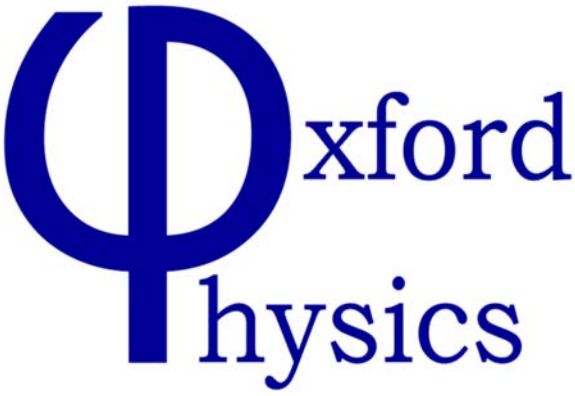

THE PJCC FRESHERS' GUIDE

2020-21

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PJCC CHAIR 2019-20

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INTRODUCTION

Dear New Physicist,

Welcome to the University of Oxford! Congratulations on surviving your school and getting into the University – just making it this far is an achievement you should be proud of! Physics is a challenging but incredibly rewarding subject and hopefully you will enjoy your time here, both as a physicist and as an Oxford student. There is such a range of things to do and so many friendly people to talk to, that it's difficult not to have a good time. However, if you do find yourself struggling, please remember that varying forms of support exist at every level of the university, from the college up.

Although you will undoubtedly be overloaded with introductory guides, hopefully this one will be of some use, as it's designed to give you an overview of what the course involves and aims to give you some useful advice and insights into the course and the university as a whole. A more detailed explanation of the structure, syllabus and assessment of the course is in the Undergraduate Course Handbook, which is available in the Undergraduate Students page of the physics website (http://www2.physics.ox.ac.uk/students/undergraduates) once you get to Oxford. It's strongly recommended to have a look through it, both during Freshers' Week and again later whenever you have questions about the course – you'll be surprised by how many answers it contains! Printed copies are no longer distributed, but if you'd like one, contact Carrie Leonard-McIntyre, the Assistant Head of Teaching (carrie.leonard-mcintyre@physics.ox.ac.uk).

An extended version of this guide you're reading now can be found on the PJCC (Physics Joint Consultative Committee) webpage http://pjcc.physics.ox.ac.uk), under "Resources".

Please remember that the details contained in this guide apply to the course during usual years. Changes caused by global events will not be documented here, because this guide would then become out of date almost immediately.

I hope you find at least some of this useful and wish you all the very best of luck with your course,

Ludo Fraser-Taliente (PJCC Chair 2019-20)

The views and opinions expressed in this guide are those of the PJCC, and not those of any college, department, or the University.

The present author, Ludovic Fraser-Taliente, accepts full responsibility for any mistakes and inaccuracies contained within.

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TEACHING METHODS

Terms in Oxford (*Michaelmas* – autumn, *Hilary* – spring, *Trinity* – summer) are very short compared to other universities (only eight weeks long!) and so the workload is intense, and the pace is *very* fast. Therefore, it's easy to get left behind – all it takes are a few rehearsals, rowing outings, debating events or bops (college parties) too many, in addition to lab work and lectures and suddenly a seven day week seems very short. You can have fun and do physics (the two aren't mutually exclusive[1]!) but it's vital that you're organised with your time. You'll probably have to do about 1.5 problem sets each week (i.e. around 3 every fortnight), so set aside plenty of time to complete them as they form the basis of your tutorials, which are undoubtedly the most important aspect of your education here.

In between terms are periods of time known as the *vacations* – so called not because of a preference for American parlance, but because they are just times when you have 'vacated' the University. It's *very* important to make sure you do relax and get some respite from the rush of term. However, you will need to go over the work done during the previous term and perhaps read about the topics to be covered during the subsequent term – this is perhaps the reason that they are not called holidays. Colleges normally provide a focus in the form of internal exams (known as *collections*) at the beginning of each term. These have no bearing on your final degree – they are simply to help you and your tutors find out how you're progressing, as well as allow you to practise for your real exams at the end of the year, as they're usually almost identical in format. The seriousness of these collections depends entirely on your college: some may make you do them again if you do badly, however with adequate preparation, they shouldn't be something you have to worry about!

