

Doing a Physics second-semester TSP project: how it works

In both Junior (first year) and Intermediate (second year) Physics we offer a wide selection of mini projects to students in the Talented Student Program. These projects are carried out in the July (second) semester in place of around half the regular laboratory program; more details are given below. In contrast to experiments and projects carried out in the regular labs, the TSP projects involve working with researchers in one of the School's research groups. For most students this will be your first direct contact with how real research is carried out. In this research apprenticeship role, you will often have access to highly sophisticated instruments and facilities that you'd normally meet only if you went on to honours or postgraduate study.

In Physics we extend this privilege to high-achieving students who narrowly missed out on being selected into TSP but who are passionate about Physics and intend to major in it. The additional criterion we impose is that you should score at least a Distinction in the first semester Physics Advanced exam, to show us that you're coping well with the coursework. Projects inevitably involve spending extra time researching the literature and learning new experimental or data reduction techniques, and we don't want this to adversely affect your coursework marks.

Choosing a project

Because of the diversity of topics, students usually find this the most difficult part. The best way is to contact potential supervisors and ask for more information about the project or projects that interest you.

Timing

As soon as you've decided which project you want to do, make contact with the project supervisor(s) (and a possible partner) and arrange meeting times. It's a good idea to make a start on your project by week 2 of the semester. To begin with you'll probably need to do quite a lot of reading to get up to speed with the new material you'll encounter. Expect to spend around 3 hours/week on the project, spread over the whole semester.

You should aim to finish data collection/analysis no later than the end of week 10. The oral presentations will be in week 12, with carry over into week 13. Reports are due at the end of week 13. To celebrate the conclusion of the project and the semester, we usually put on a free lunch for students and supervisors in week 13.

How much standard lab work do I do?

For **first year students** doing PHYS1902 you spend 5 sessions in the Carslaw Labs doing the 5 circuits experiments. Your last lab session is in week 6.

For **second year students** doing PHYS2913 you spend 6 sessions in the Second Year Lab working at your own pace. Many groups find they can complete 3 experiments in that time. Your last lab session is in week 7.

For **second year students** doing PHYS2912 *only*, it *may* be possible to substitute the TSP project for the computational physics portion of the quantum physics module, but you must first get written permission from the Intermediate Physics coordinator, Assoc Prof Mike Wheatland.

Assessment

Your TSP project work is assessed in three ways: participation (20 marks), 10-minute oral presentation (10 marks), and a 2000–2500 word written report (20 marks). These marks replace the corresponding lab marks. Even if you're working in a pair (or a group of three) each student must give a talk and write an individual report.

The *participation* mark is awarded by your supervisor based on your application/keenness/drive in carrying out the project. Your *talk* is assessed by members of staff, based on clarity, scientific content, and your ability to answer questions from the audience. Your *report* is assessed by your supervisor(s) and double marked by us to ensure uniformity. It is worth noting that the prizes for experimental physics frequently go to TSP project students.

Reports

First year students: For this activity we ask you to write your report in the style of an article for a popular science magazine like *New Scientist* or *Scientific American*. Apart from giving you freedom to show your creativity, it also forces you to communicate the results of your project in language that is more accessible to a general reader. However, this should not be taken as an excuse to dumb down the science. If you need to include equations or explain a procedure in some detail, enclose this portion in a labelled box and refer to it in the main text. All figures should be numbered, contain an informative caption, and be referred to by number in the text. Don't forget to include a full bibliography or reference list at the end of your report. It's also a good idea to include an acknowledgement to your supervisor(s) since he/she/they will be marking your report! Sample reports from previous years are linked from the TSP web pages.

Second year students: We expect second years to write a more formal report in preparation for the kind of reports you will be expected to produce in senior physics. All of the requirements listed above still apply, except that equations and procedure are now part of the text.