



OXFORD UNIVERSITY

COMPUTING LABORATORY

Graduate Research Student **HANDBOOK**

2008

Research in the Computing Laboratory

The Computing Laboratory—the University's Computer Science department—is at the heart of computing and related interdisciplinary activity at Oxford. It is a centre for research in computer science, numerical analysis, computational biology, quantum computation, computational linguistics, and information systems. It is also a place where students obtain an outstanding education in computer science through a variety of undergraduate and graduate programmes, including a part-time, professional programme in software engineering.

Our central aim is to be among the world's leading Computer Science departments. The Laboratory's research strength derives from its firm grounding in core Computer Science disciplines, a relatively high degree of mathematical sophistication among its researchers, and its committed engagement with applications and interdisciplinary work. Over the past several years we have significantly broadened the spectrum of computing research in the Laboratory, and we plan to reinforce this in future, always conscious of the need to do work which is both relevant and of a high intellectual quality. More information on the research in the Laboratory can be found at:

<http://web.comlab.ox.ac.uk/research/>

Training research students is integral to what we do; it is perhaps the most vital contribution we make to the future of our subject. The training combines individual supervision with a selection of lecture courses, transferable skills training and opportunities to participate in leading-edge research activities. We recruit students from Oxford's high-quality undergraduate and Masters' degrees, as well as nationally and internationally. Admissions into graduate programmes in the Laboratory have sharply increased in the last few years, reaching well over 100 D.Phil. students today.

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Welcome

Welcome to Oxford University Computing Laboratory.

You have chosen to study at one of the world's leading centres for the development, application and teaching of computer science. You join an expanding group of researchers, lecturers, visitors and students who have been attracted to Oxford from all over the world. The Laboratory's reputation ranges from its fundamental research into computing methods and languages through to practical solution of engineering and scientific problems on the latest highly parallel computer architectures. Our wide-ranging collaborative work with leading industries in this country has been twice recognised by the rare honour of a Queen's Award for Technological Achievement.

During your study at Oxford, we hope to share with you some of the excitement we have about the topics we investigate, and of the understanding we have gained, both by our research into basic theory and by industrial collaboration. The development of computing at Oxford has been heavily supported by research grant funding from the government, EU and science foundations, as well as donations and sponsorship from our industrial partners. We are committed to offering our research students the best supervision and to providing a stimulating research environment.

This handbook aims to save time by giving you a certain amount of basic information which you would otherwise have to ask for or learn by experience, but it cannot tell you all you need to know. Do not be afraid to ask for further information or advice.

Christine O'Connor
Academic Administrator

Marta Kwiatkowska
Director of Graduate Studies

1 Sources of information

This handbook is designed as a guide for graduate research students in the Computing Laboratory. It does not replace the official regulations relating to your degree, which you will find in the *Examination Regulations*, but it is a less formal and more easily understood guide to being a research student in the Computing Laboratory. It also contains general information about the Department, people, facilities and safety.

There is an edition of this handbook on the Computing Laboratory's website at:

<http://web.comlab.ox.ac.uk/teaching/dphil/>

In addition to this handbook there are some important sources of information that you should make sure you are familiar with.

1.1 The Grey Book

The *Examination Regulations*, usually known for obvious reasons as the “Grey Book”, is the authoritative document on the regulations for the University degrees and examinations. You should receive a free copy of the relevant part of this book through your College at the beginning of your first term. The *Grey Book* defines the rules for admission to and progression through the programmes of study and the syllabus for examinations. The regulations are available online at:

<http://www.admin.ox.ac.uk/examregs/contents.shtml>.

1.2 The Proctors' and Assessors Memorandum

The University has two Proctors, the **Senior Proctor** and **Junior Proctor**, who are responsible for making sure that the University operates according to its statutes. As well as being members of key decision-making committees, they deal with

- university (as distinct from college) student discipline
- complaints about university matters
- the running of University examinations

They also carry out ceremonial duties, e.g. at degree ceremonies. The **Assessor** is the third senior officer, responsible particularly for student welfare and finance.

The Proctors' and Assessors Memorandum is the document relating to the rules and the statutes of the University which you are expected to follow. This can be found at:

<http://www.admin.ox.ac.uk/proctors/info/pam/index.shtml>

1.3 Statements of Provision for Research Students

These detail the provisions that have been made for you by the University and the Colleges. The statement that is applicable to you is written by the Computing Laboratory; this can be found at:

<http://web.comlab.ox.ac.uk/teaching/dphil/>

1.4 The Mathematical and Physical Life Sciences Division Graduate Handbook

The division also produce a graduate handbook which you should make sure you are familiar with. This can be found at:

<http://www.mpls.ox.ac.uk/intranet/teachingandlearning/graduateprog.html>

1.5 Notes for the Guidance of Graduate Students in Mathematical Sciences

This handbook is intended to supplement the *Notes for the Guidance of Graduate Students* that will be given to you in your introductory pack.

2 Finding your way around

Your academic life in Oxford will involve two intimately connected but distinct institutions. You are a member both of a college and of the University; your supervisor is a member of the Computing Laboratory and possibly a member of a different college. Your college will also allocate a college advisor to you.

In principle, the University exists to enable you to study for a research degree, to monitor your progress, to examine you at the end of that study, and to award you a degree. Your College exists to guide your study and to advise you. Admissions of students to Oxford, and their academic and personal well-being, are principally the concerns of the colleges. Traditionally, most of the teaching was organised by and between the colleges; however in science subjects in particular the central provision of expensive equipment has led to an increased role for departments like the Computing Laboratory.

2.1 The Computing Laboratory

The Computing Laboratory houses lecture theatres and seminar rooms in which most of the university lectures in Computer Science take place. It also runs a network of computers and other facilities devoted to the teaching requirements, and administers lectures, practicals, projects and some University-wide classes in Computer Science.