TUTORIALS

Oxford is a collegiate university and so, other than in lectures and labs, most of your teaching will be based in your college. No two colleges operate in exactly the same manner and the best way to find out exactly what to expect is to talk to your tutors and physics students in the years above at your college. However, there are many similarities between the colleges so here's a general overview of how tutorial based teaching at Oxford works:

[1] For a fusion of fun and physics (#PhysicsPhun), you might want to join our Physics Society, which puts on weekly talks and arranges social events. For more information: http://www.physsoc.co.uk/.

Tutorials (or “tutes” as they are often known) are an opportunity for you to be taught by a member of the physics department, usually a specialist in the subject. The exact structure and nature of the tutorial varies from tutor to tutor (who can be anyone from a graduate student to a world-leading professor, either from your college or elsewhere in the department), but they mostly involve going over work which you will have handed-in in advance to be marked. This means that your tutorials will differ quite significantly from those of many of your fellow students, at least in the early years of your degree, as the bulk of the tutorials will have a relatively rigid structure, going through each question of the problem sheet that you handed in. In other subjects, they have a little more scope for changing the direction of a tutorial. Though not a bad thing, this is a difference to be aware of.

Oxford Physics problem sets probably won’t be much like the school homework you’ll be used to – for starters, they’re a lot more time consuming. Be prepared to spend up to 8 hours working on just one problem set – infrequently less, and often more. The reason they take so long is that solving the problems is how you actually learn the material you’ve covered. With the exception of some “book-work” questions, you won’t be regurgitating lecture content in your answers; you’ll be applying the abstract material which you’ve been taught to solve a problem which you almost certainly won’t have seen before. Lectures don’t teach you how to tackle the specific problems - they just give you the knowledge you’ll need to attack those successfully. Fortunately, the tutorials *will* teach you how to tackle problems.

WHAT EXACTLY IS A TUTORIAL?

A tutorial basically consists of an hour-long (or more) meeting between two or three students and a tutor, who is a practising physicist, either from your college or elsewhere in the physics department. You will mostly go over work handed in beforehand, but sometimes you will look at work to be covered in forthcoming lectures. Problem classes (normally all the physicists in your year at college and a tutor) are also held on an irregular basis, perhaps for example to go over collections. During the first year you will usually have about two tutorials per week (one in physics and one in maths).

Tutors organise their tutorials in different ways. Some will ask you to attempt questions on the board, others may give a mini-lecture of their own. Many tutors stick closely to the question sheets handed out in lectures, whereas some set their own questions. They may opt to introduce new material themselves or go over a technique a lecturer has covered from a new perspective.

One of the beauties of the tutorial system lies in its flexibility. Your tutor will get to know you quickly and will be able to see where you are having problems, directing you as necessary. With only one

or two other students present it is much easier to ask questions without feeling as if you are holding someone else up. Try to make use of this as much as possible – do not worry that you are wasting your tutor's time, they are there to help and want you to do well! Often a tutor can give you a reply to a question immediately for which you might otherwise have spent hours of searching in books or on the internet to find the answer. Having access to the core textbooks is very important, as tutors will often refer you to a chapter which is particularly relevant. If you think of something outside a tutorial, don't be afraid to email your tutor and ask them. They might e-mail you a response or give you an answer in person during your next tutorial.

Another advantage of the flexibility of the tutorial system is that if you are unable to make a tutorial (due to illness or otherwise), or find it difficult to hand in a piece of work on time for the same reasons, contact your tutor as soon in advance as possible and they should be able to re-arrange the tutorial or give you an extension on the work, so that you can catch up. Each tutor has a different policy on alterations to the schedule, so it is a good idea to find out what your tutors prefer.

Finally, in addition to being an excellent way of learning the course material, tutorials are an opportunity to talk with experienced physicists, often experts in their field, and learn about aspects of physics that may be completely off the course. These extra-curricular discussions are usually fascinating and provide you with a wider view of physics in general. If you ask them, your tutors will probably happily tell you all about their research and might also show you around their lab and even help you to find a vacation placement to get a better insight into what actual research is like.

