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RESEARCH YEAR

Student Handbook: Notes for Students, Employers and Visiting Tutors

MPhys Physics programmes

Calendar Year 2023

The Mphys Research Year

This handbook explains the main features of the Research Year in the Physics Department. It includes sections directed at specific groups of people – Students, Employers and Visiting Tutors. Nevertheless, most of this booklet should be read by all of those involved.

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List of abbreviations and codes

FHEQ 6	Frameworks for Higher Education Qualifications level 6, equivalent to the final year of a Bachelors level degree (in which PHY3062 sits)
FHEQ 7	Frameworks for Higher Education Qualifications level 6, equivalent to Masters degree level or the final year of an integrated Masters level degree (in which PHYM052 sits).
PHY3062	the Academic module comprising the RYID
PHYM052	the Academic module comprising the RYD
RS	Research Supervisor
RY	Research Year
RYD	Research Year Dissertation (used to refer both to the module PHY3062 and the report within it, depending on the context)
RYID	Research Year Interim Dissertation (used to refer both to the module PHY3062 and the report within it, depending on the context)
UoA	Unit of Assessment. A formal assessment unit within a module, which may comprise multiple components marked separately. If a module is failed, then students must be reassessed on all failed UoA's within the module and each 2nd attempt at a UoA is capped at the pass mark (which depends on the level).
VT	Visiting Tutor

SECTION 1 GENERAL INFORMATION

The University of Surrey Master's in Physics (MPhys) Research Year

Whereas a University degree in itself opens the door to many careers, the maturity and experience gained during a Research Year provide an extra dimension to the qualification.

The Research Year developed at Surrey is a period of assessed research lasting up to one calendar year culminating in the completion of a dissertation, which gives students insights into their subject and their own career potential which could not be gained by academic study alone. The Research Year is an integral part of the extended undergraduate Master's degree programme. While on placement, students are enrolled in University of Surrey modules, spanning year 3 (FHEQ level 6) and year 4 (FHEQ level 7) activities.

Prior to the start of the Research Year, a meeting is arranged early in the fourth semester (~March/April of the 2nd Year) with the Mphys Research Year Director to discuss each student's capabilities, interests and career ambitions and the possible areas where students may be placed appropriate to their programme of study. This follows the previous year's Mphys students presenting their results in the Mphys research year symposium which is attended by the 2nd year students who are planning to go on Mphys placement the following year. The University has developed a network of contacts in the UK and overseas among leading industries, research centres and professions. These contacts are the principal hosts of our placement students.

Once an appropriate placement has been found, a programme of work for the student is arranged with the employer. The student, although remaining an enrolled student and the responsibility of the University, becomes an employee of the host institution, normally receiving a stipend or salary and working and living away from the University environs. Students meet their Surrey based Visiting Tutor on at least two separate occasions so that progress can be assessed and monitored, and a close liaison established with the employer. The expectation is for two visits during the placement and sometimes one meeting in January prior to finalising and the submission of the final dissertation.

On return to the University for the final semester of formal study of their degree course, students present a seminar on their research year work to physics academics, other Mphys students and invited guests.

SECTION 2 STRUCTURE AND ORGANISATION

The Research Year is spent in a research group at a University or laboratory, either in the UK or overseas. Formally, it begins in week 1 of the second semester of the third year of study and continues until the end of the first semester of the following academic year. The length of time spent physically on placement will typically be from the beginning of this period (mid-February) until the end of December. It is often not possible to arrange for the start and end dates to exactly coincide with our semester structure. The minimum length of study for a Research Year is 30 weeks (corresponding to two full semesters of full-time study).

The year is spent working on a project under the supervision of the group at which the placement is occurring. Parts of the placement, along with some other enabling work, form the required Surrey modules which contribute the necessary credits to a master's level course. This requires 60 credits at Level FHEQ6 and 60 credits at Level FHEQ7, as shown in Table 1.

Table 1. Time structure

Semester 6 level FHEQ6 (second semester of 3rd year, Feb-July)						**Semester 7 level FHEQ7** (first semester of 4th year Aug-Jan)					
PHY3062: Research Year Interim Dissertation (RYID) 60 credits						**PHYM051**: Research Year Dissertation (RYD) 60 credits					
Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Start		1st visit (normally Apr; Jun at latest) Project Plan due prior, Oral during.			RYID due		2nd visit (normally Sep/Oct; Nov at latest)			Ret'n	RYD due +Oral

The coordinators of these two modules are listed at the front of this Handbook. The full and definitive module descriptors are found at http://catalogue.surrey.ac.uk/. A description of the year structure, and how the modules fit in to it is summarised here.

Starting in the spring semester (from early Feb) at the beginning of the Research Year, students are enrolled in the module PHY3062 (Interim Dissertation). This module is designed to get the student familiar with the nature of the placement institution, the nature of research work taking place there, and the usual form of disseminating that research (e.g. internal reports, or papers prepared for publication in the scientific literature). It involves demonstrating preparation for the research portion of the placement year, with a review of relevant literature and evidence of other preparatory aspects of the main project as appropriate (e.g. experimental and technological preparation and understanding of background physics). It will substantially consist of activities forming a necessary part of your host–guided placement. The dissertation module, PHYM051 requires writing a substantial dissertation in which the original research element of the Research Year is demonstrated.

From experience, students will generally spend the first 2–3 months becoming familiar with the work environment, the nature of work being undertaken in the research group and in acquiring the appropriate research skills (e.g. specialist laboratory and/or computing). Additionally, prior to the main dissertation project, students undertake directed reading and preparatory work. The students will be expected to fulfil an appropriate role in the research group, presenting work when necessary orally and in report form, interacting with other group members and taking appropriate responsibility for their work.

The work to be done by students will be dictated by the particular research group. Students will construct a detailed project plan based on their understanding of the research to be carried out, and this will be discussed with a nominated Visiting Tutor from the Physics Department and with their Research Supervisor during the first visit (usually in March/April). On this visit, students will make an Oral Presentation about the background to the project. The general aspirations of the student and the Physics Department for the year would also be discussed at this visit. Later, at the mid-point of the project (end of July), the student will submit an Interim Dissertation describing the project and the background literature in detail.

In advance of and during the Visiting Tutor's second visit (usually around the end of September, but the dates are flexible to fit in with the activities of each host group), the detailed project(s) the student will be working on for the rest of the year will be discussed and the expectations of the Department as to the student's approach to the project reiterated. As the project proceeds, the Visiting Tutor will take a continuing interest in the project, being kept informed (typically by e-mail) by the student, and will be available to offer advice and encouragement; the Tutor will not usually influence the nature or direction of the project.

Summary of assessments

A summary of the assessments associated with the modules is shown in the table below

Table 2. Assessments Summary (see Appendices and Surreylearn for more details)

Module	**Assessment**	**Weight in Module**	**Deadline (dates are indicative – see SurreyLearn module pages for confirmed dates)**
Semester 6			
PHY3062 – RYID	Project Plan*	5%	1 week before the 1st tutor visit (at the latest, last Tuesday in June at 4pm UK BST)
PHY3062 – RYID	Oral Presentation*	15%	During 1st tutor visit (at the latest last Tuesday in June at 4pm, UK BST).
PHY3062 – RYID	Literature Review	80%	Last Tuesday in July, at 4pm (UK BST)
Semester 7			
PHYM051 – RYD	Dissertation	80%	Mon Week 12 of Autumn semester at 4pm (UK GMT)
PHYM051 – RYD	Oral Presentation	20%	Usually Fri week 15 of Autumn semester at 4pm (UK GMT)

*NB: the Project Plan and Oral Presentation jointly form a single Unit of Assessment.

SECTION 3 THE AIMS AND LEARNING OUTCOMES OF THE RESEARCH YEAR

The most important learning objectives for the initial three–to–four months are that students build up self-confidence in their practical, analytical and/or programming abilities; their ability to communicate; get over their awe of anyone with more experience – realise other people are just as fallible as themselves; realise they can take on responsibility for a task and see it through; realise that they are part of a team committed to research and understanding new things and not just being directed to take an extended lab–project with known outcomes.

Secondary learning objectives are an understanding of; how the research group is structured; chain of command; how the research group decides its research priorities and objectives; relationship to other departments, customers; deadline requirements and quality expectations; how to get authorisation for requests for work by others; how to communicate requests; understanding of computer system, protocols; familiarity with language used, relevant programs. Our experience over many years of one-year placements is that such things are naturally assimilated by students providing they are in an active group – not left on their own with no clear direction or attempt to involve them with the rest of the group. To obviate any such problem the student is visited initially after two-to-three months by the Visiting Tutor (March-April).