The head of department of the Computing Laboratory is Prof. Stephen Pulman, and the academic administrator is Christine O'Connor.

The building

The postal address for the Laboratory is:

Oxford University Computing Laboratory
Wolfson Building
Parks Road
Oxford, OX1 3QD
England

After having occupied a succession of adapted buildings in and around the University Science Area, the Computing Laboratory is now housed in a building specifically designed, constructed and equipped for it, largely funded through the generosity of the Wolfson Foundation and the Wolfson Family Trust. The **Wolfson Building** stands at the south-eastern corner of what is known as the Keble Road Triangle consisting of Keble Road, Banbury Road and Parks Road. The new **e-Science building** next to it houses OeRC (Oxford e-Research Centre), doctoral training centres and the Software Engineering programmes.

Lecture Theatres A and B are on the lower ground floor and first floor respectively: they can be reached through the door to the right of the main Parks Road entrance (in the new extension set back from the road), as can the seminar room 051.

Room numbering

The number system for rooms is made up of a three digit number which designates the floor level in the building as well as the actual room number. Hence room numbers beginning with 0 are in the basement, room numbers beginning 1 are on the

ground floor, room numbers beginning 2 are on the first floor, and so on up to room numbers beginning 5 which are in the attic.

Opening hours

The Wolfson Building opens at 8:30 and the doors are locked at 17:15, Monday to Friday, excepting closed periods (i.e. Bank Holidays out of term time). Detailed rules governing access to the Computing Laboratory are as follows:

Access to the Computing Laboratory

An entry-card system controls access to the Wolfson Building outside normal opening hours. You will also need a card to be able to access your pigeon hole. This applies to the main Parks Road entrances and the 11 Keble Road entrance of the Wolfson Building. The front door of No. 8 Keble Road has been alarmed and should only be used in an emergency. You will not be able to gain access through the OeRC entrance (7 Keble Road). The cards also control access within the building from the Lecture Theatre areas. University cards, if you already have one, will be activated as the Laboratory's entry card, when you have signed the enclosed declaration (yellow sheet included in your information pack). To activate your entry card you will need to take your University Card to Brenda Deeley (106). You will need to select a four digit pin number.

Rules

The rules for using this system are:

1. A card and individual PIN will be issued to all staff and graduate students who require access to the Wolfson Building. In the case of graduate students, a University Card is required. Please complete the yellow form in your induction pack.
2. The PIN must be kept secret and under no circumstances should be written on the card or in the wallet where the card is kept. (Should an entry card be lost, access cannot be effected without knowledge of the PIN. The card can also be barred when it is reported lost).
3. Each card will be set to operate for the period of the student's stay in Oxford.
4. Cards will be issued on a personal basis and must not be loaned or passed on to another person.
5. No-one should allow access to another person unless they are prepared to 'escort' them throughout their stay in the building.
6. When a card is used to gain access to the building, the system keeps a record of that use for a period of approximately six months.

Keys

Keys are required for D.Phil. Offices. These are issued by the Brenda Deeley (106). A deposit of £20.00 per key is required. This is refunded in full when the key is returned. Keys for other departments are usually obtained from that department and with a similar deposit being required. If you lose a key or entry card you should report it immediately to the Administrator or Jo Leggett who will advise on any further action and arrange for a replacement to be issued. There is usually a charge for a replacement.

Social area

Although much of the social and domestic life of the University takes place in colleges, the Department does have a Common Room which is located on the ground floor. Social events take place in the Atrium and there is a vending machine in the cloakroom opposite Lecture Theatre A (042).

It is forbidden to take food or drinks into lecture rooms, seminar rooms or computer rooms.

Pigeon holes

All students and staff are allocated a pigeon hole in room 157 (near Reception). All post will be put in your pigeon hole, together with any messages. **It is extremely important that you check them regularly.** Please note that the room can only be accessed with your entry card.

Communication and electronic mail

The University Computing Service automatically provides e-mail facilities for all new students, at the same time as you are given a University Card. You will also register with the Computing Laboratory to use departmental computers, and can use these accounts to send and receive e-mail.

E-mail is, generally speaking, a good way of contacting members of the Computing Laboratory and most of the other academic staff you will need to reach.

We have two main ways of communicating with graduate research students:

- **Email:** Please read your email frequently as there may be an urgent/important message for you from one of us. This will go automatically to the address the Laboratory sets up for you. If you regularly use a different email address then you must ensure that your Comlab address is forwarded to it. Instructions on how to do this can be found at <http://www.comlab.ox.ac.uk/internal/comp-net/guides/email/forward.html>
- **Paper copy to your pigeon hole:** You will be allocated a pigeon hole in the post room which is just inside the main door of reception. Again, please check your pigeon hole on a frequent basis as there may be important information waiting for you.

Messages for staff may be left with the receptionist of the Wolfson Building or in their pigeon hole (Room 157).

Access to course material pages from outside ox.ac.uk

There is a lot of course material on the ComLab web pages. This can be accessed from outside the Oxford domain, though it is password-protected.

If you try to access these pages from outside ox.ac.uk you will reach a page saying:

“Teaching material pages are only accessible to registered students and staff of Oxford University connecting from a host in the ox.ac.uk domain. Web access to the teaching material pages from outside the University is restricted to a limited number of colleagues (such as external lecturers and external examiners) who have been registered with a ‘course materials’ username and password (who should use this link please).”

Following that link will produce a pop-up, to which you should provide:

Username: comlab

Password: Tur1ng

(that's the digit 1 in the middle).

This material is made available for your use only (it is copyright of the authors). You should not pass it on to anyone else, nor should you reveal the password to anyone.

