martin Peev
Jad Hamdan	Jon Keating	Rivka Mitchell	Akshunna S. Dogra
Adam Jones	Michael Monoyios	Shyam Popat	Joseph Mulligan
Chun Hei Lam	Justin Sirignano	Jason Rader	Owen Futter
Jacob Mercer	Matthias Winkel & Julien Berestycki	Mark Jennings	Roan Talbut
Sarah-Jean Meyer	Massimiliano Gubinelli	Milena Vuletic	Giuseppe Tenaglia
Olivia Pricilia	Alvaro Cartea & Christoph Reisinger	Nikkita Ngalande	Lorenzo Lucchese
Zihao Shen	Zhongmin Qian	Slava Cherepanov	Bernat Bassols Cornudella
Julius Villar	Dmitry Belyaev	Yifan Jiang	William Turner

We have also allocated you a faculty mentor who you should aim to meet with at least twice in the first term to discuss your progress. The mentors assigned here do not necessarily have to be your supervisor for your research project. By the start of your second term you should have a confirmed supervisor and a plan for your initial research project. **Your main supervisor must be based at the University of Oxford.**

The supervisory relationship is one of the most crucial ingredients underpinning successful research. The relationship is two-sided with obligations on supervisors as well as the student. Like any relationship,

it has to be worked at and nurtured. It is therefore important to establish clear and explicit mutual expectations in order to minimise the risks and possible difficulties of personality clashes. You should ensure you meet with your supervisor regularly and be proactive in arranging meetings. It is suggested that the programme of meetings is drawn up well in advance and that supervisors and students avoid rescheduling.

The Oxford Learning Institute's Research Supervision website (<http://www.learning.ox.ac.uk/supervision>) is useful to DPhil students although it is also aimed at research supervisors. The EPSRC also provides advice for students on their website (<https://www.epsrc.ac.uk/skills/students/help/guidance/>).

Each cohort will also have a mentor for their first year, yours is Pietro Siorpaes (p.siorpaes@imperial.ac.uk). He will meet informally with you to check that you are on track. Throughout your DPhil others in the CDT are available for support, in addition you can approach your research group members, and others in the department for support. If in doubt, the CDT administrator can help with identifying routes for finding help and guidance.

All colleges have a comprehensive pastoral support system for Oxford Graduate Students, with a dedicated member of staff responsible for Graduate matters. Each Oxford student will have a College Advisor who will provide access to tailored pastoral, financial, welfare and academic related support independent of the CDT.

Termly Reporting Requirements

Graduate Supervision Reporting (GSR) allows students and their supervisors to report on the student's progress in their research project, and to reflect on your development as an independent researcher. Students and supervisors are required to write formal reports on your academic progress at the end of each term, and during the Long Vacation.

It is mandatory for all research students within MPLS to submit a reflective report on their progress each term via GSR. You will be sent an e-mail each term inviting you to log into GSR (via student self-service) to submit a self-assessment report. You will be prompted to list completed training / identify any other training needs and provide a comprehensive overview of your progress. You can also set a flag if you have any concerns with your academic progress. This will be highlighted to your Supervisor(s), Director of Graduate Studies, and College Adviser. Once your report is submitted your supervisor(s) then completes a report on your progress, which will be available for you to view.

GSR is open for students from Monday of week 7 to noon on Friday of week 9 of each term. **If you do not submit a report either for two subsequent terms, or for two terms out of three (on a rolling basis) this will trigger you being invited to a meeting with the CDT Directors to discuss your progress.**

Logistical Information

Your first year in the CDT is likely to be hectic and demanding. You can expect to need to work some evenings and weekends to keep on top of the material in the courses and get your assignments completed. For work undertaken in small groups you will need to collectively organise your time. The

timetable for the CDT runs independently of the universities' term. It is important to maintain a presence in the department and with your cohort as well as attend the various skills training and CDT activities.

