Course Information Sheet for entry in 2022-23: DPhil in Atomic and Laser Physics

About the course

The department researches the interaction of light and matter over an enormous range of conditions, from high-energy plasmas created by the most powerful lasers in the world, to the coherent manipulation of single quantum particles for implementing quantum information processing, to the creation of exotic states of quantum matter such as Bose-Einstein condensation.

Research in atomic and laser physics (ALP) involves some of the most rapidly developing areas of physical science and ranges from the fundamental physics of quantum systems to interdisciplinary application of lasers. The themes include the following, using both experiment and theory:

- quantum computation
- quantum cryptography
- quantum chaos
- quantum memories
- optical manipulation of cold atoms and molecules
- ultra-cold matter
- Bose-Einstein condensations
- optical lattices and quantum simulations
- ions traps and entanglement
- non-linear optics
- cavity quantum electrodynamics
- quantum optics
- high-intensity laser interactions
- ultra-fast X-ray science
- laser-plasma science
- attosecond optics
- optical metrology and precision spectroscopy
- fundamental tests of QED
- femtosecond combs
- EPR and NMR for QIP
- laboratory astrophysics.

At graduate level, the department primarily offers the DPhil research degree (equivalent to a PhD). In very exceptional cases, it may be possible to do an MSc by Research in Atomic and Laser Physics. There is no graduate taught master's course in ALP.

The DPhil is a research degree and you normally start working on your main research project as soon as you arrive. A list of current projects is available on the ALP website.

In parallel with your project, you will be expected to attend a taught course in atomic and laser physics in the first year, comprising lectures, seminars and discussion classes at graduate level. Depending on your level of knowledge, the department may also require you to attend lectures in the final year (master's-level) undergraduate course at Oxford.

The ALP sub-department provides a detailed timetable and syllabus list for the graduate class. Topics covered include:

- basic light-matter interaction
- photonics and quantum optics
- laser-plasma interactions
- quantum information processing and communication
- trapped particles and quantum gases
- high energy density science.

Some subjects, such as laser-plasma interactions and high energy density science, are taught across a number of sub-departments.

In addition, the sub-department's journal club focuses on recent research highlights in atomic and laser physics, quantum technologies, and laser-plasma interactions. Active participation is compulsory for first year graduate students. Many other opportunities exist to attend training courses outside the sub-department.

Supervision

For this course, the allocation of graduate supervision is the responsibility of the Department of Physics and it is not always possible to accommodate the preferences of incoming graduate students to work with a particular member of staff. Under exceptional circumstances, a supervisor may be found outside the Department of Physics.

Students should expect to interact with supervisors regularly, eg weekly or, in some cases, monthly.

Assessment

Continuation beyond the first year is dependent on successful participation in the graduate course and on original research documented by a written report. Examination of the research element is by viva at the end of the first year.

Changes to courses

The University will seek to deliver this course in accordance with the description set out above. However, there may be situations in which it is desirable or necessary for the University to make changes in course provision, either before or after registration. These may include significant changes made necessary by a pandemic (including Covid-19), epidemic or local health emergency. For further information, please see the University's Terms and Conditions (http://www.graduate.ox.ac.uk/terms) and our page on changes to courses (http://www.graduate.ox.ac.uk/coursechanges).

Expected length of course

	Full Time Only
Expected length	3 to 4 years

Costs

Annual fees for entry in 2022-23

Fee status	Annual Course fees
Home	£8,620
Overseas	£28,560

Further details about fee status eligibility can be found on the fee status webpage (http://www.graduate.ox.ac.uk/feestatus).

Course fees are payable each year, for the duration of your fee liability (your fee liability is the length of time for which you are required to pay course fees). For courses lasting longer than one year, please be aware that fees will usually increase annually. Information about how much fees and other costs may increase is set out in the University's Terms and Conditions (http://www.graduate.ox.ac.uk/terms).

Course fees cover your teaching as well as other academic services and facilities provided to support your studies. Unless specified in the additional cost information (below), course fees do not cover your accommodation, residential costs or other living costs. They also don’t cover any additional costs and charges that are outlined in the additional cost information.

Graduate students who have reached the end of their standard period of fee liability may be required to pay a termly University and/or a college continuation charge.

The University continuation charge, per term for entry in 2022-23 is £548, please be aware that this will increase annually. For part-time students, the termly charge will be half of the termly rate payable by full-time students.

If a college continuation charge applies (not applicable for non-matriculated courses) it is likely to be in the region of £100 to £600 per term. Please contact your college for more details.

Additional cost information

There are no compulsory elements of this course that entail additional costs beyond fees (or, after fee liability ends, continuation charges) and living costs. However, please note that, depending on your choice of research topic and the research required to complete it, you may incur additional expenses, such as travel expenses, research expenses, and field trips. You will need to meet these additional costs, although you may be able to apply for small grants from your department and/or college to help you cover some of these expenses.

Living costs

In addition to your course fees, you will need to ensure that you have adequate funds to support your living costs for the duration of your course.

The likely living costs for 2022-23 are published below. These costs are based on a single, full-time graduate student, with no dependants, living in Oxford. We provide the cost per month so you can multiply up by the number of months you expect to live in Oxford.

Likely living costs

	Likely living costs for 1 month		Likely living costs for 9 months		Likely living costs for 12 months	
	Lower range	**Upper range**	**Lower range**	**Upper range**	**Lower range**	**Upper range**
Food	£290	£410	£2,610	£3,690	£3,480	£4,920
Accommodation	£680	£810	£6,120	£7,290	£8,160	£9,720
Personal items	£135	£260	£1,215	£2,340	£1,620	£3,120
Social activities	£45	£120	£405	£1,080	£540	£1,440
Study costs	£45	£100	£405	£900	£540	£1,200
Other	£20	£55	£180	£495	£240	£660
Total	£1,215	£1,755	£10,935	£15,795	£14,580	£21,060

When planning your finances for any future years of study at Oxford beyond 2022-23, you should allow for an estimated increase in living expenses of 3% each year.

More information about how these figures have been calculated is available at www.graduate.ox.ac.uk/livingcosts.

Document accessibility

If you require an accessible version of the document please contact Graduate Admissions and Recruitment by email (graduate.admissions@admin.ox.ac.uk) or via the online form (http://www.graduate.ox.ac.uk/ask).