Typically, during the later period of the Research Year, students are assigned responsibility for a substantial project which is aimed to be of a standard suitable for publication in an appropriate professional journal (though publication is not a requirement). After a preparatory planning and discussion period the project is worked on for the remaining time. It is expected that the student will approach the project in the manner of a research student, e.g. to take ownership of the project, input ideas, demonstrate initiative and seek out relevant information, to understand that this is an open-ended *research* project whose answer has not already been worked out by someone and written in a textbook.

The learning objectives of acquiring research skills can include careful planning, time scheduling, communication with colleagues and workshops, keeping a detailed notebook, designing and testing equipment, taking and testing data and analysis, planning implementing and running code. The dissertation required at the end of the project, and the interim report, have the objectives of encouraging students to write clearly and express their understanding of the work.

During the Research Year as a whole it is expected that the student will further develop communication skills through participation in group meetings, preparation of in–house reports, giving oral presentations and showing initiative in acquiring any necessary new skills. The oral presentation on return to the University in the final semester is a chance to show their oral presentation skills and ability to think on their feet.

SECTION 4 INFORMATION FOR STUDENTS

The Research Year

The Period of Placement
The Research Year runs for a period of 12 months starting in February (start of semester 2 in year 3) and ending in February of the following year (see Table 1). The placement period is expected to end in the December (i.e. usually lasting 10 ½ months). Note that in some cases delays due to funding, visas etc. can mean that the placement may start later than February. In such cases, the requirement is that the MPhys placement should be at least 30 weeks in length. Preparatory work can begin before the physical placement commences.

There are several milestones and deadlines in a typical placement and these are centered around visits made to you by an academic staff member of the Department (the *Visiting Tutor*), along with some assignments, culminating in an MPhys Dissertation. Section 2 of this handbook summarises the assessments which make up the modules comprising the Research Year. You will receive formative feedback from your visiting tutor, and from your employer, through the Research Supervisor.

Day-to-Day Life: The Research Experience

- During the Research Year you are still a member of the Physics Department. If you have worries about your placement you can contact your Visiting Tutor, Personal Tutor, the Research Year Administrator or any of the Research Year staff. It is always better if you can sort out any problems with your employers, but the Department is always available if you need help.

- Make sure that you are clear about who is planning your programme of work and that you know who to go to about everyday problems in the workplace.

- Keep a day-to-day record of your work in a **Research Notebook**. This can be an electronic record if you prefer. Your Visiting Tutor should ask to see this on each visit and will also be asked to comment on how well you are keeping this notebook. The purpose of this notebook is to act as a reference for yourself in report-writing and should also be considered as an important reference source for your employers. Any new material which you have to learn should be summarised in your **Research Notebook**.

- Be punctual and reliable. Treat the facilities at your disposal with respect.

- The Research Year is a unique experience. Make the most of it!

The 1st Visit Oral Presentation
It is an important part of research, and of working in a research team, that you are able to present your work to others. You will be communicating with other members in your group from day one. You are likely, depending on the circumstances of your placement, to have the opportunity to give short talks about your work to your team, or perhaps a wider audience. You are also likely to be able to listen to presentations from others and to ask them questions about their work.

As part of the Research Year, we expect you to participate fully in this kind of communication. In particular, you will be assessed on Oral Presentation skills as part of PHY3062. The content of this talk should be focussed on what hole in the existing literature you hope to fill, and how you will do it. It is not expected that by this stage you will have carried out significant original research and so you are not expected to present any. For example, you might give what is usually called a "journal club" talk about an important paper that sets the scene for your work. The mark scheme and other guidance is available on the PHY3062 SurreyLearn page and you should familiarize yourself with them, and discuss them with your RS/VT. The presentation will be scheduled at a mutually convenient time with you, your Research Supervisor and your Visiting Tutor, and this normally means during the first visit.

The Project Plan

In this activity you, the student, will carry out a study of your personal development and training needs for the year ahead. You will produce a project plan that describes the technical work you will be carrying out, identifying the main objectives of the Research Year, and you will discuss the key research techniques that will be used to carry out this work. You will lay out a project plan with the draft schedule for the year (with a diagrammatic version of the plan such as a Gantt chart). The plan should identify the main objectives, when they will be achieved, the steps needed to achieve them, and the potential roadblocks along the way. This Project Plan must be submitted to Surreylearn **in advance of the first VT visit** - See Table 2 for deadlines and Appendix 1 for more details.

The Literature Review / Interim Dissertation

As part of the structure of the Research Year, a major milestone is the production of a **Research Year Interim Dissertation** (also called "Literature Review" reflecting a major component of its contents and abbreviated as RYID).

This report is the major Unit of Assessment (UoA) in the 60–credit module PHY3062 (see Table 2 for deadlines). It is a written report that should be self-contained and demonstrates that you have made progress in understanding the physics background to your project, have learnt to contextualize your work within the broader research field, and that you are now able to communicate the key ideas *behind* your project. Its primary content should be a literature review, i.e. you should analyse the prior art in the area of your project and demonstrate a full understanding of what has gone before, in order to explain fully the context for what you expect to achieve. What it should *not* contain are results of your direct research, such as your own experimental data, or results of your own simulations – these are for the Dissertation and cannot be submitted twice for different modules.

Extensive guidance for your RYID is available in Appendix 2 and the Surreylearn page for the module.

We recommend that you have a discussion about the structure and content of the ID with your Research Supervisor and that you give them these guidelines and those on the Surreylearn module at an early stage.

The Dissertation

Your Research Year Dissertation (RYD) is submitted after the Christmas break the end of the Research Year (see Table 2 for deadlines). Since most placements will finish in December, you should aim to leave the placement with a good complete first draft of the dissertation. It is much easier to write the report during the actual research experience while it is fresh in your mind, and students often find that they need access to specialized computer packages or other special facilities in order to produce e.g. required diagrams.

The Dissertation is a report on a substantial amount of full–time research work usually done during the last months of the Research Year. Its form and content should reflect this.

The bulk of the content should be drawn from the *results* obtained throughout the whole of your research placement. In this sense it follows on from the RYID which contains the background contextualization and review of relevant literature. It is entirely possible (indeed likely) that you will continue to learn further relevant background material for your research work, which can be included in the dissertation write-up. You will probably also have obtained results in the earlier part of your Research Year which you will not have put in your Interim Dissertation but which will go in the Dissertation

One important piece of advice is to write bits up as you progress your work during the project, i.e. in your detailed laboratory diary. These can then be put together with analysis results during your last month of research when you would normally be producing a report for the Research Supervisor. This should then form the basis of your dissertation.

The Return to the Physics Department and the MPhys Symposium

Upon completion of your Research Year you return to the Physics Department for the Final Semester of your degree.

Just before the start of Semester 2, there is an **MPhys Symposium**. This is the showcase of the MPhys programme. You should have attended one during your second year, and current second year MPhys students should this session of presentations where MPhys students in their final semester who have just returned from their year of research will talk about their own placements. This is part of the professional activity of the research year, and is a chance to show your peers and the Department what you've been up to while you were away. Your presentation at the MPhys Symposium is assessed, and forms 20% of the overall module mark for PHYM051.

SECTION 5 INFORMATION FOR EMPLOYERS/RESEARCH SUPERVISORS

By the time one of our physics students comes to work for you they will have successfully completed the first two and a half years of one of our Masters in Physics Degree programmes. This means that, in many of the basic areas of physics, they have effectively completed their academic studies – they have enough academic credits to qualify for an Ordinary Bachelor's degree. The first semester of the third year of their degree programme is concerned with more advanced and specialised subjects. Students should also be well–versed in mathematical and computational techniques. They will have had two years' experience in using computer programming and performing experiments in our teaching laboratories. It is more appropriate, therefore, for you to consider the student as a "new graduate" rather than a "student", when considering the work they can undertake. For a complete listing of the modules that MPhys students take, you can consult the course catalogue available online at http://catalogue.surrey.ac.uk/. The placement student should be able to fill you in on any details and place the individual modules in context for you.

A copy of the Undergraduate Student Handbooks, for all years, is available from the Research Year Administrator upon request.

We expect students to be involved on a project of research that enables them to exercise and develop their individual talents and to put to good use their skills as physicists. In addition, it is important that the student is as fully involved as possible in the work of your organisation and should understand the relationship of their own work to the overall activity of the organisation.

The student remains enrolled at the University of Surrey while on placement, and the work they do for you will be assessed and credits awarded according to the University's modular structure. This means that we will be asking the student to complete assignments based essentially on the work that they will be doing on their placement, with some extra supporting work. Details of this can be found in Section 2 of this Handbook.

The Visiting Tutor (VT) for your Establishment

The University assigns a member of Faculty in the Surrey Physics Department, the *Visiting Tutor* (VT), who will be the main contact for you and for the student during the placement, although you can also contact the MPhys Coordinator if needed.

