

PHY480

Research Project in Physics & Astronomy



The
University
Of
Sheffield.

A Guide to Semester 1

Fourth Year Web Site

Students should all consult the 4th year web site to find out dates and deadlines relating to the 4th year project. This written guide is designed to be distributed unaltered each year, so indications of deadlines, meeting places and times given here should be taken ONLY as a guide, and not as the final word. Check the 4th year web site for the final word! This web site is at:

<http://www.shef.ac.uk/physics/teaching-resources/fourth-year>

Selection of a Project

Students should turn in the attached project choices form by the deadline given on the fourth year web site. This will usually be the last Friday of week 1 of teaching in the autumn semester, but please check the web site to make sure. It is imperative that you discuss the projects which interest you with their supervisors before submitting the selection form. You are required to obtain signatures for the supervisors of the projects you list. You will be allocated a project from this list if possible. We will respect the ordering of your choices subject to limitations on student numbers. Should all your choices be over-subscribed, you may be contacted and asked to submit further choices.

Students should work in pairs unless it is agreed with the year tutor and project supervisor that exceptional circumstances exist. Both students in any pairing must have agreed to work together. Even in the case of students working in pairs, all submitted work should be submitted individually, ie, two posters, one per student.

Aims During the 1st Semester

During semester 1 of your PHY480 work you should:

- Develop an understanding of the relevant background science using relevant research literature if appropriate.
- Develop understanding of the experimental, computational, or theoretical techniques relevant to the project.
- Implement preliminary and preparatory experiments, calculations, or computer software as appropriate.
- Develop a realistic plan of the project, including resources you will need, the time you anticipate needing for different aspects, and the aims of the research.
- Maintain a log-book recording your progress on the project.

Time Allocation

Approximately seven hours per week.

Logbooks

It is considered good practice to maintain a logbook of research work. This year, on the recommendation of the external examiner, students will be required to keep a paper record of the research work on their project. A lecture on good practice for keeping logbooks will be provided as part of PHY480. The logbook will be turned in with the final

report for the project at the end of semester 2. Quality of research notes in the logbook will be assessed as 15% of the final grade. See the pie chart at the foot of this note for a full breakdown of PHY480 assessment.

A Guide to keeping log books.

Research work consists of a series of investigations, often building one upon the other towards some goal or key result. A log book is like a journal of your research work suitable for fellow researchers to read. You should use it to document the investigations that you do, with a good structure for documentation being 'aim, method, results, conclusion'. Plots, figures and drawings can be taped or pasted in. You should write the date on every new day you write in the log book. It should be legible.

A good rule is never to remove pages or plots, even when the work turned out to be wrong or lead to a dead end. Errors should be crossed out with a single line, and a brief explanation of why they were crossed out if this is helpful. A log book is a good place to record incidental information useful to your research - details of how to use equipment, contact information for people with whom you are working or who you might want to speak to, lists of items you need to obtain or make, locations of files or programs on the computer you are using, etc. If you keep a good log book, it will be a useful asset to you in doing your research, and it will certainly assist you when you come to compose your poster and report. Finally, your log book will allow you to see if you are managing the project well, doing sufficient work each week to build towards the final goal of the project. Think of log book keeping as a learning outcome of the project; if you go on to do further work in science research learning to keep a good log book is essential.

A Guide to Working in a Pair

Consider working effectively in a pair as one of the beneficial learning outcomes of a project. You must try and get the right balance between individual progress on the project and supporting each other in learning the material more effectively. Is one of you better at programming than the other? This is common. In this situation, it is good when the more experienced computer programmer helps the less experienced partner get up the programming curve more quickly. It is also not surprising when the more experienced programmer is given more programming-oriented tasks as part of the project, whilst the less experienced programmer is encouraged to focus on other less programming related tasks. It is not so good when the less experienced programmer ends up watching the more experienced one do all the work. In short, try to achieve a balance between improving your own knowledge and making individual breakthroughs, and achieving progress through teamwork. If you feel that you are not being given the opportunity to perform effectively as part of your partnership, talk first with your research supervisor, and then to me if you feel that your concerns are not being addressed. Lastly, do remember that the final assessment is done on each of you individually, so your posters and written output should make it clear what you have contributed to the project as an individual.

