



The  
University  
Of  
Sheffield.

**Department of Physics and Astronomy**

**Handbook for Postgraduate Students  
2005/06**

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Welcome to the Department of Physics and Astronomy. We hope that you find your time here as a PhD student enjoyable, rewarding and stimulating.

This handbook is intended to explain most of the academic and administrative details associated with your PhD programme. It should be read in conjunction with *Code of Practice and Guidebook 2005/06*, *The Research Training Programme Handbook 2005/06*, the department's *Safety Handbook* and *Staff Handbook*.

## 1 General Information

### 1.1 Registration and Induction: Important Dates

- 27<sup>th</sup> September** *RTP Information Session for new Research Students*  
9.30 Octagon Centre
- 27<sup>th</sup> September** *On-Line Registration Event*  
Firth Hall, Firth Court  
Surnames A to G: 13.30 - 14.15  
Surnames H to O: 14.15- 15.00  
Surnames P to Z: 15.00 – 15.45
- 30<sup>th</sup> September** *RTP Registration Event*  
Firth Hall, Firth Court  
Surnames A-L: 10.30 – 11.15  
Surnames M-Z: 11.15 – 12.00
- 5<sup>th</sup> October** *Welcome Meeting*  
An introduction to the department and RTP modules, given by Dr William Barford, Postgraduate Tutor.  
15.00, Media Room (E39), Department of Physics and Astronomy
- 5<sup>th</sup> October** *'Meet and Greet' Party*  
16.00, Austin Room (D32), Department of Physics and Astronomy
- 16<sup>th</sup> November** *Health and Safety Meeting*, given by Alan Bateman.  
11.00, Media Room (E39), Department of Physics and Astronomy  
**ALL STUDENTS MUST ATTEND THIS SESSION**

### 1.2 Key People

- Head of Department: Professor Clive Tadhunter (E35)
- Postgraduate tutor: Dr William Barford (E24)
- Tutor for Integrated PhDs: Dr Tim Searle (E49)
- Departmental Manager: Mrs Catherine Annabel (E29)
- Laboratory Superintendent: Mr Alan Bateman (E24a)
- Departmental Secretary: Mrs Linda Simmons (E34)
- Postgraduate Secretary: Mrs Julie Milner (E34)
- Postgraduate Secretary (DTC): Mrs Kealey Lambert (E34)
- Health and Safety Officer: Dr Neil Cowlam (E37)
- Postgraduate Representatives: See the postgraduate web site

A full list of members of staff (with their research interests), clerical and technical staff, postdoctoral research assistants, and research students is available at:  
<http://www.shef.ac.uk/physics/contacts>

### 1.3 People to Contact if you have Problems or Queries

- **Financial Matters**
  - Petty cash
  - Cash advances and insurance
  - Conference registration
  - Car Hire
  - Demonstrating Forms
  - First point of contact:** *Joanne Coates (Departmental Office)*
  
  - Expense Claim Forms
  - Purchase Orders
  - First point of contact:** *Rebecca Raynor (Departmental Office)*
  
- **General Postgraduate Matters**
  - Registration
  - Research Training Programme
  - Studentships
  - Research Council Forms
  - Graduate Research Office
  - First point of contact:** *Kealey Lambert (Departmental Office)*
  
  - Inter-Library Loan Vouchers
  - Photocopy Cards
  - Mentor Sessions
  - First point of contact:** *Julie Milner (Departmental Office)*
  
- **General Technical Matters**
  - Infrastructure (office, labs, etc.)
  - Security
  - First point of contact:** *Alan Bateman (E24a)*
  
  - I.T. Support
  - Web manager
  - First point of contact:** *Richard Webb (E30a)*
  
- **Research Topic**
  - Progress or understanding of research topic
  - First point of contact:** *Your supervisor*
  
- **Grievances**
  - First point of contact:** *Your supervisor, mentor or the postgraduate tutor, as appropriate (see section 3.4)*

## 1.4 Health and Safety

Please refer to the departmental *Safety Handbook*.