LECTURES

For most students, the lectures and lecture notes will be your primary source of information, since they cover all the material more concisely than any single textbook. Attendance is hence very much advised (but not compulsory). These lectures are all held in the physics department (in the Clarendon Laboratory), mostly in the mornings and starting on the hour. **This may be different in 2020**. Recordings of lectures can be found online: https://weblearn.ox.ac.uk/portal/site/:mpls:physics:teaching:undergrads:tmaterials:physyear1

The online lecture timetables (www.physics.ox.ac.uk/lectures - use your department account, not your SSO) have links to the lecturers' webpages, where you may find supplementary content. The doors to the Clarendon Laboratory are open between to undergraduates between 08:30 to 17:00. You need your Bod (University) card to get in, so don't forget it!

Once inside the lecture theatre, you'll join the 170 or so other first year physicists from all colleges for the lecture. The lecturer will stand at the front and explain their topic, perhaps with the aid of slides on a projector, but more usually (especially in the years that follow) by just writing on the blackboard. Lecturers will vary in how they provide notes (if they do at all). Some produce reading lists with references to specific books (and chapters within them) and an accompanying set of detailed notes whereas others may just summarise the key points and so you'll need to attend the lectures to see the details. All lecturers' supplementary material may be found online at the same address as the timetable – just click on the lecture and locate the 'Lecture Materials'.

You'll receive so much information in lectures that you won't be able to remember it all without taking some form of notes. It is up to you if you prefer to annotate the existing notes during lectures, or make your own entirely, whether handwritten or - in LaTeX the beautiful typesetting system. Essentially all of the content you will see during your degree will be written up in LaTeX[2], so it is certainly worth learning – https://latex-project.org. The best thing to do is to go to the first few lectures to get a feel for what they are like and subsequently act based on your own preferred style of learning. However, don't get so caught up in the note-making that you lose track of what you're actually being taught.

Question sheets are sometimes handed out in lectures but should always be available online on the lecturer's web page. These are exercises based on the material covered which your tutors will almost certainly set you for tutorials. Entire questions may be devoted to topics that the lecturer only spent five minutes on, so it's almost always worthwhile going back over your lecture notes (ideally with another textbook) to check that you've fully understood everything. **As many lecturers point out, the lecture notes are not designed to teach you absolutely everything you should know – the use of other resources, particularly their recommended textbooks, is vital.** If you haven't understood something, feel free to ask a question (or two!) in a tutorial where your tutor will explain the topic, even if it's not directly related to this week's problem set, or email directly. Moreover, different physicists will usually explain the same topic in slightly different ways, which is very useful if you had trouble understanding it the first time.

At the end of each term you must fill out an online lecture feedback questionnaire. The results are taken into account by the individual lecturers (and they *will* make changes according to them) and are discussed with the faculty in the PJCC meetings (more on these later!) You should use this chance to improve the course – written comments are particularly useful.

LEARNING FROM TEXTBOOKS

[2] Pronounced *lay*-teck, not latex – do not mix these up!

A very important skill that you need to acquire at university is independent learning. It becomes more essential as the course progresses so try to learn it early on, and do not make the mistake of relying only on lectures. To re-iterate the bolded section above, reading the relevant sections of various textbooks will give you a deeper understanding, a different perspective, and will ensure you know the topic more thoroughly. Sometimes, new topics must be learned entirely from textbooks; say, for a practical, or if you have missed several lectures through illness. Sometimes, tutors will set work before the relevant lectures have been given. This is a good opportunity to read ahead and means that you learn a lot more when the actual lecture detailing the work comes up.

Your tutors, older students, and lecturers won't hesitate to recommend books if you ask (and even often if you don't!) but don't be afraid to deviate from their suggestions and use the books that you like best.

LEARNING FROM OTHERS

Last, but not least, it can be a good idea to meet up with other physicists from your college or year in general to go over the material covered in the course. You may notice that some problems can be solved much more quickly this way and that explaining a topic to others helps you to get a better idea of it yourself and realise where your weaknesses are. On the whole, physics students tend to do much better when they work together.

Moreover, always remember that older physicists in the years above you are on the same course as you! They have walked where you will walk, attended the same lectures that you've going to go to, and have done the same problem sheets that you will be doing – so they're in a very good position to offer advice on any questions you might have about the course or specific queries you might have about physics. There is also a thriving graduate community in the physics department and your college will most likely have some graduate physicists associated with it (some of whom will be products of the Oxford undergraduate physics course themselves). Some colleges even have a graduate mentoring scheme set up but regardless of whether there is a formal system, don't forget that graduates are (most of the time!) always happy to help you if you're stuck.