You, the RS, will be assigning work for the student as part of your own research programme and will necessarily have your own judgement of the student's work and performance – it is not the role of the VT to determine research objectives, methodology, or to provide day-to-day support. The student's work will also be assessed by the Visiting Tutor, in concert with you and other members of Surrey staff according to the University's double–marking procedures. The Visiting Tutor – an academic member of staff – will normally visit your establishment on two occasions (one time in-person and the second time may be remote/online, see details below) and a third meeting towards the end of the RY should take place between the tutor and the student to discuss the write-up. The Visiting Tutor should be involved in discussing details of the student's work

and will be chosen from among Physics Department staff to be normally as closely allied to the subject area of the placement as possible so that they may assess work critically and understand the project, although for operational reasons it may be that the VT is not from the same field of physics as the project. Problems which might arise concerning report material (e.g. confidentiality) and any changes in the student's work can usually be sorted out during these visits. Both of the credit-bearing assessments that you (the RS) will be involved with will be carried out with the VT, normally during the first of these visits (usually around Easter, and by the last Tuesday of June at the latest).

The Research Supervisor (RS) for your Establishment

We expect that an individual from your establishment - the *Research Supervisor* - will be responsible for the day to day supervision of the MPhys Research student. This person might be a group leader or person who is in charge of the area of work concerned and may have been involved in the final decision to employ the student. However, if, as sometimes occurs, the responsibility for day–to–day supervision is delegated to someone other than the group leader, then this person might be considered as the Research Supervisor. It is essential for us to be able to contact the particular individual who has the responsibility for the student's supervision.

The formal assessment of the student's performance in the two main reports, the Interim Dissertation and the main Dissertation submitted at the end of the placement (immediately after the start of New Year) is made by Surrey University staff members (often including the VT). Your input to the assessment process for the Interim Dissertation report is welcomed in the form of a commentary on the student dissertation, helping ascertain the context of the work, and the areas in which the student effort was particularly concentrated. You will be contacted by the student and/or the VT and/or the relevant module coordinator for such information at the appropriate time.

As well as the indirect input into the assessment of the two reports, you, the Research Supervisor, will be asked to contribute formally to the assessment of the early part of the placement with the Oral Presentation and the Project Plan that will normally take place during the VT's first visit (alongside the VT's assessment to provide two independent assessments). You should help the student to schedule this talk so that the presentations occurs in the normal environment for internal presentations in your group. The student will need help and advice on the oral presentation, and also later on the literature review (the "Interim Dissertation") and the Dissertation itself. After the students have completed the Research Year period and returned to the University, there is a fifth and final assessment in which they are each asked to give a short presentation on their work at the MPhys Symposium, attended by the whole Surrey Physics Department. You will be invited to attend the Symposium/presentation. The student should provide you with the guidance available to them in the Surrey University electronic learning environment (Surreylearn), but summaries of the five assessments with their deadlines are given in Section 4 above.

You, the RS, are expected to provide time and resources for the student to produce their **Interim Dissertation** and, near the end of the year, the first draft of a **Dissertation**. You should be careful not to provide so much support that the work is no longer that of the student. Please feel free to discuss this with the VT if you have questions or are

concerned. You should NOT provide corrections to the English of the report, and if the student uses you for this or any other detailed corrections they may be guilty of plagiarism/academic misconduct. Authorised support for English in dissertations (aimed at non-native English speakers) is available to students from the University Library.

The following general points are useful to bear in mind:

- Is the work you give appropriate to the particular student in terms of subject matter?
- Is the level of difficulty appropriate?
- Is the day-to-day supervision adequate so that the student is able to come to terms with the tasks that are required? Does the student understand the relevance of the work to the aims of the organisation?
- Is the student gaining new insights during the research period?

SECTION 6 INFORMATION FOR VISITING TUTORS

As the academic member of staff assigned to visit our students at their place of employment, your general responsibilities for their welfare and progress should be clear. Specific responsibilities are set out here, not in any order of priority.

In order to perform these duties, you are expected, in normal circumstances, to make two visits to the establishment concerned and to keep in regular contact with the student and Research Supervisor at other times. One of the visits must be in person and the second visit may be remote (online) unless the placement is local or nearby Guildford and easy to visit. A third meeting should take place between the tutor and the student, ideally in November, to discuss the progress in writing up the dissertation and give some general feedback on best practice. Tutors should avoid very specific feedback since they will likely be marking the dissertation.
If additional visits seem necessary, please discuss this with the MPhys Research Year Coordinator. To help you perform this job, a **checklist** of the important tasks for each visit is provided at the end of this section. Please refer to the appropriate checklist during each visit – it may be of help to you if you tick off each of the items in the checklists as you carry them out. It is wise to study the timetable of assessments in Table 2 carefully, particularly with respect to the deadlines and recommended times for each visit, and then decide beforehand roughly when the visits are to be made. Without planning well in advance, it can be difficult to see all the appropriate personnel and the student because of their prior commitments.

Duties of the Visiting Tutor (VT)

Each visit to the student is likely to require several hours, and it is very important that each visit is thorough, giving enough time for problems to be aired. Students should understand that they are members of the Physics Department and can contact us at any time, if necessary, between visits.

In the following, the term "Research Supervisor" means the **named** supervisor - that is, the group-leader or person who is in charge of the work concerned. Usually this person will have made the final decision to employ the student. However, in some cases the responsibility for day-to-day supervision may have been delegated to someone else and you should ensure that you talk to this person as well.

The student's performance during the placement is **assessed** through the assignments detailed in section 2, and in the corresponding SurreyLearn modules as well as the module catalogue. The Visiting Tutor should help the student be aware of the assessment structure within the Research Year. In particular the student, RS and VT should agree the time and duration of the assessed **Oral Presentation**, which should take place during your **first visit** (usually around Easter but no later than the deadline for the Oral Presentation - see Table 2). In advance of that first visit (at least one week before) the student should give you a **Project Plan** document, describing the project as they understand it, the timeline, and their training needs. This should be assessed, along with the Oral Presentation, at the first visit. In both of these assessments, you and the Research Supervisor are required to make a blind assessment (i.e. without conferring with each other), and then you, the VT are responsible for averaging the marks, discussing significant discrepancies (i.e. moderating), and then uploading both

of the final marks to Surreylearn, See Appendix 1 and 2 and Surreylearn for guidance given to students on both the Oral Presentation and Project Plan.

There are some tasks that you are asked to perform during **all** visits. These are:

- Have a discussion with the student and the supervisor (or delegate) about the present and future work and its assessment.

- Have a private discussion with the supervisor (or delegate) about the work the student is doing, how it is likely to progress and their opinion of the student's performance. This is essential in order to obtain an outside opinion of the student's strengths and weaknesses. Worries that the student might have should also be discussed. Ask about possibilities and recommendations for future placements.

Have a private discussion with the student about the placement during which you may choose to feed back information on the assessment so far of the student's achievements and offer advice over any problem areas. The VT should also question the student, in depth, about the basic physics (or other discipline) underlying the project(s) and its relevance and also make suggestions about aspects which need to be studied more thoroughly. The best approach is to arrange for the student to describe their work to you. Does the student really have an understanding of the terms used or is it only jargon? Many students are reluctant to voice any worries that they may have so an informal chat at the end of this discussion can be useful. Satisfy yourself that they have an identifiable project that is progressing satisfactorily, or else identify and pursue any problems.

- You should ensure that the student is keeping a record of their work in an acceptable form in a **Research Notebook**, hand-written or electronic, which you are asked to check.

- After each visit you should fill out a short Visit Report online form (a link will be emailed to you). **Travel expenses** for the visits will not be paid until the Visit Report Form has been completed and submitted. It is important to note that the Department has a separate budget to cover the costs of these visits; if the budget is overspent the Department has to cover this. General University rules for travel regulations apply for MPhys placement visits.

CHECKLISTS FOR THE VISITING TUTOR

First Visit Checklist

This should be made ideally in intra–semester break around Easter time (though this will depend on the situation, but it should occur **no later than the deadline for the Oral Presentation - see Table 2)**.

In advance of this visit you should:

- Make sure the student and RS are aware of the requirements for an Oral Presentation during the visit
- Make sure the student and the RS are aware of the requirements for the Project Plan, in particular that the student submits this at least one week before the visit.
    - Mark the Project Plan in advance so that feedback can be given to the student on the visit, and make sure that the RS knows they are expected to do the same.

During this first visit you should:

- Have a private discussion with the Research Supervisor during which you should:
    - Ensure that the Research Supervisor has received a copy of this handbook and is clear about its contents.
    - Ensure the Research Supervisor is aware of the student's need to submit an Interim Dissertation literature review and its deadline (Table 2 above)
    - Find out more about the nature of the work the student has been asked to do and form an opinion of its suitability and likelihood of continuity over the period of the placement.
    - Find out the quality of supervision.
    - Obtain the Supervisor's opinion of the student.
    - Average the marks for the Project Plan from you (the VT) and from the RS. If any of your marks differ by more than 10% have a moderation discussion to agree the marks, and upload the marks/feedback to Surreylearn.
- Have a private discussion with the student during which you should:
    - Obtain the student's comments on the type of work and supervision.
    - Check the student's **Research Notebook**
    - Check that the student has no worries about either their work or personal issues such as accommodation, settling in and salary. Explain that they can contact the Department at any time should they have any problems.
    - Ensure that the student has a copy of this handbook and has read and understood its contents.
    - Advise the student on the Interim Dissertation (see guidance on Surreylearn)
    - Ensure that the student understand the deadline for the Interim Dissertation (Table 2).
    - Discuss in detail the research work and probe the student's scientific understanding.