- Health and Safety Lecture: Mr Alan Bateman (11 a.m.16th November, E39)
- Out of Hours Training: Contact Mr Chris Vickers (C10),  
or wait for e.mail notification

## 1.5 Student Timetable

The timetable shown below is a summary of dates of key activities in your PhD programme. The items should in bold are necessary activities for student progression (see section 2). (These are also components of some RTP modules (see section 4).) Mentor sessions and quarterly questionnaires are described in section 3.

Time (months)	Activity
0	Registration: “register to read”, register RTP modules, etc. Induction: meet with supervisor, postgraduate meeting, meet and greet social event, safety meetings, etc. Mentor session
3	Quarterly questionnaire
6	Quarterly questionnaire Mentor session
≤ 6	Literature review essay (PHY6030/50/70)
9	Quarterly questionnaire
≤ 9	Presentation of literature review to research group (PHY6030)
12	Quarterly questionnaire Mentor session
≤ 12	<b>First year report and viva</b> (PHY6010/50)
15	Quarterly questionnaire <i>Upgrade from MPhil to PhD</i>
18	Quarterly questionnaire Mentor session
21	Quarterly questionnaire
24	Quarterly questionnaire Mentor session
≤ 24	<b>Second year report and thesis plan</b> (PHY6010) Presentation of research topic to research group (PHY6010)
27	Quarterly questionnaire <b>Presentation at the departmental research day</b> (PHY6010)
30	Quarterly questionnaire Mentor session
33	Quarterly questionnaire
36	<i>Submit thesis</i>

## 1.6 Postgraduate Committee

The postgraduate committee consists of:

Dr William Barford	(postgraduate tutor)
Dr Chris Booth	(particle physics representative)
Dr Paul Crowther	(astronomy representative)
Mr Chris Duffy	(student representative)
Dr Jamie Hobbs	(condensed matter physics representative)

Mrs Julie Milner  
Dr Luke Wilson

(postgraduate secretary)  
(recruitment)

### **1.7 Student Representatives**

Postgraduate student representatives play an important role in organising social events (see section 1.10), representing student views on the postgraduate committee, and helping to organise the departmental research day (see section 2.3). A full list of these representatives is available on the postgraduate web site at,  
<http://www.shef.ac.uk/physics/research/postgraduate/index.html>

Volunteers are always welcome. (Please see the postgraduate tutor, if you are interested.)

### **1.8 Reporting Illness**

If you are unable to come into the department due to illness, please make sure that you telephone Mrs Julie Milner (direct line 222 3514) to let her know. She will then inform your supervisor and any other relevant people in your research group.

### **1.9 Departmental Colloquia and Seminars**

As well as the Monday lunchtime seminars, which form part of the RTP module PHY6010 (see section 4.2), and the specialised research seminars that your supervisor will require you to attend, the department also organises general research colloquia, held on Tuesday and Wednesday afternoons. (The Tuesday colloquia are organised under the auspices of the IoP.)

*You are strongly encouraged to attend as many of these colloquia as possible, as a good attendance helps to maintain a stimulating research atmosphere in the department.*

### **1.10 Demonstrating and UCAS Activities**

Research students often participate in demonstrating to undergraduates (in laboratory and problem class sessions), as well as in UCAS day activities. If you would like to help in these paid activities, please see the departmental office.

### **1.11 Social Activities**

These are organised by the student representatives (see section 1.6), and usually include a welcome party early in semester 1, plus walks, meals and cinema trips. Please see the student representatives for more details.

### **1.12 Other Information**

Please refer to the postgraduate web site at:

<http://www.shef.ac.uk/physics/research/postgraduate>

and the postgraduate notice board (near to E28) for the latest news and announcements. Also refer to the Graduate Research Office web site.

## **2. Assessment and Progression**

### **2.1 First Year Report and Viva**

First year reports are regarded by the department as an essential component of the first year of your PhD programme. The report and viva will be used as an assessment for upgrading from MPhil status to PhD status (see section 2.4). Successful completion of a satisfactory report is also an essential component of modules PHY6010 and PHY6050 of the University Research Training Programme (see section 4).