Travel and Financial Information

Travel for CDT Activities (lectures, workshops etc)

Travel may be required between London and Oxford to attend CDT lectures, seminars and other events as part of the CDT. To facilitate this the CDT will cover the cost of a [railcard](#) and contribute up to £30 per return journey. Please note this is a maximum amount and we expect travel costs to be the best value possible by booking fares in advance, making use of railcards/purchasing multi-ride tickets for the [Oxford Tube](#) bus route. Your claim may be queried if you are regularly requesting the cost of on-the-day fares to be reimbursed/travelling on anytime day returns.

Purchases through Key Travel and Expenses Claims

Advanced train fares, flights, and accommodation can be bought via the University's Online travel agency [Key Travel](#) and charged directly to the CDT, (see CDT administrator for details). If you do need to claim back travel costs you will need original valid receipts and relevant paperwork. If you are claiming funds for meals, please keep the part which details what was eaten rather than just the final amount. Please contact the CDT administrator for assistance.

Expenses claims are made via the [SAP Concur eExpenses system](#). Please contact the administrator for the correct code to use for your claim. There is some guidance here from the university on [allowances for travel](#). You are expected to use the best value for money method of travel. Guidance is also given on the appropriate level of spending on [accommodation and food while travelling](#).

Travel for Conferences and Other Meetings

You do not need to apply for funding for travel related to required CDT activities or visits to industry partners/external supervisors in the UK. The CDT should be able to support student travel to at least one UK and international meeting/conference/summer school each year. In some cases, support for additional meetings may be possible. Attendance at these should be discussed with your supervisor and approval sought for travel funding in advance of purchase via the CDT travel application form sent to the CDT administrator.

We expect you make every effort to be as economical as possible. In particular, you should approach your college for funding for each conference where you will make a presentation and apply for any funding available through the conference itself.

Travel Insurance

While you are travelling, your personal safety and welfare are very important to us. The University provides [travel insurance for students travelling on University business](#) and has many [guidelines](#) on your safety when abroad.

If you do not fill out the form you will not be covered by the University's Travel Insurance. You may also need to complete risk assessments to qualify for the insurance. It is important to complete the

application for the University's Travel Insurance **even if you have your own personal travel policy** as in some cases these will not cover travel for business purposes.

Holidays

You should agree any days off in the working week (Monday-Friday) with your supervisor, to avoid any conflicts. Your leave must work around the compulsory elements of the CDT course and should generally be planned outside of term-time.

As a minimum you should take 20 workdays leave in addition to bank holidays (8 days) and periods of fixed closure for the Department (at Christmas and Easter, 6 days in total). Where Bank Holidays are worked time can be taken in lieu.

Guidance on working hours and paid work

CDT students should **regard their studies as a full-time occupation** of at least 40 hours per week, and should make themselves available for academic commitments during core working hours (9 am to 5 pm on weekdays). Only time spent engaged in focussed, conscientious work should be counted towards working hours.

The maximum number of hours that a DPhil student should be working is an average of 48 hours over 17 weeks. It is recognised that sometimes long working hours are needed for a period to manage the demands of the research, but no student should be regularly working above this number of hours unless they have explicitly and freely chosen to do so.

CDT students are advised that any paid work should still allow them to spend at least 40 hours per week for a minimum 44 weeks of the year on their studies. CDT students should discuss any plans to take on external work with their supervisor.

See the link below for University guidelines on paid work by doctoral students:

<https://academic.admin.ox.ac.uk/policies/paid-work-guidelines-graduate-students#collapse1002901>

Absence/Illness

If you need to take time off due to illness or unforeseen circumstances, please contact the CDT Administrator as soon as possible by phone or email. It is important for us to know your whereabouts as we have a duty of care. Recording all periods away from the department is especially important for students studying under a student visa as we have a legal responsibility to the UKBA to know where you are.

Residence Requirements (Oxford)

For information required minimum residence requirements regarding your DPhil for Oxford students, please see

<http://www.ox.ac.uk/admissions/graduate/why-oxford/living-oxford/accommodation#residency>

The residency requirements may change in relation to Covid-19 restrictions.