THE COURSE

Full descriptions of the courses and the exam papers are given in the Undergraduate Physics Handbooks, (although attending the lectures soon gives you a taste of what each one is like). The handbooks gives a list of topics on each course that are examinable (the syllabus). It's worthwhile to get acquainted with the syllabus, as some lecturers will dip into areas of physics which, while interesting, are non-examinable, and the lecturers may not make it extremely clear when they're doing this. It also helps you determine what you do and don't yet know when you start revising.

Previous exam papers can be found on www.physics.ox.ac.uk/expapers (you'll need your Oxford SSO [single sign on] to log-in) for examples of what sort of problems you'll be expected to solve. However, examiners and the syllabus can – and often do - change from year to year, so don't be surprised if some of the older questions appear totally irrelevant and unfamiliar. The department does not provide solutions to these, for an assortment of very good reasons, including the fairly fundamental one that being able to judge the correctness of your solution is one of the most important skills a physicist can have – after all, no-one at CERN gets a solution booklet for the universe.

FIRST YEAR

The first year of the course is *very* mathematical, which may come as a shock, particularly compared to what you may have been used to at school. What you are effectively doing is learning a language, which is used in the rest of the course to model the world we see around us. We then solve these models and subsequently interpreting the solutions gives us some understanding of how the world works. You should always try to then see the physics behind the equations and results you get, and not just behave like a human calculator. To help you do this, during the first year, you also learn the foundations of some of the most important branches of physics (namely classical mechanics, special relativity, optics and electromagnetism) which will crop up again and again as you progress further in physics. Getting the first-year material cemented firmly in your mind will therefore help you enormously in future years.

Examination at the end of first year is in the form of exams known as "Prelims", short for "Preliminary" examinations. These are not classified, meaning you will just get a percentage mark rather than a *classification*, which is one of a 1st, 2i, 2ii, or 3rd. They do **not** count towards your final classification, but you do need to pass them to continue. If you perform very well (normally roughly in the top sixth of the year) you may be awarded a *Distinction*. Some colleges may also award an exhibition or scholarship to the tune of £50-£200 (depending on your college) on performance in this examination. However, on the other hand, a minority of physicists will fail one or two papers if they miss the pass mark (around 40%) but you get a chance to retake them in September. Students will be *sent down* (made to leave) if they fail these September resits. Obviously, spending the summer revising for exams that you must pass to stay in Oxford cannot be pleasant, so do take Prelims seriously. They're also very good practice (you even have to wear

your academic dress, called *sub-fusc*) for the exams that you'll take at the end of all the later years of your course, which will count.

The papers are as follows:

Compulsory:

CP1: *Physics 1* (mechanics and special relativity)

CP2: *Physics 2* (electromagnetism, circuit theory and optics)

CP3: *Mathematical Methods 1* (differential equations, complex numbers, and matrices)

CP4: *Mathematical Methods 2* (calculus, vector calculus and waves)

Short Options:

S01: *Functions of a Complex Variable*

S02: *Astrophysics: From Planets to the Cosmos*

S03: *Quantum Ideas*

Students take all four compulsory papers and then choose one of the short option papers. You will not receive tutorials for your Short Option, which is intended to add breadth to your course. The astrophysics option may be included as part of your second year and Functions of a Complex Variable may be done as part of any year whereas the Quantum ideas course is only available in the first year, but obviously you cannot take the same course twice. If you're not sure which to pick, your tutors will be happy to offer their advice as to which one they think will be best for you. Some information about the different options can be found online at https://pjcc.physics.ox.ac.uk/resources/guide/ and the syllabuses, just as for the compulsory papers, are found in the Undergraduate Handbook.

Each compulsory paper lasts 2hr 30mins and consists of a Section A, which carries 40 marks and in which every question must be answered, and a Section B, in which you answer 3 of 4 more in depth questions carrying 20 marks each. Every short option paper is structured similarly: you must offer solutions to 2 of 3 questions in 1hr 30mins.

SUBSEQUENT YEARS

During the second year (Part A) and third year (Part B) the course concentrates on giving you a rigorous grounding in the standard areas of physics, but now focusing more on the physics itself rather than the maths underlying it. However, mathematics is still used extensively (but as a tool rather than for its own sake) and so there are still mathematical lecture courses in the second year.