The report, which should be a minimum of ten typed pages in length, plus any diagrams, should contain a summary of your work so far, and a brief description of likely future directions in the next year.

The report should be submitted to the postgraduate secretary by the end of September of your first year. You will then be assessed by a *viva voce* with your supervisor and another member of staff, who will provide a written report on your progress.

## **2.2 Second Year Report and Thesis Plan**

As for first year reports, second year reports and thesis plans are regarded by the department as an essential component of the second year of your PhD programme. Successful completion of a satisfactory report is also an essential component of module PHY6010 of the University Research Training Programme (see section 4).

The report should contain a *brief summary* of your second year work, a list of published or submitted papers, an outline plan of your thesis, and a timetable for the successful completion of your PhD. It should be submitted to the postgraduate secretary by the end of September of your second year.

## **2.3 Presentation at the Departmental Research Day**

In your final year you will be expected to present your research via a short presentation (~20 minutes) at the departmental research day (scheduled sometime in January). A panel of academic staff and research students will judge these presentations, with the best three being awarded prizes. (Please note that this presentation also forms an integral part of module PHY6010 of the Research Training Programme (see section 4.2).)

## **2.4 Upgrading from MPhil to PhD**

Upgrading from MPhil to PhD status usually occurs early in the second year of a PhD programme. This is determined by satisfactory performance in the previous 15 months, judged, for example by successful completion of the first year report, a satisfactory viva and the completion of at least 20 RTP credits.

# **3. Supervision, Monitoring and Grievance Procedures**

## **3.1 Supervisory Meetings**

Meetings between your supervisor and yourself should occur frequently and informally.

However, it is a university requirement (see the *Code of Practice and Guidebook*) that a formal record is kept of some (but not all) supervisor-student meetings. Thus, every 6-8 weeks a formal meeting should take place between you and your supervisor(s). This meeting should include a review of the previous period and a plan of work for the next period.

Following the meeting it is your responsibility to make a written record of this meeting. A convenient way to do this is via the on-line form at:

<http://www.shef.ac.uk/pgresearch/uosonly/suprec.html>,

*which should then be forwarded by e.mail to your supervisor(s) and the postgraduate research secretary at [j.milner@shef.ac.uk](mailto:j.milner@shef.ac.uk).*

*You should keep a copy of this report in your records.*

Although apparently onerous, you will find that regular recorded meetings of this kind provide a useful structure and guidance to your PhD work.

### **3.2 Mentor Sessions**

At the beginning of your first year you will be assigned a member of staff outside your research group as a mentor. Mentor sessions occur every 6 months and typically take up to 30 minutes. These will be scheduled for you by the postgraduate secretary.

*We do attach great importance to these sessions, so please be sure to attend the meeting organised for you.*

*What is mentoring for?*

The aim of the mentoring session is you should be given the opportunity to discuss the progress of your research project, the quality of supervision, and the adequacy of your research environment with a member of academic staff who is outside your research group. You are encouraged to raise any worries that you might have and discuss what action, if any, needs to be taken to address them. Your mentor will ensure that you are progressing as expected, and that you have a clear idea of where your research is going. Reports from mentoring sessions will provide documentary evidence of your progress, identify any problems, and highlight areas where action needs to be taken.

*What should the outcome of a mentoring session be?*

At the end of the mentoring session, your mentor should be satisfied:

1. That you meet regularly with your supervisor(s) and that you are satisfied with the outcome of these meetings.
2. If more than one supervisor is involved, that you are receiving coherent supervision.
3. That you have a clear idea of what you are doing and where it is going, and that you have made adequate progress since the last session.
4. That you are happy that you have the facilities necessary to undertake the work.
5. That you are submitting papers to journals and/or presenting original material at conferences.