2.2 The Staff

The academic staff you will encounter are likely to be in three kinds of job. There are college tutors and college lecturers; there are University Lecturers and other university staff who are employed to give lectures, to organise the degree courses and to examine; and there are departmental staff who are employed to run practical work and organise laboratory work and classes. However, most of the academic staff that you meet will be in at least two of these categories.

You have been assigned a supervisor, or perhaps joint supervisors, who are normally members of the Computing Laboratory. Your college has allocated someone as your college advisor: this person should be your primary source of advice about collegiate matters. Your college advisor may be a computer scientist, a mathematician or an engineer and should meet you each term to hear about your progress.

You will find the list of staff in Appendix [B].

2.3 Other departments

Oxford University Language Centre

The language centre provides courses and other resources to help you learn modern foreign languages, or to keep up and develop your skills. It is situated on the Woodstock Road just north of St Giles church, and at the back of the Computing Service building.

The Examination Schools

The Examination Schools is the department of the University which administers public examinations. It is housed in a building on the south side of High Street, east of University College.

3 Terminology

Matriculation

Matriculation is the formal University admission procedure and is organised by your college.

University terms

The three University 'full' terms are:

Michaelmas (October–December),

Hilary (January–March)

Trinity (April–June)

Each term lasts eight weeks. But terms simply set the periods during which formal instruction is given by way of lectures, seminars and tutorials. The University functions throughout the year and as a research student you will need to work in vacation as well as in term time (apart from reasonable breaks).

Subfusc

The University Examination Regulations state that all members of the University are required to wear academic dress with *subfusc* clothing when attending formal university events such as matriculation and university examinations. It consists of:

For women A dark skirt or trousers, a white blouse, black tie, black stockings and shoes, and, if desired, a dark coat

For men A dark suit and socks, black shoes, a white bow tie and plain white shirt and collar

Candidates serving in HM Forces are permitted to wear uniform together with a gown. (The uniform cap is worn in the street and carried when indoors.)

Graduate terminology

The following are some of the terms that are particular to graduate research students.

PRS (Probationer Research Student) – The name given to students when they are admitted to study for a research degree, usually held for the first year and no longer than six terms.

Transfer of Status – The name given to an examination that allows the student to progress from PRS to advanced status, such as D.Phil. or Master of Science by Research.

Confirmation of D.Phil. Status – The name given to an examination that allows the student to progress to the submission of the D.Phil. dissertation, which usually takes place after two years and must be within nine terms.

GSS (Graduate Supervision System) – An on-line system for termly reporting by graduate students and their supervisors regarding the progress of the research degree.

Graduate Studies Office (GSO) – An administrative centre for graduate studies, which manages the process of monitoring student progress, application for suspension and final examination. These applications are made on GSO forms which are available from:

<http://www.admin.ox.ac.uk/gso/forms/>

DGS (Director of Graduate Studies) – The person responsible for graduate studies and students in the department. He/she manages the administrative arrangements for supervision, transfer/confirmation of status, extensions of time, and thesis submission and examination, including appointment of examiners. In the Computing Laboratory currently the DGS is Marta Kwiatkowska and she is assisted by the Graduate Admissions Secretary, Julie Sheppard.

4 Studying for a research degree

You have chosen to study for a research degree, either D.Phil. or M.Sc. by research. You may have just completed an undergraduate degree, or perhaps a taught Masters course. If so, your study has so far been organised for you – the courses were designed, lectures and practicals prepared, textbooks selected, and examinations set. A research degree is very different, in that you will have the responsibility for managing your learning, including determining a problem to study and carrying out the work. Your *supervisor*, or in some cases joint supervisors, will guide you in your research, and further support will be available from the academic and college *advisors*.

4.2. The Nature of Research

Some students arrive in Oxford knowing precisely what their research topic will be; others have little more than an idea of its general area. Someone once described research as ‘Finding out something to find out, then finding it out’; the first part is often harder than the second. Consequently some students focus rapidly on their thesis work whilst others spend much of the first year before beginning to do so. However, it is important for all research students—even those who know precisely what their field of research is going to be—to acquaint themselves with as much as possible of the work going on in the Laboratory. It is vital for life-after-graduation that you be able to relate different areas and views. There are many points in common between research fields and many useful ideas can be borrowed from fields other than your own. The Laboratory’s seminar series and advanced courses are held partly for this purpose.

What characterises research in the Computing Laboratory at Oxford? It is based on the intelligent gathering of evidence in the disciplines of Computer Science or Numerical Analysis, achieved by asking and answering questions. That activity normally results in a novel and productive view being taken that supports a number of new results whose importance can be demonstrated in the computing or numerical systems whose study led to their discovery. There is usually a theoretical component that endures beyond the examples considered, and a practical component, important because it justifies and inspires study of the theory.

Research thus does not consist merely of completion of a program, even a complex one—a view favoured by amateur programmers! Nor does it consist of the discovery of a piece of unapplied mathematics. The blend of theory and practice is fundamental to our view of research. It is one we wish, above all else, to convey to our students.

Research is not easy! Sometimes long periods can pass without any progress seeming to take place; at other times everything seems to happen at once. You should not get too down hearted if the going appears to be hard at times—most of the lecturers and research staff have had a similar experience so there is always someone sympathetic to talk to. But you need to be proactive in seeking help, from staff and peers.

4.1 Roles and Expectations

Supervisor. When you arrive in Oxford you should already know the name of the supervisor provisionally allocated to you (on the basis of interest and previous experience). It is up to you to make contact soon after you arrive. As your first year progresses, if both you and your supervisor are content with it, the arrangement will become permanent; otherwise it will be changed. It will also be changed if it becomes

clear that your interests are converging on a research topic which can be supervised more appropriately by another member of staff. In some cases joint supervision is arranged. The close working relationship with your supervisor is likely to be the most important element during your research life in the department, and much of the first year will be spent on arriving at a good working relationship. The nature of this relationship will depend to a large extent on individual work patterns, but some useful guidelines can be found in the EPSRC booklet *Guide to Good Supervisory Practice*:

<http://www.epsrc.ac.uk/CMSWeb/Downloads/Guidance/Supervision%20Guidelines.pdf>

In spite of the range of styles of interaction between supervisor and research student, it is important that you meet on a regular basis. We advise that you should meet with your supervisor *at least* 4 times per term. A more typical pattern is *weekly*, at least until you reach the stage of writing up your dissertation.