- Have a discussion with the student and supervisor together.
    - Discuss the Project Plan which forms 5% of the Interim Dissertation module (PHY3062)
    - Attend/assess the student presentation which forms 15% of the Interim Dissertation module (PHY3062). Exceptionally, this presentation can be organised to be given remotely (via Zoom/Teams/Skype or similar) at an alternative date. The Research Supervisor should also independently assess the presentation with the same form, and after the talk you average the marks, and you should have a moderation discussion where any marks differ by more than 10%. You should upload the moderated version of the assessment to Surreylearn. See the guidance for assessors in the Surreylearn module for more information.

- After the first visit you should fill out a short online Visit Report (link will be sent to you). This is vital for the RY director to monitor the cohort and out duty of care to our students to record the details of the visits.

Most students will initially require some day–to–day supervision. Depending on the confidence, level of understanding and degree of difficulty of the project(s), students should be encouraged to work with more independence as soon as possible. It is important that they know who to approach about technical problems and that this person is easily accessible. It is very important that students are not left floundering during the beginning of the placement. The VT should therefore ensure that there is enough of the right type of supervision and that students are clear about who is their supervisor. It is possible that, in a large establishment, the named supervisor is too busy to see students on a day-to-day basis in which case you should ensure that there is someone who can provide this type of supervision.

Second Visit Checklist

This should be made ideally around August–September. During this visit you should:

- Have a private discussion with the supervisor during which you should:
  - Discuss the work given to the student, how it is likely to progress and form an opinion of this.
  - Obtain the supervisor's opinion of the student.
  - Discuss the Interim Dissertation and any feedback the student may have had (likely to be available at the end of August)
  - Discuss plans for the student's **Research Project** and **Dissertation**.

- Have a private discussion with the student during which you should:
  - Obtain the student's comments. Any problems should be discussed and advice offered.
  - Check the student's **Research Notebook.**
  - Discuss in detail the work to be done during the **Research Project** and probe the student's scientific understanding.
  - Give the student feedback on the **Literature Review / Interim Report** (see guidance in surreylearn) as drafted, or as completed and marked (depending on the date of the visit).
  - Discuss a plan with a timeline for working towards the end stages of the Research Year including the timely completion of the **Dissertation**.

- Have a discussion with the student and supervisor together.

- After your second visit you should submit another online form Visit Report (link will be sent to you).

Final Meeting

A final meeting between the tutor and student should take place in November for discussing the progress in the writing of the dissertation and to give the student general feedback and guidance on scientific writing. This meeting will usually take place remotely (oneline) unless the student placement is local at the university or local to the area of Guildford. The visiting tutor has discretion to decide on this as appropriate.

SECTION 7 STUDENT PROGRESSION

During the last two years of an MPhys Pathway, students enter four *stages* of their programme within the meaning of the University Regulations on Progression: one 60-credit stage for each semester. Progression from one stage to the next requires successful completion of all the modules within it.

Results for PHY3062 are normally approved at the "Late Summer Assessment" (September) Board of Examiners. The dissertation module PHYM051 is dealt with at the February Board of Examiners following the end of the Research Year. The table below summarises this, dealing with what happens in the case of failed modules.

Table 3. Failure and recovery

1st attempt Failed	Resubmission/ extended deadline	2nd attempt passed	2nd attempt failed
Failed FHEQ level 6 module PHY3062 (RY Interim Dissertation, 60 credits) at LSA Exam Board. Pass mark FHEQ Level 6 = 40%	**Resubmission** of failed Units of Assessment: **Week 6 of the following Semester 1**	Submit PHYM051 Dissertation in Jan as normal. Marks for PHY3062 considered at Feb Exam Board and capped at the pass mark (40% for FHEQ6) Marks for PHYM051 considered at Feb Exam Board as normal	Failure considered at Feb Exam Board. **PHYM051 Dissertation disregarded.** **Cannot Progress (**to FHEQ level 7 semester 2). **Exit with BSc Ordinary** if >60 credits at FHEQ level 6.
Failed FHEQ level 7 module PHYM051 (RY Dissertation, 60 credits) at February Exam Board Pass mark FHEQ Level 7 = 50% **Programme suspended, cannot progress** (from Research Year stage to FHEQ level 7 semester 2) **pending reassessment**. Option to Exit with BSc Hons following 1st failed attempt.	**Resubmission** of failed Units of Assessment in **same period the following year** for February Exam Board.	Marks for PHYM051 capped at the pass mark (50% for FHEQ7) **Progress** from Research Year stage (to FHEQ level 7 semester 2).	2nd attempt failed considered Feb Exam Board following year. **Cannot Progress (**to FHEQ level 7 semester 2). **Exit with BSc Hons** if 120 credits at FHEQ level 6

SECTION 8 PLAGIARISM

Let us first make one thing clear: "plagiarism" is not simply an issue of formal academic misconduct (see the University Regulations for Academic Integrity). This is just the most serious kind. Plagiarism also comprises bad practice that demonstrates a lack of understanding, and of course, if you display a lack of understanding in your work you cannot be rewarded with marks that are as good as students that display good understanding. YOU WILL LOSE MARKS, and you may even face formal plagiarism proceedings, if you do not respect plagiarism conventions.

The first year course, Level 1 Scientific Investigation Skills explicitly addresses plagiarism and use of scientific literature, so it is expected that you already understand what constitutes plagiarism. However, many students often claim never to have undertaken any training in plagiarism. Your first action when you are trying to understand what is allowable should therefore be to go back and look at your old SIS notes. Here, to jog memories, is a very brief summary of two common failures of understanding: (a) what is acceptable paraphrasing of material from the literature and what is not; and (b) the utility of quoting material exactly and putting it in quotation marks. If it is found that you have done either of these things, you will lose marks on grounds that you will fail to convince the assessors that you understand the material.

(a) It is NOT acceptable to start by a copy and paste from a source, then to jiggle a few words around and use a few synonyms to avoid the text looking the same and being picked up by Turnitin. A Literature Review is not simply an encyclopaedic list of literature, it is first and foremost a ***review***, and you will not have performed any review if you simply regurgitate uncomprehendingly. To paraphrase in an acceptable way means to read the material that has the ideas, go away and think about it, understand what it means, and then without referring to the original text, write your own version of what was said in the reference. In this way you will convince the assessors that you understand the material you are discussing.

(b) To quote something in quotation marks is almost never useful in science. It is not preferable to (a) just because you make it clear that it is someone else's words by putting in the quotation marks, and that doesn't give you a "pass". It generally suggests that you know something is important but don't understand it well enough to describe it in your own words. Quotations are only sensible to use, usually, in a subject like philosophy, politics or poetry etc where the exact expression by the original author needs to be portrayed, because the idea will be discussed in detail, with reference to the original author's argument, or where the exact wording must be used, so as to accurately portray what you claim the original author said. Quotations are not appropriate when a concept or truth or idea of general applicability is described and being cited. In such a case, you should show that you understand it by using your own words. Otherwise, by quoting it, you are simply showing that you know it's relevant but you are not showing that you understand it. To gain good marks, it is necessary to show understanding, and you should paraphrase properly - see (a).

If you are a non-native English speaker you may struggle to put concepts into your own words. This is a challenge of course, and unfortunately you can lose marks for presentation if your English is poor, or worse, you can fail to express yourself so severely that the reader/assessor fails to understand you or you give the impression that you don't understand. In such circumstances you should still try to use your own

words, and seek help. You must NOT seek help with English from anyone other than an official University approved support service. If you are found to have used any help from peers, third parties, your RS, etc you may be guilty of academic misconduct. Please contact the English Language Support Programme (see MySurrey), the module coordinator, or the library (academic.skills@surrey.ac.uk). NB the English Language Support Programme offers generic help, and also help specifically for Dissertations but this service is not available the whole year so contact them early!

APPENDIX 1 THE 1ST VISIT PROJECT PLAN (PHY3062)

MARKS AND DEADLINES. See Tables 1 and 2 above. This coursework must be submitted to your VT and RS **at least one week before the 1st VT visit**, so that they can read and assess it in advance of the visit, and so they can discuss it with you during the visit.

This is probably the first time that you, the student, have one major objective for an entire year of work, and it is crucial to learn how to plan such a long piece of work so that you don't wake up one day and find that months have passed and you have been working purely on tangential activities that wont actually deliver what you need to attain your primary goal.