Exams are in Trinity Term of the second and third years, covering the Part A and Part B syllabuses respectively. They are usually quite late on compared to many other subjects, to give you more time to revise, though the precise timetabling of the exams is never guaranteed.

For Part A there are 3 compulsory papers:

A1: *Thermal Physics*

A2: *Electromagnetism and Optics*

A3: *Quantum Physics*

For Part B, you can study a broad range of topics, from particle physics to general relativity.

In both 2nd and 3rd year, you must take a short option paper but this time, you can choose from a wider range of short option topics such as Classical Mechanics, Energy Physics, Biological Physics, Exploring Solar Systems, History of Science or even a language option! Only Quantum Ideas is restricted to the 1st year.

In the Part C course, taken in the 4th year of the MPhys, you take two courses in a specialised area of physics (chosen from a list of 7) and carry out an extended research project. You'll cross that bridge when you come to it!

You will not have to choose between the BA and MPhys until after the results of the Part A exams are published. The department recommends that you should achieve at least 2:i in Part A to be well prepared for the MPhys degree.

There is also a 4th year-only course for those more mathematically inclined – the MMathPhys – which is run jointly with the maths faculty. More details may be found online at

https://mmathphys.physics.ox.ac.uk/ but even if you're interested, you don't need to worry about this until your 3rd year!

Of course, you'll find out all about the structure and content of the later years in much more detail as you progress through the course.

THE PRACTICAL COURSE

Physics is a (somewhat) practical subject, so doing experiments is inevitably an important part of the physics course in Oxford. This is just an outline of the Practical Course, but you'll be given a much more comprehensive guidebook by the Department during the first week of term, and there will also be a safety lecture regarding practicals.

Practicals are done in the same pairs each week, usually with someone from your college, although if your college admits an odd number of students you may be working with someone from another college. Working in pairs really helps; it gives you someone to talk about the experiment with and makes setting up the equipment a lot easier.

The practical labs are very different from the experiments you will have done at school. In the first year you will spend a full day performing an experiment, rather than just an hour or so, giving you enough time to explore the experiment in some depth. In further years, this is extended to two days for one experiment.

For each practical, you are provided with a detailed script including instructions telling you what to do, technical details about how to set up the apparatus, all the relevant theory, and questions relating to the theory. All the scripts can be viewed online and printed; it's essential to read though the script *before* you turn up at the lab on the day so that you have an outline of what you will be doing. This will help save time at the beginning of the day and increase your chances of finishing early. **In some labs, you may not be allowed to start until you have read the script, as it may be too dangerous otherwise.**

The labs are staffed with 'demonstrators' and a few senior members of staff, who will sign off your experiment to prove you've completed it. Demonstrators are usually graduate students from Physics, and many will have gone through the Practical Course as undergraduates. They are there

to answer questions, explain things you don't understand, and help set up your experiments. Frequently, the experiment will involve physics that you have not yet studied, so thankfully the demonstrators are understanding, and they will accept that it may take you a while for you to get your head around it. However, just like in the real world, the advice you are given in the script may not necessarily be entirely correct, and your equipment will not always work perfectly – unfortunately, dealing with this is a critical part of becoming an experimental physicist.

You can give feedback about the different practical labs at any time, and comment on individual experiments (using "SPIRe" – a construct which you will get to know all too well very soon). Any (constructive) comments, criticisms and ideas left here, or on the physical pieces of paper you are given, will be taken into consideration to improve the practical course. Any feedback left will also be visible to the other students, and this can be very useful when deciding which practicals to choose, so please do fill in your comments.

FIRST YEAR

During the first year you will spend one day in the labs each week, plus some time spent in the computing laboratories. The requirement for practical work in the first year is usually 17 days, and ideally you won't have to do any practicals in Trinity Term. Try not to get behind with practicals; if you miss one you can catch up at the end of Hilary Term, but you don't want to cut it too close. The Prelims practicals are grouped into 5 different areas: Optics, Electronics, Electrostatics and Magnetism, Computing and "General" (which is mostly Mechanics).

First year experiments are done on either Thursday or Friday (the day depends on your college) between 10:00. and 17:00. It is not a pressurised environment so if you have been working well during the day then you won't be made to stay after 17:00. and if you manage to finish it beforehand, you can go straight home. However, you will have to do a little more work for two practicals, which you will discuss in more detail with your demonstrator after writing a report – for more details, check out the Practical Guide found here: http://www-teaching.physics.ox.ac.uk/practical_course/HBPrelims.pdf .