Appendix [E] includes an extract from the regulations describing the responsibilities of the student and supervisor.

Academic advisor. You have also been allocated an *advisor*: a member of staff of the Computing Laboratory with whom you may talk, as an alternative to your supervisor, about research or problems unrelated to work. Your advisor will probably be involved in monitoring your progress and may stand in if your supervisor is absent (for instance on sabbatical leave). Thus you should keep your advisor informed of your interests and progress. Nearly everyone finds that the process of explaining their work clarifies it, and your explanation will benefit by your having to assume less background knowledge when explaining to your advisor.

College advisor. Your *college advisor* is a member of your college who has been assigned to you to provide an additional source of support.

If something goes wrong... If you find any aspect of your supervision unsatisfactory and you feel unable to discuss it with your supervisor, you should contact your advisor, the Director of Graduate Studies or the Head of Department.

5 First year

All graduate research students, including D.Phil. students, are initially registered as *Probationer Research Students (PRS)*. After a year they are expected to apply for transfer to *advanced* status, that is, D.Phil. or M.Sc. by Research.

5.1 Computer Science Students

In order to ensure that you have a reasonably broad working knowledge of computer science, and reasonable depth surrounding your research topic, you are expected to attend courses and be assessed on their content. You will need to attain a satisfactory performance in these courses in order to proceed to advanced status. In consultation with your supervisor you should choose *four* M.Sc. or advanced undergraduate courses during your first year if studying for D.Phil., and *two* if studying for M.Sc. by Research. You can find information about courses in Section [8]. A specially designed reading course may provide an alternative to a lecture course. If your supervisor deems you to have adequate background already, you may take fewer courses. In the extreme case (for example, if you studied the topic of your research to an advanced level already and have your supervisor's support) you may apply for complete exemption from coursework. In some cases your supervisor may recommend this particular subject be followed in the second year, rather than as one of your first-year subjects.

Choice of courses should be made in consultation with your supervisor very soon after your arrival. By Friday of week 1 of your first term you must complete a form (headed 'PRS Course Selection') indicating which courses you wish to attend, with reasons to support any exemptions. The form is to be signed by your supervisor and submitted to the Secretary for Graduate Studies for approval by the Director of Graduate Studies. You must register for each M.Sc. course chosen and you must seek permission from the lecturer to attend each undergraduate course chosen, because of space restrictions. Changes to your coursework selection, as the year progresses and your interests focus, are dealt with by resubmitting the 'PRS Course Selection' form (and seeking permission to attend the new courses). The method of assessment for each course is to be decided in discussion with your supervisor; the default is that you complete the same work, for the same deadlines, as other course participants. A reading course may be assessed by essay, problem sheets, or examination. If you have difficulty in understanding a lecture, please discuss it with your supervisor, the lecturer, or the demonstrator for the course, who will make an explanation suited to your needs. If you find the lectures unsatisfactory in any other way, please tell the lecturer or the demonstrator. They are naturally keen to make every improvement.

In addition to lecture courses and individual research, you will be expected to participate in the research activities in your group (if appropriate) and the Laboratory, such as attending seminars, contributing to research group meetings and writing of research papers, as well as giving presentations, as agreed with your supervisor. There is also a broad range of skills training available to you within the Division and the University, see Section [10].

By the end of the first year, you should have gained sufficient experience to apply for Transfer to D.Phil. Status (see Section [7]).

5.2 Numerical Analysis Group Students

As a PRS or D.Phil. student in the Numerical Analysis Group, you are expected to participate regularly in group seminars. Most terms, there are two regular activities scheduled: the internal group seminar in the Fox Room on *Tuesdays* at 2–3 and the more formal <http://www.comlab.ox.ac.uk/seminars/cma/> seminar in the Lecture Theatre on *Thursdays* at 2–3 (preceded by a group lunch in Balliol College). The nature of the internal seminar changes from term to term. In addition, a very important part of your D.Phil. career is to acquire a strong foundation in numerical analysis/scientific computing, not just in your particular area of specialised research. The list available on the web at <http://www.comlab.ox.ac.uk/oucl/courses/dphil/y1crswk-nag.html> gives an outline of many of the principal topics of this field, with an indication of courses available at Oxford in many of the topics in question. A reading list is also available on the web at <http://www.comlab.ox.ac.uk/oucl/courses/dphil/readlist-nag.pdf> and PRS students should study it closely. D.Phil. students should aim to become knowledgeable in most of these areas. Specifically, the following is expected of first year (PRS) students during 2008–2009:

- attend the internal group seminar on Tuesdays 2–3 in the Fox room and give a presentation,
- attend the Computational Mathematics and Applications seminar each Thursday 2-3 in the Lecture Theatre,
- in Michaelmas Term, participate in the PRS Problem Solving Squad organized by Professor Trefethen,
- complete three additional courses.

Let us clarify the last of these bullet points. You are expected to take at least three of the courses listed on the web page cited above, completing and getting marked all the usual classwork or other assignments associated with them (but not written exams). For some courses there may be no assigned work, in which case another method of assessment will be devised. You will be given a checklist to indicate what your three choices are and how they will be assessed, to be signed by your supervisor and by Professor Trefethen. Some PRS students will have already done many of the courses above by completing an M.Sc. at Oxford. If for this reason there are not three courses suitable for you to take this year, then you should design a special reading project with a supervisor of your choice among the NA Group academics. Three courses is a minimum! Students are encouraged to do more than this, and to continue attending courses in their later years of D.Phil. research to ensure that they have a strong background in numerical analysis. By the end of the year, as discussed elsewhere, you should complete your Transfer Dissertation.