### **3.3 Quarterly Monitoring Questionnaire**

In addition to the mentor system, each quarter you are also requested to fill in a one-page questionnaire about the progress of your research, and the quality of the supervision and research environment. The aim of this questionnaire is not to replace the mentor system, but to complement it by providing a means of identifying problems as quickly as possible so that they may be rapidly tackled. The questionnaires will be treated confidentially and reviewed by the graduate tutor. If you raise an issue, then in the first instance the graduate tutor will discuss it with you to determine the appropriate course of action.

*We do attach great importance to these questionnaires, so please take a few minutes to complete them.*

### **3.4 Grievance Procedures**

Hopefully, you will find your experience as a PhD student in Sheffield an enjoyable, satisfying and stimulating experience. However, it is possible that circumstances occur that are not satisfactory, for example, problems with your research environment (e.g. office or laboratory space), problems with equipment or your supervision, etc. In the first instance, if appropriate,

you should raise these issues with your supervisor. If this is not appropriate, or if the issue is not resolved, you should then raise it with your mentor or the graduate tutor.

## 4. Departmental RTP Modules

This section contains brief details of departmental organised Research Training Programme (RTP) modules. It is expected that most students will select at least one module from the generic modules, PHY6010, PHY6030, PHY6050 and PHY6070. There are also more specialised taught modules for astronomy, condensed matter and particle physics (see below). Please also refer to *The Research Training Programme Handbook 2005/06* and the Graduate Research Office web site for details of other modules.

### 4.1 Training Needs Analysis (TNA)

Before choosing your RTP modules you should discuss with your supervisor your training requirements. Since the RTP extends over three years, this analysis should occur at the start of every academic year. A TNA form is available at:

<http://www.shef.ac.uk/content/1/c6/04/57/57/TNA%20form.doc>

### 4.2 PHY6010 - Professional and Research Skills for Physicists and Astronomers

Aims/Descriptions: There are three interlinked objectives to this module:

1. To provide research training tailored to the student's research project.
2. To provide practice and feedback on scientific presentation and communication skills.
3. To expose students to a wider professional research environment.

These objectives will be accomplished by the student:

1. Receiving subject specific training by their research groups
2. Preparing first and second year reports.
3. Presenting a 20-minute talk at the departmental research day.
4. Regularly attending group meetings.
5. Regularly attending departmental seminars and colloquia.
6. Making other presentations to research groups, etc. as appropriate.

Time (months)	Activity
1 - 12	Attend twelve Monday lunch-time seminars
9 - 24	Presentation of research topic to the student's research group
12	First year report and viva
24	Second year report and thesis plan
27	Presentation of research at the departmental research day

The schedule for Monday lunchtime seminars (organised by Dr Mark Fox) is posted on the postgraduate web page and notice board.

Credit rating: A = 5, B = 5, C = 5

Teaching methods: Seminars, tutorials, laboratory sessions

Assessment: Project/dissertation, talks, coursework

Level of study: First, second and third year of research

Staff contact Dr William Barford

### 4.3 PHY6030 - Literature Survey in Condensed Matter Physics

Aims/Description: To formalise the literature review for condensed matter physics PhD students in a way that will both enhance their presentational skills and provide a focus for their background reading. The course will consist of the following:

1. Literature search and review: starting from a list provided by the supervisor, the student will make a survey of key references in the literature.
2. Essay: the student will be expected to write a 3,000 word essay, based on the literature survey, which will consist of a critical review of the subject area of the PhD.
3. Talk: the student will also present a 20-minute talk on the subject of the essay to the research group. The essay and talk will be assessed by two members of staff. Feedback will be given to the students on their performance in the essay and talk.

Time (months)	Activity
6	Completion of literature survey and directed reading essay
9	Presentation of literature survey to research group

Credit rating: B = 5, C = 5

Teaching methods: Seminars, tutorials

Assessment: Project/dissertation, talk to research group

Level of study: First year of research

Staff contact Dr Jamie Hobbs

### 4.4 PHY6040 - Experimental and Theoretical Foundations of Particle Physics

Aims/Descriptions: To provide, through 120 lectures with tutorial support, the theoretical and practical skills required to conduct research in high-energy particle physics or particle astrophysics. Theoretical topics include quantum electrodynamics and Feynman diagrams, electroweak theory and quantum chromodynamics.