Note that this may be different after 2020.

SUBSEQUENT YEARS

In the second and third years you spend two days every fortnight in the labs, so that you can do longer experiments. You alternate between practical weeks (which can be fairly hectic!), and non-practical weeks. It's worth asking your tutors if they'll take this into account when arranging tutorials as they're likely to be accommodating.

The choice of practicals is wider than during the first year, so you can pick those which you find most interesting; the only compulsory lab is electronics. You will also complete an extended project during the final year of your degree.

There are a number of possibilities to replace some practicals by other courses; for example, by taking an extra 'Short Option' paper or by taking the 'Teaching and Learning Physics in Schools' option. This involves working in a local secondary school helping to teach physics; more information will be provided in a talk closer to the time.

COMPUTING

It is hard to overstate the importance of computer programming in modern physics; virtually every active researcher in physics uses programming on a regular (if not daily) basis. You will soon discover that the number of physics problems that can be solved by hand is a very small subset of what physicists have to contend with, so an understanding of computing is absolutely essential.

You will have a few introductory lectures on computing, as well as some projects to complete as part of your first-year practical work. The language currently taught by the department is MATLAB, which you can download onto your own computer once you have your IT login details. Working physicists often write code in a variety of languages, so I encourage you to explore the world of computer programming in as much depth as you can, particularly if you plan to continue in physics after your degree.

However, do not rely on these to teach you alone. In computing, perhaps more than in any other part of physics, **the only way to learn it is to do it**. Computing requires a whole new way of

thinking; you must learn to think and work in algorithms rather than in equations. While the course at Oxford does the best it can, it is impossible to teach a level of competence in computing in just a few lectures and labs. Furthermore, probably the most essential (and hardest) part of programming is debugging, which is a skill that is very difficult to teach, especially in a group environment. It is therefore essential that you practice programming in your own time, making and finding your own mistakes.

LIBRARIES AND BOOKS

There is no single textbook that covers all the material on the course so it is necessary to use a variety of books for each aspect of the course, some of which, although recommended by tutors and lecturers, go well beyond the level required. You will usually have a long reading list of recommended books for each topic, but fortunately, you won't have to read all of them. A few core texts might be marked as essential, but otherwise, you're free to choose whichever book (or books!) covers the material in a manner most suited to you. It's worth having a look through a few before deciding which to get. Once you've decided which books you like, there are multiple options available when it comes to acquiring them: buying a physical copy; using the university or college libraries (including their online options – you will be told about SOLO during your library induction); or using digital copies.

Oxford's extensive library system is unique (apart from maybe "the other place"[3]) and if your college library is good (and most, if not all, are), you will rarely need to spend money on books. And of course, if your college library doesn't have the book in stock, the main y library (Bodleian Library) will do. Oxford, being one of the legal deposit libraries of the UK, has a copy of every book published in the UK, and many others besides. However, if you do find it necessary to buy a book, try to get it in the secondhand section of a bookshop (Oxford is not lacking in bookshops) or from someone in a higher year. Some colleges may repay you some of the cost of buying books - so keep the receipts.

[3] A snarky term for Cambridge, due to the centuries-old rivalry between it and Oxford.

COLLEGE LIBRARY

Your college library should have most of the books you need for the course and will stock multiple copies of the most frequently used. Your tutor or librarian will usually order more copies if there are not enough, and you can request books to be bought that are not stocked.

OTHER

These aren't the only two libraries available to you (students who are members of the Oxford Union can use and borrow from the Union Library and all students can use the main Bodleian library, although they can't borrow from it) but they are the two most used by physics students. This being Oxford, of course, there are a huge number of other libraries that exist - most of which look utterly gorgeous, and all of which are worth investigating. In addition to being an invaluable source of books, they also provide a quiet environment in which to work.

Figure 1: Bodleian logo

PREPARATION OVER THE VACATION

You may have been given vacation work and a reading list as part of the recommended preparatory work; try to finish your vacation work before you arrive in Oxford – there are a lot of things to do in "Freshers' Week", most of them more fun than a problem sheet! It is useful to loan or buy at least some of the books from the list and begin reading them. **Mathematical Methods for Physics and Engineering** by *Riley, Hobson and Bence* is recommended by most tutors and is particularly useful as it covers almost all the maths you will ever need, but an alternative text,

Mathematical Methods in the Physical Sciences by *Mary Boas*, which some students prefer, is also a good place to start.