6 Second and third year

6.1 Computer Science Students

It is usually during the second year that the bulk of the work for the thesis is done. The activities, as agreed with your supervisor, should be mainly focused on research, which may vary depending on the study being theoretical or experimental; reading the literature more broadly; participation in activities such as specialist and departmental seminars; and writing posters and the first research papers for submission to workshops and conferences, including the student conference. It is important, though, that you take a broader outlook of your training. D.Phil. students are expected to demonstrate a range of skills by the time they graduate. The skills training at Oxford (see Section [10]) offers a broad range of courses, including leadership, presentation skills and team work. In addition, in the Computing Laboratory we offer the following training:

- Presentation skills seminar – this will cover the art of making verbal scientific presentations. All students are expected to attend, as this will provide you with an introduction to an essential research skill.
- Class teaching seminar – graduate research students are expected to attend the half-day training session run by the Laboratory in October. This was developed in collaboration with The Institute for the Advancement of University Learning and is devoted to teaching methods in computer science. It has been found useful, particularly by those wishing to develop their careers as academics.
- Demonstrating and tuition – on the undergraduate and M.Sc. courses run by the Department.

During the second and third year, as they become more confident technically, many D.Phil. students choose to do a small amount of paid tutoring, class teaching or demonstrating on M.Sc. or undergraduate course. This is valuable experience for your future career. Attendance at the demonstrating and class teaching seminars are essential prerequisites for teaching in the Laboratory. After discussion with your supervisor you should express your interest to Christine O'Connor, who will include your name and teaching preferences on a register. Your supervisor must give permission for you to undertake the amount of teaching work you propose to do.

At the end of the second year comes another milestone, Confirmation of Status (see Section [7]), which you have to have completed before submitting your thesis.

Following confirmation viva, during which the contents of the thesis and the timetable for completing the D.Phil. is approved, the third year is usually devoted to finalising the thesis so that it can be presented as a coherent D.Phil. dissertation, as distinct from a research paper. This is also usually a phase where the research has come to full fruition, so you will probably be busy submitting research papers – and having them accepted for publication and perhaps presentation at conferences. Funding for conferences is available, either in your research group or from the Laboratory, or college, for which you need to make a special application; see Section [9].

Around the end of the third year, normally after three and a half years, you are ready to submit your D.Phil. thesis and be examined. See Section [7].

6.2 Numerical Analysis Group

Numerical analysis PRS and D.Phil. students are expected to participate in at least the first two, and hopefully all three, of the following events held weekly each term:

- internal seminar Tuesday 2–3 in the Fox Room (usually Weeks 1–8)
- Computational Mathematics and Applications seminar Thursday 2–3 in the Lecture Theatre (usually Weeks 0–8)
- Group lunch in Balliol College, leaving from Room 206 at 12.45 on Thursday (usually Weeks 0–9)

In addition we hope that most D.Phil. students, each year, will

- attend one or two conferences, and if possible give a talk. (An event worthy of special note is the Dundee Conference on Numerical Analysis held at the end of June in each odd numbered year.)
- submit an article for publication in a journal or conference proceedings.

7 Monitoring progress

This section describes the mechanisms for monitoring progress of research degrees, including the main milestones that you will be expected to reach while studying for D.Phil. or M.Sc. by Research.

These processes are managed by the Graduate Studies Office, the administrative centre for all graduates at Oxford. The specific office that you will be dealing with is the MPLS Graduate Studies Office, see <http://www.admin.ox.ac.uk/gso/>. In the Computing Laboratory, the person responsible for daily oversight of these processes is the Director of Graduate Studies, assisted by the Secretary for Graduate Studies.

7.1 Termly Reporting: GSS (Graduate Supervision System)

From the 2008/09 academic year all graduate students will be invited to contribute to the termly reporting cycle, with the launch of the new online Graduate Supervision System (GSS) across the collegiate University.

The Graduate Supervision System will capture information reported by both student and supervisor(s), with details relevant to each student only being available to his or her supervisory team. The Graduate Supervision System will invite you to logon near the end of term and create a self-assessment report. You will be prompted to list completed training and training which is still required, as well as provide a comprehensive overview of your progress. You will also be able to set a flag to indicate if you have concerns with your progress, and this will be highlighted to your Supervisor, Director of Graduate Studies, and College Advisor. Your supervisor will then complete a report on your progress, and this will be available for you to view, as well as your Director of Graduate Studies, your College Advisor and the appropriate administrators.

Whilst it is not mandatory for students to complete a self-assessment report, it is a useful tool to reflect on your achievements and provides an opportunity to communicate any concerns to your teaching staff. Further details regarding use and access to the system will be communicated by email in Week 3 of Michaelmas Term.

7.2 Transfer to M.Sc. by Research or D.Phil. Status

All D.Phil. and M.Sc. by Research students are initially registered as Probationer Research Students (PRS). After a year you are expected to apply for transfer to *advanced* status by preparing a research report and thesis proposal and by being examined on them by two assessors. One of the assessors is likely to be your departmental advisor; the other will be chosen based on suggestions from you and your supervisor. Your supervisor, however, is forbidden by University policy from being one of the assessors.

When studying for D.Phil., if the assessors recommend that you be transferred to advanced status then you may be registered as a student for the degree of D.Phil. Alternatively they may recommend that you be allowed to apply for transfer to the status of a student for the degree of M.Sc. by Research. Finally, they may refuse to grant your application, in which case you are given one opportunity to apply again. It is important to ensure that you plan and carry out your work in the first year so that you will be ready to apply for transfer around the end of the year. Although the University regulations allow you to be a Probationer Research Student for up to six

terms, it is department and division policy that all Probationer Research Students are expected to transfer status by the end of *four terms*.