Progression and progress monitoring

The notes below are designed to complement those in the handbook for your department. You should refer to your departmental handbook for full regulations and advice. The Departmental Policies and University Regulations for students studying at Oxford can be found at the links below:

Mathematics Institute

- <https://www.maths.ox.ac.uk/members/students/departmental-and-university-regulations>
- <https://www.maths.ox.ac.uk/members/students/postgraduate-courses/doctor-philosophy/handbooks>

Department of Statistics

- <https://www.stats.ox.ac.uk/student-resources/research-degrees/>

Transfer of Status

By the end of Michaelmas Term, Year 2: students' progress on their research project is assessed through a transfer of status process. To progress you will be expected to have **passed the assessments** on the core courses and electives. You may be examined on these courses at your Transfer exam if you have not passed. You should also have completed the required **transferable skills** courses, **research integrity** course, and **teaching** as outlined above. Students are also required to take part in the cohort activities and any absences from these must be explained. In order to transfer, you must also write a **short dissertation** which is specifically for the purpose of supporting that transfer application. Don't underestimate the amount of time it will take to write your dissertation and polish it to the required standard.

The purpose of the transfer process is to ensure that you have a convincing research programme, that you are making satisfactory progress in its development, and to satisfy the assessors that the work is potentially of DPhil quality. Two assessors, neither of whom will be your supervisor, will consider your application and **interview you at a viva**.

A very useful checklist for transfer of status and a project initiation plan can be found at:

<https://www.mpls.ox.ac.uk/graduate-school/information-for-postgraduate-research-students/progression>

If your first application for transfer to DPhil status is not approved, you are permitted to make one further application and will be granted an extension of time for one term if this is necessary for the purposes of making the application. Assessors may recommend that you should transfer to a lower level of research degree course as appropriate. If you wish to contest the outcome of the transfer assessment, either on procedural or academic grounds, you should first discuss the matter with your Director of Graduate Studies.

Confirmation of status

By the end of Michaelmas Term in Year 4: students will need to have their DPhil status “confirmed”. The purpose of confirmation is to enable you to receive an assessment of your work and to provide an important indication that, if work continues to develop satisfactorily, it would be reasonable for you to submit your thesis within three terms. The confirmation involves an interview with two assessors who are not part of your supervisory team. You must have taught at least one set of classes before transfer of status and at least one further set of classes before confirmation of status.

The purpose of confirmation is to confirm that you are continuing to work at the appropriate doctoral level and to provide assurance that if the work on the thesis continues to develop satisfactorily, then consideration of submission within the course of three further terms would appear to be reasonable.

Submission of Thesis

We expect all students to have submitted their DPhil thesis by the end of their 4th year.

When you and your supervisor are agreed that your thesis is within one term (and the vacation which follows) of completion you should arrange for the completion of GSO.3 form to appoint final examiners <http://www.ox.ac.uk/students/academic/guidance/graduate/progression/>. The form has sections which should be completed by your supervisor, and by your College (which may all take time). When the form has been handed in to the Graduate Studies Administrator, it must be approved by the Director of Graduate Studies and two examiners will be formally appointed on the recommendation of the supervisor. Two copies of the thesis should be submitted no more than a term (and the vacation which follows) after this has happened.

A research thesis is normally examined by two examiners, a member of the Department and an external examiner who is an expert in the particular topic. The external examiner is usually a senior member of staff from another university. After reading the thesis the examiners will hold an oral examination where you will be asked questions about your work and about your wider knowledge of the subject.

Minor revisions to a DPhil thesis may be required. Alternatively, you may be required to resubmit the thesis with or without a further oral examination. Exceptionally, the degree of MPhil may be awarded instead of the DPhil, or the examiners can decide not to award a degree.

Resources available to CDT Students

In the first year you will all be based in the CDT rooms in the Mathematical Institute. There will be desktop computers in the room; should their number prove insufficient then we will address this issue. These machines will provide access to mathematical software. In later years, you will be physically located within the research group of your primary supervisor.