These subjects are assessed through sets of problems for each topic. Experimental techniques are introduced in courses on particle detectors and relevant computing skills, again with exercises provided for the students. Part of this course draws on training material provided by external bodies such as the Cockcroft Institute. 84 hours of core in-house lectures are provided; the remaining 36 hours (minimum) are selected by students in consultation with their supervisor from 194 hours of optional material.

Students are also expected to attend HEP seminars and take part in the PPARC RAL Particle Physics Summer School at the end of their first year.

Credit rating: A = 5, C = 10

Teaching methods: Lectures, tutorials

Assessment: Problems

Level of study: First year of research

Staff contact: Dr Chris Booth

#### **4.5 PHY6050 - Research Skills for Particle Physics**

Aims/Description: To develop the practical skills required for independent research in particle physics or particle astrophysics.

Each student conducts a literature survey on some topic of current research, being guided in the use of research journals and other publications. A computer or hardware project is also assigned, with students developing a substantial analysis or simulation program, or building a detector or associated electronics (as appropriate to their personal research field). Assessment is on the basis of a written report and a 15-minute presentation to the particle physics group.

Students are also required to produce a poster summarising their research work (e.g. for the IoP HEP Conference or RAL Summer School) and write a first year report, which is examined in a viva by the supervisor and an independent member of the group.

Credit rating: A = 10, B = 5

Teaching methods: Seminars, tutorials, laboratory sessions

Assessment: Project/dissertation, talks

Level of study: First year of research

Staff contact: Dr Chris Booth

#### **4.6 PHY6060 - Astronomical Background for Graduate Students**

Aims/Description: Graduate students in astronomy usually come from backgrounds in physics and mathematics. As a consequence they generally lack a background of essential astronomical knowledge. In order to remedy this situation we propose to require all astronomy PhD students to take relevant courses from our undergraduate astronomy MPhys courses. The choice of courses will be matched to the PhD subjects of individual students. We envisage that each student will take 28 lectures (one 18 lecture course and one 10 lecture course). The assessment will be by oral examination involving two members of staff.

Credit rating: A = 10, C = 5

Teaching methods: lectures

Assessment: Oral examination

Level of study: First year of research

Staff Contact: Dr Paul Crowther

#### **4.7 PHY6070 - Astronomical Literature Review**

Aims/Description: To formalise the literature review for astronomy PhD students in a way that will both enhance their presentational skills and provide a focus for their background reading. The course will consist of the following:

- (1) Literature search and review - starting from a list provided by the supervisor, the student will make a survey of key references in the literature
- (2) Essay - the student will be expected to write a 3,000 word essay, based on the literature survey, which will consist of a critical review of the subject area of the PhD. The essay will be assessed by two members of staff in an oral examination.

Credit rating: B = 5, C = 5

Assessment: Essay/oral examination

Level of study: First year of research

Staff contact: Dr Paul Crowther

#### **4.8 Other Departmental Modules**

- PHY6002 Inorganic Semiconductor Nanostructures
- PHY6006 Macromolecules at Interfaces and Structured Organic Films
- PHY6007 Molecular electronics and Photonics
- PHY6021 Advanced Quantum Mechanics

#### **4.9 Other (non-departmental) Recommended Modules**

- CIC6001-4 Introduction to High Performance and Grid Computing
- GSC6000 Information Management
- GSC6100 Library and Information Skills for Successful Research
- GSC6110 White Rose Interpersonal Skills School
- GSC6120 UK GRAD programme
- LAW666 Law for Scientists
- PMA6020 Learning LaTeX

Overseas students have found the following useful:

- GSC6050 Thesis Writing: Principles and Practice
- GSC6060 Speaking Skills for Research Purposes