Students originally registered for M.Sc. by Research must also apply for transfer of status after the first year.

For details of the formal rules governing transfer, see Examination Regulations, 2008 p876 *Division of (Mathematical and Faculty Boards Physical and Life Sciences)*.

7.3 Application for Transfer

When you are ready to submit a research report and thesis proposal, you should acquire the appropriate forms (MAT.1 and GSO.2) from the Secretary for Graduate Studies, room 112, or can be downloaded from <http://www.admin.ox.ac.uk/gso/forms/>. These forms must be signed by both your supervisor and your College Secretary. Once the forms are complete, you should return them to the Secretary for Graduate Studies. There are two methods of applying for transfer from Probationer Research Student to advanced student status. These are known as 'Category A' and 'Category B'. Category B applications are rather rare.

Category A: If you have come straight from an undergraduate degree, you should prepare for the transfer examination during the first year of your research. This will involve preparing a qualifying dissertation, which consists of a research report and thesis proposal, and attending a course of advanced instruction planned in collaboration with your supervisor and advisor (as explained above). Such applications must be submitted no later than the Wednesday of the fifth week in your *fourth term* as a Probationer Research Student. You can also apply *before* the start of your fourth term, if you are ready earlier.

Warning: Most funding bodies, including the Engineering and Physical Sciences Research Council, will discontinue a student's grant if the University does not provide a certificate of good progress each year. The provision of such a certificate by the University is contingent on success in the transfer examination. *The Research Council's deadline for such certificates is very soon after the University's deadline for Category 'A' transfer applications. Since it is almost impossible to arrange transfer examinations at short notice, such students are advised to submit their application for transfer as early as possible in the summer vacation after their third term.*

Category B: If you already hold an M.Sc. degree, either from Oxford or elsewhere, you may make a 'Category B' application. In this case, the dissertation prepared for your M.Sc. examination may, with appropriate amendments, be used as your research report. You will still have to prepare a thesis proposal as well. This normally applies to cases where the student is continuing with D.Phil. research that began during the M.Sc. Such applications should be submitted no later than the Wednesday of the fifth week in your *first term* as a Probationer Research Student. If you are such a student and do not feel ready to transfer to D.Phil. status so early in your research you may submit a 'Category A' application instead. The following table summarises the categories, qualifications, deadlines, and documentation requirements for transfer of status applications.

Category	Holds M.Sc.	Deadline	New research report
A	No	Week 5 of Term 4	Yes
B	Yes	Week 5 of Term 1	No

The Laboratory policy is that students who *fail to apply* for a transfer examination before the start of their *fifth term* may be deemed ineligible for transfer to D.Phil. status and be expected, instead, to transfer to the status of a student for the degree of M.Sc. by Research. Students who fail to transfer to D.Phil. status before the end of their sixth term as a Probationer Research Student have their status as students in the University lapse. Essentially they will no longer be students here and have to leave.

7.4 Contents of the Qualifying Dissertation

The documentation you submit with your transfer application should have two components: a *research report* and a *thesis proposal*.

Your *research report* will be based on the research work you have done in your first year. For example, this could be a case study or a less ambitious problem that you have tackled. The report should describe the motivation for the research and its significance. Typically, it will include a literature review, summarising the current state-of-the-art in this area. It should also explain the theoretical background to your research, the results obtained, and the conclusions drawn from the work and their scientific basis. The expectation is that you will provide a polished, professional report on the initial research work you have done—demonstrating that you have both acquired a degree of competence in actually doing research, as well as the essential skill of presenting your work in a clear, organized, and scholarly manner.

The *thesis proposal* is expected to contain

- (a) a clear statement of the specific topic you have chosen for your D.Phil. research,
- (b) a description of how it relates to previous work in the field,
- (c) your strategy for achieving the research objective,
- (d) a summary of the significance and importance of your work, and
- (e) the scientific basis for how you intend to evaluate the results.

This statement is required for both Category A and Category B applications. Your proposed research topic should be well-defined and specific. It should admit of novel treatment, and it must be significant enough to be worthy of a D.Phil. if competently investigated. Your proposals for how you are going to approach the topic should be concrete, clearly explained, and of justifiable promise.

Your research report and thesis proposal may well be the first formal documents you produce under the guidance of your supervisor. It is important to realise that they will be assessed for style as well as technical content. Ability to write your ideas clearly and convincingly is an essential part of your training. For an excellent treatment of how to write technical documents, including LATEX tips, see N. J. Higham, *Handbook of Writing for the Mathematical Sciences* (2nd Edition), SIAM, which can be found in the library. University regulations say that the *total* length of your transfer documentation should be between ‘twenty-five and fifty typed pages (or fifteen to thirty printed pages of TEX, depending on font used)’. We would normally expect most of these pages to be taken up by your research report.

No degree is awarded on the basis of the transfer application, so the work described in your research report can (and normally will) form part of the final D.Phil. dissertation. If, however, you have made a Category B application and used your M.Sc. dissertation to qualify, this cannot be used as part of your final D.Phil. dissertation.

7.5 Qualifying Examination

The qualifying examination is informal (the regulations call it an ‘interview’) and so academic dress is not necessary. Usually there are just two assessors, chosen as described above. The assessors must certify they have considered both your coursework and your qualifying dissertation—and they are satisfied that these demonstrate you are capable of completing a D.Phil. in the time remaining. In making that decision they must be satisfied that the topic and approach proposed are suitable for study in the Laboratory, and that you have a good knowledge and understanding of the background needed, a clear and appropriate plan of work, and can describe your results clearly.