All CDT students have access to:

- Electronic & paper journals (NB you need to use an Oxford VPN or laptop departmental machine to access the electronic ones)
- Department bench collections (small collections of relevant books)
- Libraries
- Bookable teaching space
- Black & white and colour printers throughout the building.

- Social spaces including the common room and the café

We encourage you to make use of all of these resources.

CDT GPU Access

For those of you requiring additional computations requiring additional machines there is information on what is available in the department here: <https://www.maths.ox.ac.uk/members/it/machines>

The CDT has purchased GPUs for your use in computational projects. Our machine has 3 x Nvidia 2080Ti GPUs with 384GB of RAM, 32 CPU cores and 4.5TB of local storage space for data.

There are a couple of ways to connect to **elixir.maths.ox.ac.uk** (the CDT compute server). The machine is accessible via SSH by connecting first to gate.maths.ox.ac.uk (you can skip this step if you're in the institute), and then making an SSH connection again to elixir.maths.ox.ac.uk (logging in using your maths username and password). This will give you command line access, so it's only suitable for operations that don't require graphics. If one needs access via a graphical user interface though, then this can be achieved by using X2Go as described in the following address:

<https://www.maths.ox.ac.uk/members/it/faqs/connection/remote-access-linux-systems>

using **elixir.maths.ox.ac.uk** as the host address.

Student Support

MPLS Division Postgraduate Research information (here you will find lots of useful information relating to the processes for DPhil students in Oxford):

<https://www.mpls.ox.ac.uk/graduate-school/information-for-postgraduate-research-students>

Welfare

Students are always welcome at any time to discuss their concerns with the CDT Director, Co-Directors, CDT Administrator, Academic Administrator and any other member of the department they feel comfortable with.

Support is also available via College Advisors and College Offices. Every graduate student at Oxford has a College Adviser, who is an academic member of his or her College, usually a Fellow. The role of the College Adviser is additional and complementary to that provided in the student's department or faculty. The College Adviser is not expected to perform the role of the Department Supervisor, or to be responsible for directing students' academic work. Rather, the intention is to provide a focal point for an individual student's relationship with the College, and general academic or pastoral advice and assistance throughout the student's course of study.

Other sources of advice and help include:

Student Counselling Service	http://www.ox.ac.uk/students/welfare/counselling/
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To request an appointment, contact the Counselling Service in person, by phone or email. After you have made this initial contact, you will be sent a pre-appointment form to complete.

Please note that you are eligible to refer yourself to, and use, the Counselling Service during a period of suspension. If you are already engaged with the Counselling Service at a time when you suspend you can continue with your counselling until an appropriately agreed ending.

The service run a wide range of workshops and have a range of podcasts which may be helpful in managing your wellbeing.

Oxford University Student Union

<https://www.oxfordsu.org/advice-wellbeing/>

Independent advice and information service exclusively available to Oxford University students.

Peer Support

<https://www.ox.ac.uk/students/welfare/peersupport>

Students trained to provide support to other students. There are Peer supporters based in colleges and Peers of Colour, Rainbow Peers, and Disability Diversity Peers available.

Nightline

<https://oxfordnightline.org/>

An independent listening, support and information service run for and by students of Oxford and Oxford Brookes universities. Available 8pm-8am Monday to Sunday, 0th week to 9th week during Oxford University term time.

Current information for students – health and welfare

<http://www.ox.ac.uk/students/shw/>

Mental Health First Aid

If you feel distressed or in need of support and guidance about how to look after your own mental health, or if you have concerns about someone else’s mental wellbeing, please contact one of the Mathematical Institute’s [Mental Health First Aiders](#). They have received training to understand mental health and the factors that can affect wellbeing. They will listen to you non-judgementally and confidentially, and will guide you to further support.

Access to External Support and Resources

If you'd prefer to access support outside the university, the Mathematical Institute has partnered with Validium to provide an extensive Employee Assistance Programme (EAP), accessible to all Mathematical Institute staff and post-graduate research students.