As part of this activity you will carry out a study of your personal development and training needs for the year ahead. You will produce a project plan that describes the technical work you will be carrying out, identifying the main objectives of the Research Year, and discussing the key research techniques that will be used to carry out this work. You will include a self-reflection on your scientific, technical and transferable skills training needs for the year. You should provide an honest assessment of what you already know how to do and what you don't, including what bits of necessary physics you think you already studied need to brush up on, and what you think will be completely new to you anyway. You should identify any specific personal or technical training or learning that you need to carry out.

The report must also contain a project plan and draft schedule for the year, including a Gantt chart. An important reason for this is so that if you have misunderstandings about where you are headed they can be corrected at an early stage. Of course it may be that the plan changes because of factors that are nothing to do with your (lack of) understanding. It is recognized that plans frequently change for perfectly good reasons, but that doesn't mean there should be no plan in the first place! You should have a plan so that when the plan changes you change it in full knowledge of the knock-on consequences, and the purpose of the plan (and the Gantt chart) is to make sure you are clear-headed both when you are deciding what to do on a day-to-day basis, and when you have a major fork in the road. You should therefore identify the critical tasks and less critical paths; the major decision points; and the key deliverables (achievements for yourself and others) and the nice-to-haves. A crucial part of the plan is to look for dependencies: what will happen if you fail to achieve task X by date Y? Will that mean that deliverable A should be changed to be B? or what happens if task X completes unexpectedly early? Will that mean that you can squeeze in C? What happens if your colleague is supposed to give you P samples and instead they only give you half of P, or they only manage Q instead?

It is hoped that you will keep this plan in plain view in your workplace as a reference, and that it will be a live document that you revise as necessary. The key thing is that it should tell you at a glance whether or not you are on track to achieve what you need to achieve, and reassure you that there is a Plan B if things go wrong.

You are strongly recommended to follow the steps listed below as you carry out this activity.

STEP 1: FIND OUT ABOUT YOUR RESEARCH OBJECTIVES FOR THE YEAR

As part of the initial planning for this activity you should arrange a meeting with your local supervisor to find out about the technical scope, aims and objectives of the year. Try to find out from your supervisor what they would ideally like you to achieve through the year ahead – this should naturally develop into a two-way discussion between yourself and your supervisor. Here are some example questions you may wish to discuss together:

- What are the main technical objectives of the research work?
- Is there a schedule for the year which maps against these objectives?
- What does success look like for this project? This is always a good question to ask at the start of any major piece of work. Discuss this together and try to identify concrete examples of output that will occur from the research year, eg. answering a particular scientific question, producing a journal paper, presenting your work at a conference, commissioning a particular experiment...
- What 'softer skills' would you (and your supervisor) like to develop during the year? Are there particular aspects of your work that you are nervous about that you can be supported by your supervisor?
- Are there any special circumstances in your project which will dictate your schedule, eg. Are you doing an experiment at an external facility. How can you mitigate against the risk of your schedule slipping?

You may quickly realise that it's difficult to fully map your research work for the year ahead at this early stage. That's very normal, and you may well spend several months at the beginning of the year doing smaller introductory pieces of work which often never end up in your final dissertation. However it's important to identify the main objectives and goals for the year, even if you're not sure yet how (or when) you are going to achieve them.

STEP 2: IDENTIFY ANY TRAINING NEEDS

As part of these discussions you should identify any training needs that you will have for the year ahead. Many organisations will require you to attend mandatory Health and Safety training and you should include this in your identified training needs. You may also wish to attend courses provided by your institution that develop softer skills such as how to give a presentation, or how to write a paper/dissertation.

Discuss with your supervisor if there are particular technical skills you need, or would benefit from. Examples could include learning to use specialist computer codes; going on training courses or spending time with a particular expert (e.g. another more senior student) in order to use particular laboratory equipment; or completing registration paperwork in order to attend an experiment at an external facility.

You should capture this information in your report, in the style of a self-reflection on your training needs for the year. This should also identify any specific personal or technical training as described above.

STEP 3: YOUR PROJECT PLAN

Write a detailed project plan for the year ahead, taking into account the information you have gathered from the previous steps. Your plan should combine some narrative text plus a diagrammatic chart such as a Gantt Chart. There is no required format for the layout of the Gantt chart, but it should show the schedule for the year broken down against the particular sections of work (or 'work packages'). You should also indicate

any particular objectives on the chart, eg. any particular outputs (or 'deliverables') that you wish to achieve such as going to a conference, or publishing a paper. Finally, the best Gantt charts have plan B activities, point to the major decision points, and indicate the dependencies (start G only when F has finished etc).

STEP 4: WRITE YOUR RESEARCH PLAN REPORT
Based on steps 1-3 above, write your research plan report, giving approximately equal weight to each of the 3 sections. The report should include the following (not necessarily with the following structure or order):

- A summary, of the technical objectives (i.e. what will be done)
- A motivation section (i.e. why the project is needed, and who cares/will care)
- A detailed description of the work plan that will be used to achieve the project's objectives (how it will be done). This could typically be divided into 'Work Package' sections describe smaller sections of the work that you plan to carry out at different stages through the year.
- A description of your personal and technical training needs, plus any other special circumstances which might affect your research planning (eg. attending an external facility).
- A Gantt chart that shows the schedule for the year.
- Describe any risks to your proposed research plan, eg. critical dates which might slip, and how you propose to mitigate these risks. A proper Risk Register identifies possible problems and assigns a likelihood of the problem occurring (Lo/Med/Hi) and the severity of the consequences for the project as a whole if it does occur (L/M/H). It would be normal to eliminate discussion of any "risks" where the answer is Low for both, because these are not really risks! Risk Registers are often presented in tabular form if they are more than just a couple of items.

LAYOUT GUIDELINES FOR YOUR REPORT:
Your report should be a professional presentation, as an electronic pdf file, with correct figure, section and page numbering etc. Your Project Plan report will normally be structured with the following sections:

- A 15 word title, your name and your affiliation,
- A brief Summary (say 120 words).
- Body sections such as Overall Aim and Objectives, Motivation, Workpackages, Deliverables, Training Needs, Risk Register etc
- A Gantt chart which may well take up a whole page.
- Bibliography (if relevant)

Although a Project Plan would normally have the above structure, this is just for guidance and you may want to vary it to best suit your project.

LENGTH LIMITS
It is recommended that you use the LaTeX AIP template described in Appendix 3 in order to become familiar with it. If you choose not to (or your host organization does not allow it), you should use the Word Template provided for the RYID. The only difference with formatting instructions for the Project Plan compared with those for the RYID given in Appendix 3 is that you do not need page breaks to separate the title page and bibliography from the main body of the document for the Project Plan. **The**

Project Plan should be no more than 5 pages in total, including all the contents, title/summary, chart(s), figures, and bibliography.

APPENDIX 2 THE 1ST VISIT ORAL PRESENTATION (PHY3062)

MARKING AND DEADLINES. See Tables 1 and 2 above.

SCHEDULING AND VENUE.
The OP will take place in front of your Research Supervisor (RS), the VT (both of whom must assess it) and local research colleagues/students in your group (as appropriate and agreed with your RS/VT). It will therefore normally take place during the first visit of your VT (normally around the Easter break), and if such a possibility exists, it should take place in the normal venue for your group's research discussions and presentations, which might be a weekly project meeting or wider student/intern talk meeting etc. in order to give you experience of speaking to the widest possible peer-group. If this is neither normal nor practical, then it could be presented to just the VT and RS and anyone else directly involved. It is in your interests to have an audience of interested and friendly peers that will take up the question time allocation - otherwise you face a grilling from the VT! You should ensure that the presentation is scheduled during the visit, a mutually convenient time by discussing it with your RS. If for some reason the OP cannot be given at this time, or the first visit cannot take place before the deadline, etc, it must be organised to be given via Zoom/Teams or similar at an alternative date.

CONTENT.
It is assumed that you will not have completed any significant original research by the time of the presentation. If you have performed original research by the time of the OP, you should still avoid including it for the reasons given in the overview (you need it for the dissertation at the end of your placement, and you can't be assessed twice on the same material in two different modules). Apart from this restriction, the content of the talk is quite flexible, because of the diverse nature of the different research placements. The main requirement is that you are interesting and authoritative and the content is informative and relevant, so the audience gets to understand some important aspect(s) of your project, in particular why you are doing it and what is already known. Therefore your OP could focus on what you have learnt about the project, the context, the background physics, plans, etc. You might choose to focus on a single important background publication (this style of talk is often called a “journal club” talk), in which case you should take care to explain how it is relevant to you and your work. If you are unsure about what kinds of things to talk about, please check the assessment form first, and then talk to your RS and/or VT. You can see from the form that the assessors will be looking for evidence that you have critically evaluated (some, not all!) prior art, and present a good reasoned argument about how your project builds on it and why it is interesting. See Surreylearn for tips on how to analyse a research publication and how to prepare an oral presentation.