In the examination itself, the assessors are likely to concentrate on the contents of the research report, and will want to be sure that you can explain what has been achieved and respond to questions based either on the theory or results of your work. But they will also have a record of your coursework performance and any essays you have written, and you may expect the assessors to ask questions about your first year’s work generally. They will also want to be satisfied that you can explain and justify the thesis proposal for subsequent research. Although there is no *formal* commitment to carry out the proposed plan in detail, and you are free to exploit discoveries made later and to change direction, it is expected that by this stage you at least have a definite starting point.

In summary, the assessors must be sure that you have a specific, unsolved, and worthy problem to work on, that you have some definite ideas for approaches to solving the problem and that you have good chance of completing a D.Phil. in your remaining time (usually a further two years).

7.6 Confirmation of D.Phil. Status

The University Regulations require that doctoral students have their status *confirmed* before being permitted to submit a dissertation for examination. The Laboratory and the University take very seriously their duty to monitor the progress of research students, and confirmation of status is one way in which we do this. *Moreover, most funding bodies—including the Science and Engineering Research Council—will discontinue a student’s grant if the University cannot certify that progress has been acceptable each year.*

Confirmation of status is conditional on the preparation of a satisfactory research progress report and involvement in graduate activities such as attendance at seminars, publications, and presenting papers at conferences (see Section [8]). Evaluation of applications for confirmation of status takes the form of an oral examination with two assessors, based on your written progress report. The progress report does not have to be long. Its most important ingredients are:

- (a) a table of contents of your proposed D.Phil. dissertation,
- (b) a clear plan for any research investigations that remain to be done,
- (c) and a timetable for completing the writing.

Its purpose is to ensure that, after having achieved the main body of results in your second year, you have a clear idea of how they constitute a D.Phil. dissertation (as distinct from conference or journal articles). The assessors will be looking for evidence that you are able to complete a dissertation of D.Phil. standard with a modest amount of further work—no more than *three* more terms.

The Mathematical, Physical and Life Sciences Division expects confirmation of status to have been *completed* by the end of your *ninth term* from admission as a Probationer Research Student. The Laboratory therefore recommends that you apply for confirmation no later than the beginning of your ninth term. In order to allow enough time for your application to be assessed, your application, accompanied by a progress report, should reach the Graduate Studies Office by the end of 0th week of your ninth term. To apply for confirmation of status you need to complete Form GSO.14 and Form MAT.3. These are available from the Secretary for Graduate Studies, room 112, or from Graduate Studies in the University Offices. Once the forms are complete, you should return them to the Secretary for Graduate Studies.

7.7 Submission and Examination

When you and your supervisor are agreed that your thesis is within one term (and the vacation which follows) of completion, you should obtain form GSO.3 from the GSO website at <http://www.admin.ox.ac.uk/gso/forms/> and arrange for its completion. The form has sections which should be completed by your supervisor, and by your College. Your supervisor must suggest the names of examiners on this form, after consulting you: one internal (to the Computing Laboratory) and one external—plus a reserve for each. When the form has been handed in to the Secretary for Graduate Studies, room 112, it must be approved by the Director of Graduate Studies and two examiners will be formally appointed on the recommendation of the supervisor. Two copies of the thesis should be submitted *no more* than a term (and the vacation which follows) after this has happened.

Once the thesis has been submitted, the examiners will arrange a date for the *viva voce* (i.e. oral) examination. This is formal, so you must wear *subfusc*. After the examination the examiners will submit their report and recommendation to the Mathematical, Physical and Life Sciences Divisional Board. In many cases this decision is delegated to appropriate office holders under the aegis of the Board. It is because they can do no more than make a recommendation to the Board that the examiners are unable to comment to you on the outcome of the *viva*. No matter how much attention your supervisor or advisor has given to the technical details of the work, the final responsibility for the thesis rests with its author. It would be unwise of a student to expect the supervisor to *proof-read* a thesis; this is a task which can more properly be performed by friends.

For more detailed information on the regulations (in particular, for information on standards of typesetting and binding) consult the *Notes for the Guidance of Graduate Students in Mathematical Sciences*, issued by the Mathematical, Physical and Life Sciences Division, and the *University of Oxford Examination Regulations*. You should refer to Section [1] for how to access these materials.

8 Graduate activities

This section lists the main types of activities that every graduate research student should strive to engage in throughout the duration of their studies.

8.1 The Lecture List

The Division of Mathematical, Physical and Life Sciences publishes a lecture list for Mathematical Sciences just before the beginning of each term, as do all other Divisions of the University. Copies of the Mathematics list are usually available from the Receptionist in the Computing Laboratory or the Mathematical Institute and can also be found on the web at <http://www.maths.ox.ac.uk/notices/lecture-lists>. A single bound copy of the lecture lists of all the Divisions is kept in the Laboratory Common Room. Lecture timetables for the courses given in the Laboratory are also published on the pigeon-hole-room notice board. Depending on your interests it may also be useful to attend other courses—for example those of Engineering, Psychology, Physiology, or Philosophy. All members of the University may attend any publicly announced University lectures or seminars.

8.2 Seminars

Research seminars run weekly within the Laboratory, see <http://web.comlab.ox.ac.uk/seminars/> for more information. All graduate students are *expected* to attend the following series of seminars:

- Departmental Seminar. It is held on Tuesdays at 4.30pm in term. This usually features an eminent researcher from outside Oxford as an invited speaker, and the talks are normally aimed at a general computer science audience. Attendance at these seminars will help you broaden your knowledge of Computer Science beyond the confines of your own research area.
- Specialist or group seminars; for listing see <http://web.comlab.ox.ac.uk/seminars/>.
- Numerical Analysis Tuesday and Friday 14:00 seminars—see Section 7.3.
- Computational Mathematics and Applications Seminars. These seminars are run jointly by the Numerical Analysis Group and the Rutherford Appleton Laboratory (RAL). The seminars will be held on Thursdays at 14:00 (except where noted), in the Laboratory.
- The ‘Cakes’ Seminars, which are held on most Thursday afternoons at 15:00 in the common room, in term time. Their purpose is to encourage discussion among members of different research groups, and to give an opportunity to research students to sharpen their presentation skills. As the name suggests, cakes are provided.