Employee Assistance Programme (EAP)

Support for personal and work issues

Your organisation gives you free access to an Employee Assistance Programme for information and counselling services. The EAP, which is provided by The Validium Group, is available 24 hours a day, 365 days a year.



Counselling Support

Counselling is a safe place for employees to explore personal or work-related concerns with professional support. This may take the form of counselling over the telephone, referral to face to face counselling, eCounselling, online resources or signposting to other agencies, as appropriate.



Legal

A specialist team of lawyers is available to provide employees with help and guidance on many different areas of personal law, including consumer, property, landlord/tenant, family and motoring law.



Money & Debt Specialists

A dedicated team is available for employees to access information on money matters, which may be affecting their welfare, including managing creditors, budgeting and debt management plans.



Health & Wellbeing

The occupational health nurses provide employees with information and guidance on lifestyle issues such as diet, exercise and sleep, as well as answering questions about health and medical matters, child care and eldercare issues.



Manager Support

Managers can contact a specialist manager support team for confidential support when assisting employees with their problems, tackling difficult management issues, responding to the early warning signs of stress and referring colleagues to the EAP.



vClub Online

The vClub online EAP gives employees access to hundreds of downloadable help sheets, links to specialist resources and access to e-counselling.

0800 3 58 48 58

Outside UK: +44 141 271 7179

For online support join vClub at validium.com

Username: **math**

Password: **eap4support**

NGT Service: 18001 = helpline number or download NGT Lite App.
Ensure your device is connected to Wi-Fi to run NGT Lite.

 **validium**
IMPROVING MENTAL HEALTH

My vClub - Available on App Store & Google Play

Harassment

The Mathematics Institute has a number of advisors who can be found via <https://www.maths.ox.ac.uk/members/personnelhr/during-employment/harassment>. The Oxford Statistics departmental advisors on matters of harassment are Ms Hannah Harrison (room G.11), tel. x82857, hannah.harrison@stats.ox.ac.uk or Dr Neil Laws (room 1.04), tel. x72597, laws@stats.ox.ac.uk.

Alternatively, if you do not feel comfortable talking to someone from within the Department, you can access the University's anonymous Harassment Line: <https://edu.admin.ox.ac.uk/harassmentadvice>

The University's *Policy on Harassment including Bullying* can be found at: www.admin.ox.ac.uk/eop/harassmentadvice/

Disability/communication support

In the Mathematical Institute Charlotte Stewart (charlotte.stewart@maths.ox.ac.uk) and James Sparks (james.sparks@maths.ox.ac.uk) are responsible for disability support within the Department. The Disability Co-ordinator for the Department of Statistics in Oxford is Mrs Jan Boylan (room G.09, tel. x 72870, email academic.administrator@stats.ox.ac.uk). The academic departmental Disability Lead in Statistics is Dr Neil Laws (room 1.04), tel. x72597, email laws@stats.ox.ac.uk.

Disability Advisory Service: the central service within the University, who can organise support ranging from library access to alternative examination arrangements.

<http://www.ox.ac.uk/students/welfare/disability>

Language Centre: courses in Academic English are available from the University Language Centre, and costs may be covered by the Department (enquire with Sandhya.Patel@maths.ox.ac.uk). <https://www.lang.ox.ac.uk/>

University Language Centre

International students, whose first language is not English, are strongly advised to visit the University Language Centre to find out more about the courses on topics such as Academic Writing and Advanced Communication Skills which run during term time. These have a registration fee for graduate students. Details are available at <http://www.lang.ox.ac.uk/courses/english.html> .

Childcare Services

Information on the University's childcare services can be found at <http://www.admin.ox.ac.uk/childcare/>

The Careers Service

The University Careers Service can be found at 56 Banbury Road with a website at <http://www.careers.ox.ac.uk/>. It is a free service for all Oxford University students including postgraduates, and also for alumni. It provides one to one guidance, support and advice; information on occupations, vacancies and further study; feedback on CVs and application forms; and skills coaching for preparing for interviews and making applications.