The guidance in the previous paragraph is deliberately vague, in order to leave you with latitude. You are making the transition from a taught student to a research student, and you must therefore get used to the idea that there are no explicit instructions. In this sense the OP is like any live performance - there is far less enjoyment in something that has already been worked out according to the recipe of someone else and the performer is just filling in the blanks according to instructions. Just as there is no manual for how to create the perfect act for a stand-up or poet or bard, there is no recipe for the perfect scientific talk. However, this does not mean that I am washing my hands of the issue, and leaving you entirely to your own devices.

There is lots of guidance available on HOW to deliver what you want to deliver, for example see the other sections in this unit. In the end, nothing is more important than being interesting, authoritative, informative and relevant - so if the audience and the VT learn something about your research topic and come away with the impression that you really understand what you're talking about, then you've really done your job well. If, after reading this guidance you are still unsure about what to do in your oral, then discuss it with your supervisor and do a practice presentation!

Do's: do discuss the prior art and it's relevance; do describe your project's aims and how they build on the prior art. Dont's: don't include your actual research results (which should be saved for the Dissertation.

FIGURES AND PLAGIARISM
In a standard academic research oral presentation it is not formally acceptable to use figures copied and pasted from other documents, but it is very common in practice, and you will certainly be forgiven if you do it here. When it is done, a citation should appear next to the copied material to make sure that it is clear where the source was. In an ideal world, all figures should be original – see the guidance on how in principle things ought to be done professionally with figures in Appendix 3 on the RYID. To be clear, you will NOT be penalized for plagiarism if you copy and paste figures so long as the attribution is correct in any assessment for your Research Year (RYID/RYD included). Seek advice on attribution if you are unsure. HOWEVER, you will be penalized for bad presentation for figures if their presentation is bad! The threshold for unacceptable (unprofessional) figure presentation is much higher for the RYID/RYD than for the Oral Presentation, but you should still think about adding new axes or titles or blanking out irrelevant insets etc etc if this will make it easier for the OP audience to understand them.

ASSESSMENT.
The marking form is available on the PHY3062 SurreyLearn page and you should familiarize yourself with it before presenting. Please note that it is quite generic because the wide variety in placements produces a wide variety of talks. This vagueness is, above all, for YOUR benefit - you dont have to straight-jacket your talk into a narrowly defined idea of what the one-size-fits-all perfect talk should be. The diversity makes it hard to specify what the assessors are looking for in all cases, but they know it when they see it! The key thing is that you should be interesting, authoritative, informative and relevant.

FEEDBACK.
It is up to you to seek formative feedback on your OP by discussing it with your RS before the event, and it may also be possible to arrange a practice talk in front of either the RS or some other friendly members of your group before the assessed talk. You should NOT expect detailed commentary on the wording of the presentation, and the RS should not give it, but you CAN expect high level feedback on the content and structure. You can expect to receive the marksheet produced after the moderation discussion of the two independent assessments as summative feedback, within the normal assessment time-frame determined by the University Code of Practice for Assessments. By way of generic summative feedback, you can expect to be able to identify strengths and weaknesses in your work from the grade descriptor guidance on the marksheet. You can also expect to receive some specific summative feedback

identifying strengths and weaknesses in the form of a short report. Furthermore, this should be considered a kind of formative feedback for the RYID.

APPENDIX 3 THE RESEARCH YEAR INTERIM DISSERTATION (PHY3062)

MARKING AND DEADLINES. See Tables 1 and 2 above.

ASSESSMENT. You should submit a single pdf file, without your name on it (so that it can be marked anonymously). The RYID will be marked anonymously and independently by two members of academic staff, and only in exceptional circumstances will the assessor(s) be an expert in the specific topic of your report, and it is even quite unlikely either of them will be active in the general field. This means that if, say, your report is in the field of nuclear theory it must still be comprehensible to an optics experimentalist, whom you must convince that you understand the material. You should therefore aim the report to be read by someone who is a professional physicist (or another MPhys student) but not an expert in your own project.

Please consult the marking Forms on SurreyLearn for detailed criteria against which it will be marked. Just as for the Oral Presentation the forms are somewhat generic, and this is, above all, for YOUR benefit, so that your report does not have to be forces into the one-size-fits-all ideal of a perfect literature review. At this point in your fledgling research careers, you must now come to realise that there is no ideal way to perform research and there is no ideal way to present it either. Your main objectives should be to be informative, interesting and authoritative, and convey an idea to the assessors that you understand the topic of your research placement, and you know as much as anybody else about what has gone before.

GENERAL GUIDANCE. Please see the general aims and objectives of the module for the overall idea of what's wanted, and of course you should familiarize yourself with the assessment rubric which explains the weightings (presentation 2 : literature review 2 : project description 1). Please also consult the other guidance pages in Surreylearn, and pay particular attention to the guidance on length and content and structure. For guidance on how to assess a journal article for a literature review, please see the note in the Oral Presentation unit, and go here for guidance on the introduction. You are also strongly advised to use Overleaf Latex as described in the style guide, for the reasons laid out in it. You are also strongly advised to download and use a reference managing tool such as Mendeley, which is available free to download (including via Surreysoftware), or any equivalent which is available in your host institution. Such software helps you to keep track of every paper you find, and your notes about them. There are many on-line guides about how to use such packages.

FEEDBACK. It is up to you to seek formative feedback on drafts of your RYID from your Research Supervisor, and they will be asked to assist you. You should NOT expect detailed commentary on the wording of the RYID and the RS will be asked not to give it, but you CAN expect "high-level" feedback on the content and structure. You can expect to receive the marksheet produced after the moderation discussion of the two independent assessments as summative feedback, within the normal assessment time-frame determined by the University Code of Practice for Assessments. By way of generic summative feedback, you can expect to be able to identify strengths and weaknesses in your work from the grade descriptor guidance on the marksheet. You can also expect to receive some specific summative feedback identifying strengths and

weaknesses, and this might be either in the form of a report, or an annotated copy of your RYID, as deemed appropriate by the assessors.

Your Research Supervisor will be asked for information about the level of help, guidance and feedback that was available, in order that the assessors have some baseline with which to reward initiative and understanding. You will be able to access this information after the assessment. Note that Assessors will be instructed to assume significant guidance was given, and the statement from the RS will only be used to reward student initiative, not to penalize the lack of it.

FORMATTING REQUIREMENTS (FONTS, MARGINS, COLUMNS AND PAGE SIZES) and LENGTH LIMITS

The following instructions apply to all students, including those who choose to use the templates mentioned below. In other words, you must obey these, page size, margin, and font size instructions below, irrespective of any templates, so that all students have the same amount of practical space in which to express themselves.

- The font chosen should be the default one for AIP templates in LaTeX, or for other editors 10 point Times or Times New Roman font.
- The line spacing should be single spaced.
- The column set-up for the main document should be 2 columns 7.6cm wide and 0.6cm gap.
- Please produce your report with A4 page size, and with left and top margins of 13mm and bottom and right margins of 39mm (0.5" and 1.5"). The total margins will therefore be a regular 2" but with a decent sized space at the right and bottom for assessors to write comments and feedback.
- **The title should be 15 words or less.**
- The column set-up for the title page and abstract should be single column, and the width of the abstract should be 13cm wide. **Abstracts must be 150-300 words. This translates to about 10-20 lines of the specified width**.
- **THE LENGTH LIMIT FOR THE BODY IS 14 (FOURTEEN) PAGES*** with the font/line/page set-up specified above. This limit on the length of the body of your report includes the body text, all figures, figure captions, and equations. It excludes the title page and references. There is no limit for the reference list.
- In order that the length of the body of your report is clear, it should start on a new page, i.e. there should be a separate title page (which includes the title, your URN, your affiliation, and the abstract). You should also add a page-break before the References section.

Remember that the length limit is not a target: if you can produce an exciting, readable, logical RYID in half the space, so much the better, but assessors will need convincing that you have committed 80% of 60 credits-worth of effort to craft it.

* Specifying the length limit precisely for a physics report that has references and equations and figures is a little difficult. The starting point for the specification is that the body of a report of this level and credit that is entirely text should be 12,000 words according to University practice. Pasting 12,000 words of Lorem Ipsum into the body of the recommended LaTeX AIP template in Overleaf, and using half a dozen section titles (which take up extra white space) makes the body somewhat under 14 pages. Clearly, equations and figures convey information in an efficient way and there is no reason why they should not count to the space limit. In this report we do not want to discourage or limit any use of references so these do not count towards the limit.

Obviously you must not try to circumvent the length limit by reducing the font size, the paragraph line spacing, the margins etc. If you do it will be obvious to the assessors when they see several reports side-by-side.