In addition to introducing yourself to one of these books, is helpful to read over your A-Level notes, especially those on maths, and re-familiarize yourself with topics like integration, differentiation and so on since development of these will be one of the main features of the first year course. Be aware that you won't be given anywhere near as comprehensive a formula sheet for your Prelims compared to at A level, so make sure you know (or know how to derive) all those standard integrals/derivatives!

If you didn't take Further Maths A-Level you should be aware that while the first two weeks of lectures will be revision for most, they will probably cover new topics for you, so you will have to work hard to make sure you grasp these fully, as they'll form the foundations of the rest of the year's work. Therefore, it's useful to read some Further Maths books if they are available to you (for example, the Edexcel Further Pure 1, 2 & 3 textbooks). If you find yourself struggling, you should ask your tutor for help or advice.

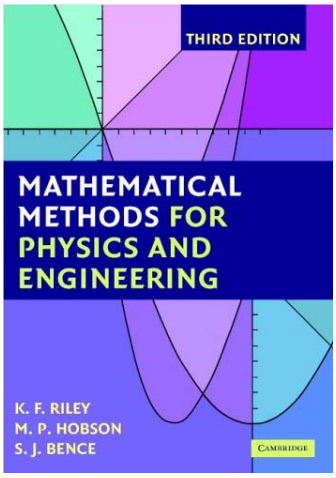

Figure 2: RHB - your new best friend?

CLUBS AND SOCIETIES

Oxford is a place where every society imaginable exists, in one form or another. For a list of university-wide clubs and societies, see https://www.ox.ac.uk/students/life/clubs. This section exists to draw your attention to some of the ones you may be interested in as physicists, but remember that, if you have the time, there's nothing wrong with diverting yourself with other pursuits while you are here.

As mentioned earlier, there is a thriving physics society in Oxford https://oxford-physsoc.com/ that meets regularly for lectures and social events. In addition, there's a scientific society too (OUSS) that is one of the oldest undergraduate scientific societies in the world. They not only organise speaker events but also occasionally organise tours to various scientific establishments.

Within the physics department, there are two major societies that you may not have heard of: the Oxford Women in Physics Society and the Physics Joint Consultative Committee (PJCC), the latter of which designed this guide!

OXFORD WOMEN IN PHYSICS SOCIETY

Oxford's Women in Physics society was set up a couple of years ago in order to promote career development of women in physics, from undergraduates, through to graduates, and onto to academia, supporting them at every step of the way. The society provides an opportunity for women across at all these different stages to interact, get together and benefit from a pool of role models and mentors.

Not only does the society have an active mentoring scheme, but they also host tea sessions, lunches, and banquet dinners. They also were key in organising and hosting the UK's first ever Conference for Undergraduate Women in Physics in March 2015, which was a resounding success!

For more details, click on the links above or check out their website, where you can find contact details of the committee. The current President is Anna Marchant (anna.marchant@physics.ox.ac.uk) and the society also has specific undergraduate representatives, all of whom I'm sure would be happy to answer any questions you might have.

THE PHYSICS JOINT CONSULTATIVE COMMITTEE (PJCC)

The PJCC meets twice a term (at a lunchtime in second and seventh weeks) and consists of a number of undergraduate student representatives (reps), ideally at least one from each year and a few others with specific tasks, like representing Physics & Philosophy students. It meets with a few key members of staff to discuss ways to improve the Oxford undergraduate physics course, covering issues such as teaching, changes to the syllabus, examination procedures and most

importantly, addressing any suggestions or complaints which students (both on and off the committee) have raised. The PJCC is always chaired by an undergraduate student, who further represents the students' views by sitting on various other committees and raising any relevant points there.

There are many ways to contact us, the student members: you can use the form on the webpage (https://pjcc.physics.ox.ac.uk/contact/); contact the chair by sending an e-mail to pjcc_chair@physics.ox.ac.uk; email us by clicking on our names on the Committee page; or simply talk to your "year rep" or someone else on the committee directly. All your comments will be taken seriously and can be handled anonymously if you want to. If you are interested in playing a bigger role and directly participating in PJCC meetings as a committee member (where you'll get free sandwiches!), please contact the PJCC Chair at the above email.