The Careers Service also runs the University Internship Programme

<http://www.careers.ox.ac.uk/internship-office-and-work-experience/the-internship-programme/>.

University policies

The University has a wide range of policies and regulations that apply to students. These are easily accessible through the A-Z of University regulations, codes of conduct and policies available on the Oxford Students website www.ox.ac.uk/students/academic/regulations/a-z.

These policies include:

Equal Opportunity Policy for Students <http://www.admin.ox.ac.uk/eop/policy/equality-policy/>

Code of conduct for using IT facilities www.it.ox.ac.uk/rules/

Proof-reading

It is the responsibility of the students to ensure that their thesis has been adequately proof-read before it is submitted. The student's supervisor may alert them if they feel further proof-reading is needed, but it is not their job to do the proof-reading. The student should proof-read their own work, as this is an essential skill in the academic writing process. However, for longer pieces of work it is considered acceptable for students to seek the help of a third party for proof-reading. Such third parties can be professional proof-readers, fellow students, friends or family members (students should bear in mind the terms of any agreements with an outside body or sponsor governing supply of confidential material or the disclosure of research results described in the thesis). Proof-reading assistance may also be provided as a reasonable adjustment for disability. The student's thesis may be rejected by the examiners if it has not been adequately proof-read.

The University's Policy on the Use of Third Party Proof-readers may be found here: <http://www.admin.ox.ac.uk/edc/policiesandguidance/policyonproofreaders/> The MPLS Division offers training in proof-reading as part of its [Scientific Writing](#) training programmes.

Plagiarism

Plagiarism is the copying or paraphrasing of other people's work or ideas into your own work without full acknowledgement. All published and unpublished material, whether in manuscript, printed or electronic form, is covered under this definition. Collusion is another form of plagiarism involving the unauthorised collaboration of students (or others) in a piece of work.

Cases of suspected plagiarism in assessed work are investigated under the disciplinary regulations concerning conduct in examinations. **Intentional or reckless plagiarism may incur severe penalties, including failure of your degree or expulsion from the university.**

For more information on what constitutes plagiarism and to find an online course for a useful overview of the issues surrounding plagiarism and practical ways to avoid it visit:

<https://www.ox.ac.uk/students/academic/guidance/skills/plagiarism>

Research integrity

Research integrity is a commitment to creating an environment that promotes responsible conduct by embracing standards of excellence, trustworthiness and lawfulness. The University expects its students to maintain the highest standards of integrity in their research.

For individual researchers, research integrity entails a commitment to a range of practices including:

- intellectual honesty in proposing, performing, and reporting research;
- accuracy in representing contributions to research proposals and reports;
- transparency in handling conflicts of interest or potential conflicts of interest;
- protection of human participants in the conduct of research;
- humane care of animals in the conduct of research.

There are no universally correct ways to do research. There are, however, standards of practice which apply generally. Researchers should:

- be aware of the legislation, codes of practice and University policies relevant to their field;
- have the necessary skills and training for their field;
- comply with University and funder policies relating to research data management;
- be aware of the publication rules for the journals they want to publish in;
- ask if they feel something isn't quite right;
- not ignore problems;
- be accountable to the University and their peers for the conduct of their research.

All researchers are expected to be committed to ethical principles and professional standards. Not upholding such standards, either intentionally or through lack of knowledge, damages the scientific process and may harm research participants, colleagues, the University and society as a whole.

All those involved with research at Oxford are expected to read and abide by the University's [Code of Practice and Procedure for Academic Integrity in Research](#).

Students in the MPLS Division are required to complete the online Research Integrity course by the time they apply for Transfer of Status. <https://weblearn.ox.ac.uk/portal/site/:skills:ricourses>

The Division also offers [face-to-face Research Integrity](#) training which complements the online course.

The University's [Research Integrity website](#) contains a number of additional resources, including links to information on authorship, conflicts of interest, research data management, health and safety, human participations in research, intellectual property, research involving animals, and research misconduct.