LATEX TEMPLATES AND REFERENCE MANAGERS

It is recommended that you use LaTeX and the American Institute of Physics (AIP) journal template (in Overleaf.com search AIP template). There are lots of advantages for a practicing scientist to use LaTeX rather than MS Word, Apple Pages, etc, especially for technical work, and once you start you won't go back! LaTeX provides much better control over equation appearance, and much easier inclusion of automatic ordered numbered equations and reference lists. LaTeX is free with many apps, and there is a free cloud based version at Overleaf.com. If you keep your references organized in a reference manager like Mendeley (available free through Surrey), you can automatically create your numbered reference list.

The required font, line-spacing and column set-up is the default for the AIP LaTeX template in "reprint" mode (a convenient option when you are sending a draft to your RS or VT for comment is to switch to the "preprint" option in the documentclass statement at the top, which makes the line spacing larger so they can write comments between the lines). To achieve the correct page size and margins, please insert the following LaTeX commands in the appropriate places:

```
\usepackage{geometry}
\geometry{a4paper, total={158mm,245mm}, left=13mm, top=13mm }
```

To add a page break after the abstract in LaTeX using the AIP template, try

```
\hfill \clearpage \newpage
```

It is recognised that some organizations do not allow either LaTeX or cloud-based solutions, and an MS Word template file, that looks very closely similar to the LaTeX output from the AIP template is available on Surreylearn, with the correct fonts, line spacings, columns, etc. If you use a different word processor (neither Word nor LaTeX), then as before make sure you use the correct settings for fonts, margins, column widths etc just mentioned.

CONTENT.

The main purpose of the RYID document is as a literature review of the state-of-the-art in the field in which you will work, and a description of what your project will be. As mentioned elsewhere, you should avoid including your original research results (if you have any by the RYID submission deadline) since you cannot be assessed on these twice. Your report should be self-contained and demonstrate that you have made progress in understanding the physics background to your project, have learnt to contextualize your work within the broader research field, and that you are now able to communicate the key ideas behind your project. You should explain as much background literature as is relevant to your work. Obviously your Research Supervisor should be your first point of call for relevant literature to get you started, but you should expect to search the literature yourself. See guidance on Surreylearn for literature reviews and how to assess a journal article.

Your report should contain high quality original figures and diagrams where possible. See the guidance in Surreylearn on figures for more details. If you occasionally use copy and pasted figures from the web (with credit to the creator) the assessors will not

mind, so long as they are high quality and readable. All figures and tables must have a caption that explains what the reader is supposed to get from them (e.g. explaining the axes of any graphs, saying what the main features that can be seen in the data, etc). All figures and tables must be mentioned in the text (with words like “as shown in Fig. 3a” etc).

Appendices (often called "supplementary materials" these days) have a very specific purpose in the scientific literature. They are there to help specialised readers reproduce your results by giving details that would be distracting for the general reader, or to contain lists of high precision numerical data to back up figures. **You should assume that the assessors of your RYID are like the general reader, i.e. they will not read the appendices or supplementary material. However, they will count to your length limit.** Therefore, you should avoid appendices in general, and it is expected that the only reason to use appendices in the RYID would be if you have space left over and you found some details that will be of significant benefit to the next generation of students in your host group (who might be given your RYID as a starting point). It is bad practice to put the same information in both a figure and a table - if you think tables of numbers will be crucial for such future students then consider putting them in an appendix.

Theory used must be explained. You do not have to repeat full derivations from textbooks or the journal literature, but if there is an important equation that will help the reader (i.e. including the assessors) to understand the relationship between important variables you are discussing, then it is crucial that you should explain all the symbols, and the general starting points that were used to derive it, such as any approximations that were made that make it valid in your case or invalid in others. It is also often helpful/necessary to explain how each of the terms in the equation can be found from experiment or other theories.

ORGANISATION AND LAYOUT. The report should be formatted in sections. A typical layout and contents of the Interim Dissertation would be as follows. You are allowed, and even encouraged, to deviate from this, but bear in mind the marking rubric - it is easier for the assessors to fill in the marks if the report organization separates the literature review from the project)

- A title page with an abstract. The title should obey the word limit above, and accurately reflect the content of the RYID document (the title should not say what the project was "supposed to be", and it should be specific, not be generic and all-encompassing etc). The abstract should describe what is in the main report and the main finding(s). **For anonymous marking reasons, the version you submit should state your URN in place of your name, and you should give your organisation as ‘Department of Physics, University of Surrey, Guildford GU2 7XH, UK’, not your host institution.** Obviously, your RS may ask you for a copy with your name on and your host institution address for their records. This aspect will be assessed under the "Presentation and Style" part of the rubric.
- An introduction section. This must be accessible to a non-specialist that is not working in your field, because your assessors will almost certainly not be specialists. This aspect will be assessed under the "Literature Review" aspect of the marking rubric. See Surreylearn for more guidance on this section.
- The Literature Review. One or more body sections should explain what is in the literature for the various aspects of your work. This is the main part of your

review, and you need to demonstrate that you have analysed the literature, not just copy/pasted the abstracts. The best literature reviews "synthesize", i.e. they put many works into a unified picture, and combine material from each source into a coherent argument. They distinguish the facts from the interpretation, and they criticize the literature and do not simply take every word of every work as the canonical truth. Remember that to the authors of a paper, it is their "baby", and parents often oversell the qualities of their children unintentionally. See the example annotated review in Surreylearn, along with other guidance. Note that if you simply describe what is in the literature, then you will likely get lower marks than if you show evidence that you can critically assess it.

- The Research Project. You should have a section describing your specific research project. This should outline the “hole” in the literature, what you will do, and how far your expected results will go towards filling the hole. This section could also be divided to sub-sections which describe various relevant aspects of the methodology. You should also discuss the disadvantages of your methodology, and any alternative approaches to the problem you are working on, with their pros and cons. This should be quantitative as possible, i.e. using formulas, mathematical derivations, graphs etc. You should be sure not to give an uncritical suggestion that your project will be the perfect answer to everything in the field, or worse, that your project will fix the wider grand challenge in which your research area sits. **This section is likely to overlap with, and build upon, your Project Plan, and you should take advantage of feedback you have received. The assessors will not include your VT and will not have seen your previous plan, and such overlaps will NOT be considered plagiarism.**
- A short concluding section which should draw out key points in summary. The difference between this summary paragraph and the abstract can be quite difficult to understand. Essentially, a good scientific work (either a Literature Review or regular research publication) should pose a research question (to use the example above, "can we learn something about ERBB2 protein expression that could be targeted in a therapy?", or in the case of a Review an example might be "what is already known about ERBB2 protein expression or other similar proteins and the relevance to therapies?") and then give the data (or the literature). The summary paragraph summarises the answer to the question - essentially either yes, no, or maybe (with some details, obviously). The abstract on the other hand, has to explain in brief the whole report, i.e. the question, the type of data, and the answer.
- Although a report would generally end with acknowledgements to state the source of any funding and academic support you have received, this is discouraged for anonymous marking reasons. It might be appropriate to do this anonymously, e.g. "I would like to thank my research supervisor, without whom I would not have been able to do YYY, and the group of colleagues who helped me understand the intricacies of XXX"
- A reference list. See the separate section on referencing for detailed guidance on this section. This will be assessed under the Literature Review aspect of the rubric.

CITATION STYLE

There is no mandated citation style for the references in your RYID. If you are using the AIP template just use the default style. Possible alternative styles are:

"This has been shown to be a negligible effect for the type of experiments we are considering here [14]".
Or possibly the superscript style "... considering here[14]".
Some prefer the author and year style "... considering here [Murdin 2013]"

AIP uses the middle one (superscript). The last one is not very common in physics literature, but the advantage for the reader is that you can more easily recognise a citation that comes up many times without having to go to the bibliography to check every time, and the advantage for you is that you don't have to keep the bibliography in numerical order, but the down-side is that it will take more space and count to your length limit. It is your choice, but if you are not using the AIP template I recommend the first version "[14]" because it is easier to read.

BIBLIOGRAPHY STYLE
There is no mandated citation style for the references in your RYID. If you are using the AIP template just use the default style. There are also many many different styles for writing the bibliography. Obviously the item has to start with the number or name/year that was used in the text in numerical or alphabetic order. Apart from this, it is really up to you. The most common variations are: Authors can be "Initials Surname" vs "Surname, Initials", the title of the work may or may not be included, the DOI number (see above) of the work may or may not be included, and in cases of many authors the list may be truncated to "F. Author et al." or possibly "F. Author, S. Author, T. Author et al." I recommend the following style:

> [14] B.N. Murdin, et al. "Si:P as a laboratory analogue for hydrogen on high magnetic field white dwarf stars", Nat. Commun. 4, 1469 (2013). DOI: 10.1038/ncomms2466
>
> Note the DOI number at the end. This code makes it super easy for someone else to find the publication - you just type the DOI with www.dx.doi/ in the address bar of your browser and it takes you straight there.
>
> Note that the scientific journal literature is "permanent", and there is no need to insert any information like "date of access" in your bibliography items.
>
> The rules for AIP journals are: author list truncation is discouraged, but allowed when there are four or more (or ten or more depending on the journal) and you would otherwise go over a length limit, and titles are optional, unless they would push you over a length limit. [NB in this report there is no length limit on the references, so you can keep all author names and article titles without penalty if you wish]. DOI numbers are not used, but the journal reference part (in the example above, "Nat. Commun. 4, 1469 (2013)") is hyperlinked. It is your choice.