Supervisor Contact

A meeting should take place at least once a week to discuss progress. Every fortnight, your faculty supervisor should inspect, sign and date your logbook to acknowledge that he/she is informed of your progress on the project. This is true even if your usual contact in relation to your project is somebody other than your faculty supervisor.

Assessment

The 1st semester assessment will be based on a poster presentation preceding the Christmas break. The traditional poster session is on the Wednesday of week 12 - the last week of teaching before the Christmas break. Numbers on the M.Phys. course have in-

creased significantly, and we now have well over 30 students on PHY480, and this is far too many posters to accommodate at once in the media room, we will have to come to an alternative arrangement. Very likely we will split the poster session between two days, the Wednesday and Thursday or week 12. Please check your email and the 4th year web site for announcements. Although details have still to be ironed out, the assessment will follow roughly the same pattern as last year. Each student individually will be asked to present a poster, which should be their own work and not a joint production between the pair. That is, separate posters reflecting the individual work of the two students in each pair should be produced. Each student individually will be approached by members of the assessment panel, one at a time, who will discuss their poster and project progress with them. The assessment panel will meet separately in closed session to discuss marks for this portion of the project. One possibility being considered is that

Assessment Panel

E. Daw, S. Cartwright, D. Whittaker, J. Cockburn, P. Crowther.

Poster Submission

An electronic copy of your poster should be submitted using TURNITIN by the date specified on the Y4 web page, usually the last Friday in the penultimate (second last) week of teaching before the Christmas break.

Plagiarism

The report must be entirely the student's own work. Students may face an allegation of plagiarism if work

- has been written or dictated wholly or partly by another person;
- has been wholly or partly copied from the work of another person, with or without that person's knowledge or consent;
- contains quotations from the work of others which are not acknowledged; or
- consists wholly or largely of the work of others even if the sources are acknowledged.

Penalties for plagiarism depend on the seriousness of the offense, but range from the docking of marks to the awarding of a zero grade. Offenses may also be recorded internally in university records for future reference.

A Guide to Poster Contents

The poster should provide a readable, well presented, concise account of your research activities consistent with the aims outlined above.

1. **Outline of background and motives.** Outline the science background to the research you are doing. What is the importance of the specific measurements you will make as a part of this field?
2. **Research plan.** What are the aims of the research? What resources will you need, and what is your plan to obtain any that you don't already have? How long do you anticipate the various steps in your plan to take?
3. **Presentation of preliminary studies.** All projects will involve some preliminary studies of an experimental, theoretical, or computational nature. These studies and any results obtained during the first semester should be presented on the poster. Conclusions of these studies and their anticipated consequences for the remainder of the project should be stated.
4. **References and credits.** Your poster should make it clear what is your original work and what was gleaned from the work of others. It is courteous to acknowledge the assistance of postdocs or other staff in enabling your research.

Poster Format and Style

A poster should be striking, concise, and clear. Avoid the style of a magazine article or a scientific paper where long paragraphs of text are encouraged; this will result in a poster that is tiring and annoying to read. Even those who only glance at the poster

should still be able to come away with as much useful information as possible. Some practical points are:

- **Format.** The poster should be A0 size. Landscape format is advised since posters in portrait format tend to be hard to pin up at a height where all information is readily viewable. Most students use powerpoint to generate their poster, but other software can be used too; for example OpenOffice can be used as an alternative on linux-based machines, and keynote on macs - in fact any software that can generate a poster sized output in pdf format is acceptable. The important consideration is the content of the poster.
- **Heading.** Think hard about a heading that will capture the interest of your audience. It does not have to be the same as the title of your project! Be imaginative.
- **Use of colour.** Be careful to choose colours for foreground and background that have high contrast. Remember - colour mapping from your computer monitor to printed output will not be perfect, so err on the side of caution by avoiding colour combinations having poor contrast like green on yellow, black on blue, etc.
- **Use of diagrams and plots.** Often a diagram is far clearer than a paragraph of text. Plots of data are the mainstay of any results presentation, and you should think carefully about what plots to use. Make sure the axis labels are legible and sufficiently large, and that their meaning is clear. Figures, plots, and tables should have numbered captions explaining exactly what they represent.
- **Navigation.** The reader should find it easy to follow your poster, and the layout should take them through the information you are trying to get across in a natural and transparent way.

Examples

It is worth looking at posters that are displayed around the department. Find some you like, and ask yourself why they appeal to you. Find others you don't like and ask yourself what went wrong. It is also a good idea to show your poster to your supervisor far enough in advance of the assessment for them to give constructive feedback. They are likely to have had plenty of experience and to be able to offer useful advice. And they may also spot mistakes!

Production of hard copies of your posters

After submission of your electronic copy on the date given on the 4th year web page, you should take a CDROM or memory stick of your poster to the architecture department printing office. The architecture department printing office is in room 17.8 of the arts tower. The hours of this office are 8am - 12:30pm, 1:30pm - 4pm. From this copy, the office will produce a large format printout. I strongly advise that you visit the office twice, once to turn in your copy, and once later that day to check that the printing worked. You will be allowed to correct formatting and compatibility problems up until 16:00 on that day.

Poster Session

I will arrange for collection of posters from the architecture print office in preparation for the poster session. The date, time and location of the poster session are given on the fourth year web site. The poster session will usually be held in week 12 of teaching, the week immediately preceding the Christmas break.

Questions

If you have questions, comments, or complaints about any aspect of PHY480, feel free to approach me in confidence: E. Daw, D28, Hicks, X2-4353, e.daw@shef.ac.uk. Alternatively, complaints can be addressed to D. Mowbray, head of the teaching committee, or through the staff/student committee.

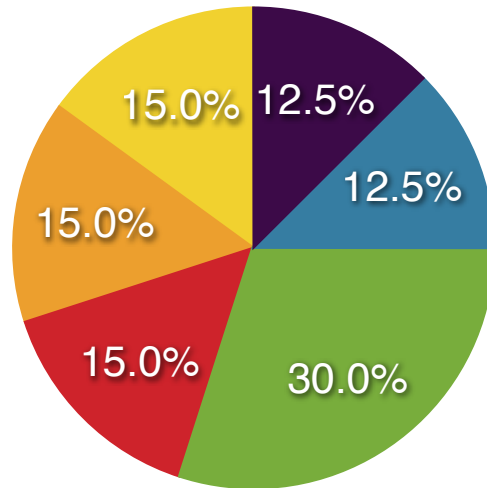
PHY480 on the web

All of the information above is available on the web at

<http://www.shef.ac.uk/physics/teaching-resources/fourth-year>

Assessment Breakdown for PHY480

- Poster content
- Poster oral discussion
- Written report content
- Viva
- Supervisor assessment
- Log book



PHY480 Project Selection Form

Before projects are allocated it is essential to obtain the prospective supervisor's signature to confirm that you have discussed the project with them.

Please indicate your preference on this form and return it to the Physics department office by the date specified on the 4th year web site.

(Note: If no choice is registered projects will be allocated randomly.)

Name:

Partner's name:

Course: MPhys(SH), MPhys(DH), MPhys(CP), MPhys(TP)

Other Subject: (if Dual Hons)

(If no choice is made partners will be allocated randomly)

ORDER OF PREFERENCE:

(Please use the numbers allocated and, to avoid confusion, a short title.)

CHOICE	PROJECT NUMBER	NAME	SUPERVISOR SIGNATURE
1st			
2nd			
3rd			

N.B. All projects offered by individual supervisors cannot always be allocated concurrently.

Edward Daw,
D28