Your supervisor will play an important role in helping you to develop skills for good practice in research, and is the first person you should ask if you have queries about any aspect of research integrity. Other sources of support and advice include your Director of Graduate Studies, other academics in your department, and the ethics advisors in University Research Services.

Complaints and Appeals

Student complaints regarding any aspect of the first year training will be handled through the complaints system at the University of Oxford, unless they relate specifically to activity at Imperial College London. Complaint issues in later years will be handled by the University of Oxford. Discipline cases for Oxford students will be referred to the University of Oxford. The University of Oxford may share information with Imperial College London relating to such cases as appropriate.

- <https://www.ox.ac.uk/students/academic/complaints?wssl=1>
- <https://www.imperial.ac.uk/about/governance/academic-governance/academic-policy/complaints-appeals-and-discipline/>

Statement of Expectation for UKRI students

The Research Councils have released a single statement on how research organisations, students and their respective training environments must operate for all students funded by UKRI. <https://www.ukri.org/skills/policy-and-frameworks/>

Publications & Research Outputs

Research Fish

The UK Research and Innovation (UKRI) ask students supported by EPSRC studentships to provide, via researchfish®, up-to-date information about the outputs and outcomes arising from their research. It is important that doctoral students are able to tell EPSRC about their research activities and successes, and the information helps UKRI understand how students contribute to their respective areas of research and engage with partner organisations and other communities. It allows the UKRI to acknowledge and further promote students' achievements and to make the case to Government for continue public funding of similar studentships in the future. Such activities can include invited talks, poster/oral presentations, outreach activities, awards and publications.

EPSRC submission Period in researchfish® usually takes place in February each year.

When you register for a researchfish account you have to set up your own username and password and should use these to login at <https://www.researchfish.com/>. For advice on this please contact the CDT administrator in the first instance.

Acknowledgements in publications

Please include the following acknowledgement in all papers:

"This publication is based on work supported [or partially supported] by the EPSRC Centre for Doctoral Training in Mathematics of Random Systems: Analysis, Modelling and Simulation (EP/S023925/1)"

Act on Acceptance / ORA

The Oxford University Research Archive (ORA) is a permanent and secure archive of the University which preserves an array of research publications, journal articles, conference papers, working papers, theses, reports, book sections and more. Unpublished academic work is also deposited into ORA, maximising the University's research output. All papers and your final thesis must be submitted to ORA.

More specifically, in order to be eligible for the next REF, the final peer-reviewed version of journal articles and conference papers (with an ISSN) must be deposited in an open access repository within three months of acceptance for publication. When you've had a paper accepted for publication, please Act on Acceptance – deposit the accepted manuscript (the final peer-reviewed version) into the ORA within 3 months of acceptance. A guide on how to submit can be found here: <http://openaccess.ox.ac.uk/wp-content/uploads/sites/2/2017/08/Symplectic-ORA-deposit-guide-v3.5-Aug-2017.pdf>

Research Data management

In order to ensure that it is easy for researchers to compare their work quantitatively to others, to check whether the results printed in papers can indeed be obtained by the stated mathematical method, and to see whether the results of new research are better, for example in terms of accuracy, EPSRC require authors of journal articles and conference papers to make their "underlying data" openly available, after a potential embargo period.

For typical Maths papers, this means the following: for each plot, unless it is a very simple function specified in the paper, the authors must provide either a file with the relevant tabulated data, or the software which generated the data and plot. The collected data forms a dataset which must be openly available and archived for at least 10 years using a permanent DOI label, and this DOI must be provided in the paper, typically in the Acknowledgements section after acknowledging EPSRC funding. There is no particular format required, but a csv text file is recommended.

In practice, this means that students should upload the data associated with the plots in their papers onto the Oxford University Research Archive (ORA) alongside submitting their paper.

Further information, including on how to upload data into ORA, can be found at <https://www.maths.ox.ac.uk/members/research-support-ref-open-access/research-data-management>