QUALITY OF REFERENCES. The assessors of your RYID will be expecting that you mainly refer to publications in the regular refereed scientific press. These works are "permanent" and cannot be changed at a later date, so although they forever retain their flaws, you can be sure that everyone is always referring to the same thing. Web references should only be used if you are trying to explain a scientific article by using a figure that you took from the author's web page, etc. If your list of references has a

significant fraction of web references it will be considered by the assessors that you have not really looked at the scientific literature.

NUMBER OF REFERENCES. There is no set target or minimum number of references expected, since this varies from topic to topic, and it may be that an interesting and valuable RYID can be produced with a handful of very well chosen and very well analysed papers. Note also that there is no maximum, and references do not count to your length limit for this report. You are strongly advised to discuss your progress frequently, and the papers you have found, with your RS (and/or VT).

FIGURES AND TABLES, AND PLAGIARISM
Figures and tables should have a meaningful caption, that explains to the reader what they are supposed to see from the figure. Do not assume that the reader will see immediately (and take away) the key information that you see, so unless the figure is a really simple cartoon you will probably have to give some explanation. Also, your axis labels on graphs will usually be quite concise, so you might want to use a few more words to explain what the axes mean or how the measurement was made, etc. As a general rule, the more information in the caption the less the reader needs to search within the text for explanation, which is helpful.

Although the caption should make it relatively self-contained, every figure (and table) should be cited in the text at some point, so the reader knows when they are supposed to distract themselves from reading. In LaTeX it is easy to use the \label{figname} and \ ref{figname} construction so that the figure numbers can be cited and will always be correct even when you insert a new figure in the beginning of your report.

The importance/desirability of original figures in a literature review is common a source of confusion for students, and there is extensive guidance on Surreylearn. In general you should try to make your own figure, even if you have to digitize data from the figure. This is what professional researchers have to do, because of copyright rules that make it much harder to simply "cut-and-paste". Even when you remake your own original figure based on one you saw elsewhere, it must come with a citation like "**After Ref [14]**", If you do end up copying and pasting, the caption should say "**Taken from Ref [14] without permission**" assuming that you don't have written permission from the original creator, or possibly "**Taken from Ref [14] with permission**" in the unlikely case that you do, or that it has an explicit Creative Commons License for re-use (like CC-BY etc). **Incorrectly cited sources for figures may be considered plagiarism, so seek advice if you are unsure.**

FEEDBACK. It is up to you to seek formative feedback on your RYID by discussing it with your RS before the submission. You should NOT expect detailed commentary on the wording, and the RS should not give it, but you CAN expect high level feedback on the content and structure. You can expect to receive the marksheet produced after the moderation discussion of the two independent assessments as summative feedback, within the normal assessment time-frame determined by the University Code of Practice for Assessments. By way of generic summative feedback, you can expect to be able to identify strengths and weaknesses in your work from the grade descriptor guidance on the marksheet. You can also expect to receive some specific, written summative feedback identifying strengths and weaknesses in the form of a short report or comments on the report. Furthermore, this should be considered a kind of formative feedback for the RYD.

RELATIONSHIP BETWEEN THE INTERIM DISSERTATION AND THE DISSERTATION. The Interim Dissertation here (PHY3062 - RYID) and the Dissertation (PHYM051 - RYD), are obviously overlapping. See Appendix 4 for how to refer to the RYID in the RYD.

APPENDIX 4 THE RESEARCH YEAR DISSERTATION (PHYM051)

The general layout should be as for a Masters or PhD thesis. Please note that the structure is not prescriptive, and you do not have to use a set template provided by the university. The designing of the most appropriate structure is part of your task, but we do recommend a general outline, given below. There are many available generic dissertation templates to download from the internet and you can use either Word or Latex (the final file should be submitted as PDF). The University Regulations for taught programmes contains a section on "Format of dissertations". Students should ensure that they follow the instructions contained therein. At the time of writing, the URL for the University's regulation documents is https://www.surrey.ac.uk/quality-enhancement-standards/regulations.

The regulations state:

> **143** Each dissertation is submitted with a title page that bears
>
> - the dissertation's approved title
> - the student's full name
> - the degree for which the student is registered
> - the year in which the dissertation is presented
> - a statement in a form approved by the University that the dissertation is the work of the author and that the work of others is indicated by explicit references
> - statement in a form approved by the University that asserts the student's right to be identified as the author of the work and the copyright owner.
>
> For each dissertation a 300 word summary of the dissertation in English must follow the title page.

The rest of the dissertation would typically involve further sections of preamble, such as

Acknowledgements
List of Abbreviations
Contents

These would then be followed by the main body of the thesis, organized into chapters. The chapter headings are up to the student, and will depend on the nature of the research project. A *typical* layout for a dissertation might be:

Chapter 1 **Introduction/background**

The structure of the introductory sections is up to you to design. However, for completeness, we ask that material brought in from RYID will written in a dedicated section called 'Precis of RYID & Reflection', which is described here:

Précis of RYID & reflection

Your RYID should already contain much material that introduces your project and its context. This does not need to be fully

repeated in the dissertation, but a synopsis (up to 5 pages, typically) of the project, which can be drawn from your RYID, should be presented so that the main body of the dissertation is self-contained.

The original RYID should be presented in an Appendix and you can refer to it here. You may also reflect on, and build on, the RYID, particularly if the project has been altered since the RYID, or there is new relevant literature that you wish to discuss.

Chapter 2 **Experimental / Research Methodology**
Chapter 3 **Experiments Performed / Calculations or Models Made**
Chapter 4 **Results and Analysis**
Chapter 5 **Conclusions and Outlook for further work**
Appendix A Your Previous RYID
Other Appendices (Programs, setting up procedure, device schematics, subsidiary plots and results, etc.)
Bibliography As for the RYID you should follow a suitable bibliographic style which is suitable for your sub-field of physics, as agreed with your placement supervisor. If it is up to you to choose, the Physical Review style is recommended, as linked to above in the RYID section.

The total of the material in chapters (i.e. excluding appendices, contents and title pages etc) should be no more than 100 pages when double-spaced (or fewer when single-spaced). This page limit should not be considered as a goal. The nature of your research data and its natural form of presentation will have an influence on the actual number of pages in your dissertation. You may use any software to write your dissertation that you choose, though we strongly recommend using software that is compatible with the University systems such that IT help is available – particularly as students are usually based in the UK for the period between Christmas and submission. In the past, most students have used either Microsoft Word or LaTeX; both are suitable for producing the dissertation. An electronic copy of the final dissertation (in either Microsoft Word or portable document format (.pdf)) should be submitted via SurreyLearn by the advertised deadline. Paper copies are not required. The University regulations permit the University to keep copies of dissertations with a mark of 70% or greater in the Library, and to make such copies available. Examples of such dissertations will be available to you on SurreyLearn. Access to dissertations with confidential contents can be restricted through the process outlined in the Regulations for taught programmes.

APPENDIX 5 MPhys SYMPOSIUM ORAL PRESENTATION (PHYM051)

The MPhys symposium is our annual event where we celebrate your research year achievements. The date is typically Friday of week 15 and we run it physically on campus (TBC). We typically hold a few sessions in parallel just so that we manage to get through all the presentations in one day. You are both presenters and audience, with academics, supervisors and other students joining in. Especially, the next year's cohort will be interested to hear about your research and they are invited. The presentations are typically 15 min long and then a few minutes are dedicated for Q&A. Typically 10-15 slides work well: motivation for the work and the challenge, some background slides on the problem, what was your approach and methods, what were your results and conclusions (a few slides each of these sections). Practise the presentation with yourself or a friend. That is really key! I cannot overstate the importance of having these practice runs. You will also be marked on the presentations by staff members (two markers for each presentation). The assessment rubric is available under this module 'course materials' section. Every project is of course different and presentations in Astro would look a bit different compared to Nuclear, but the guidelines above are quite universal. Keep in mind that you are speaking to a general audience of physicists, who might be unfamiliar with your specific area of expertise. Any questions please email the RY Director. During semester 1, I will provide you with information about how we are going to run this day and technical/logistical detail. Our programme administrator will also contact you during January to collect the titles of your projects and provide you with the final schedule and logistical details a few days before.