It is important that people contact us so that we can get a balanced set of views. If you have a problem or a good idea, please do let us know – that way things can be improved (or we can at least give you an explanation if they can't!).

Even if they don't have any other involvement in the PJCC, each term every physics student fills in a web-based questionnaire about the lectures they have attended. The results, including marks for various categories and a summary of the comments for each lecturer, are collated and passed on to the department. The comments are not displayed and remain anonymous, so please take this opportunity to tell us what you think. The completion of these questionnaires is extremely important for the department, as the results are taken seriously. The numerical feedback results, along with the minutes of previous meetings, are displayed on the webpage.

The PJCC webpage (https://pjcc.physics.ox.ac.uk/) also contains useful links (with reading recommendations, good physics websites and handy programs) and help for finding vacation placements.

EPILOGUE

Well, that's it – Oxford First Year Physics in a nutshell! If you still have question after reading this and the Undergraduate Handbook, then don't hesitate to contact your tutor, the PJCC Chair (pjcc_chair@physics.ox.ac.uk), or Carrie Leonard-McIntyre, the Assistant Head of Teaching (carrie.leonard-mcintyre@physics.ox.ac.uk).

Good luck!

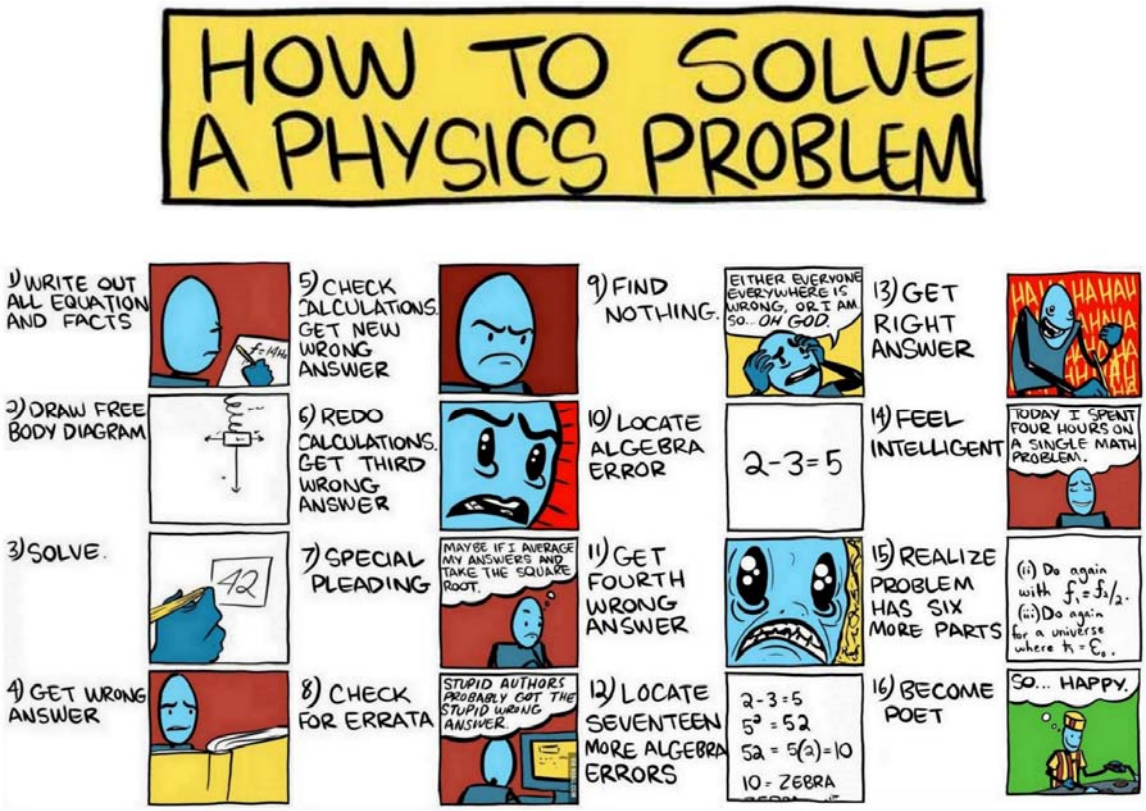

Figure 3: smbc-comics.com