In addition, there are many informal seminars and discussion groups in the Laboratory. Their meetings are usually publicised at relatively short notice on the notice-boards and electronic newsgroups and web pages. You should check <http://web.comlab.ox.ac.uk/news/> or the display at the Reception, Wolfson building.

8.3 Teaching

All research students are permitted to teach for up to six hours a week during the course of their degree. This teaching may include demonstrating in one of the

department's software laboratories, usually arranged by one of the Departmental Lecturers, or giving College tutorials, usually arranged through one of the tutors. The teaching is paid for by the department or college. In both cases you should ensure that you get your supervisor's permission in advance.

Many of you will have no previous teaching experience, but to give you some insight into what teaching at Oxford involves, a half-day training session on teaching methods is held at the beginning of each academic year. This is run by the Laboratory and was developed in collaboration with The Institute for the Advancement of University Learning. It is expected that all new D.Phil. students will attend this course. D.Phil. students are not allowed to help with class teaching and marking unless they have attended the seminar on class teaching beforehand.

8.4 Student Conference - Computer Science Students

The Computer Science Student Conference is usually held early in Michaelmas Term. It has been designed to be attended by all D.Phil. students, faculty and other interested students. It contains chaired sessions of talks, posters, a buffet lunch, and a reception with prize giving. The Conference is usually run by an organizing committee of D.Phil. students.

All D.Phil. and PRS students entering their second year are expected to submit an abstract of not more than 2 pages. D.Phil. students in later years are strongly encouraged to submit abstracts as well, and all newly-arrived PRS students should attend the conference. It is expected that students will submit an abstract of the work they have recently been doing. They may have given a cakes talk on the work (all to the good) or perhaps are summarising new results which have not yet been presented (even better). Students completing their first years may find themselves submitting an abstract arising from their transfer dissertation. In all cases students will gain from the experience. The Organizing Committee will choose, from those abstracts, a programme of talks and posters. Chosen talkers will be notified in advance of the conference, to give them time to prepare. Tea, coffee and a sandwich lunch will be provided for attendees. The conference will end with a drinks reception, also in the Atrium, during which the prizes will be announced. Prizes will be awarded for the best presentation, best demonstration and best abstract. Conference proceedings, containing all the abstracts, will be appearing on the Laboratory website and will also be handed out to attendees.

9 Graduate resources

9.1 Computers

The Laboratory supplies all PRS and D.Phil. students with IT provision in the form of a computer workstation or PC for their own use in their office. This is connected to the Laboratory's network and backed-up user directory file servers. This equipment is supplied in order to give you a basic provision in information technology for the purposes of preparation of reports, papers, and your D.Phil. dissertation. It is also intended to provide you with what might be called the basic 'IT tools' for research: word processing, email, internet connectivity, connection to the World Wide Web, and backed up file store services.

For many students, their Laboratory-supplied PC will also be sufficient to serve as their computing equipment for what might be called 'experimental use'—e.g. writing and testing computer programs, or running research software tools. Some students, however, will need access to more substantial computational resources or special software. There are several options. If you are working in a research group or are connected to a funded research project, then the group or project is likely to have experimental equipment that you can use. Consult your supervisor about this. There are also two dual-processor servers available for Computer Science research student use. They can be accessed by connecting using SSH to jet.comlab.ox.ac.uk. Students in the Numerical Analysis group also have access to two servers, which can be found by SSH at henrici.comlab.ox.ac.uk. The Computing Laboratory's teaching network (used by undergraduates and M.Sc. course students) comprises 83 PCs running Linux and in the case of M.Sc. machines in room 379, dual boot into Windows. Students requiring fast parallel computation may be able to access the machine clusters at the Oxford Supercomputing Centre; see the Oxford Supercomputing Centre's website, <http://www.osc.ox.ac.uk>. For details of the resources available, contact information and the process for gaining access.

Finally, if a student's research needs to use exotic or specialised equipment, expensive commercial software, stand-alone machines with root access for systems programming, or any other special provision, then this should have been discussed and agreed with their supervisor before undertaking doctoral work with these requirements. Special equipment like this must be funded through external research grants obtained by the supervisor or research group. The Laboratory is not routinely able to fund the unforeseen acquisition of specialised experimental equipment for individual student projects. For more details of the Laboratory's computers and networks, see the web pages at

<http://www.comlab.ox.ac.uk/internal/comp-net/>

All computing equipment provision in the Laboratory is overseen by the Laboratory's Equipment Committee. See the Lab's internal web pages for details of the membership of this committee:

<http://www.comlab.ox.ac.uk/internal/admin/committees.html>

The graduate student representatives attend the IT Committee. All students need to complete an application form to use Computing Laboratory computing facilities. A form is enclosed with your information pack (see also Appendix [H]). Oxford University Computing Services (OUCS) runs introductory courses throughout the

year. These courses will be helpful for those of you who have had less opportunity of hands-on experience with computers. They will also help you to explore facilities available at Oxford University which, although possibly not required for your research, may be of interest to you. OUCS is based at 13 Banbury Road—opposite the Department of Engineering Science. There you will find information on its courses, also available at <http://www.oucs.ox.ac.uk>.

9.2 Using your own Computer

You should not find it essential to have your own personal computer. On the other hand, the Laboratory does not normally supply computers for use at home or in your college, and you may find it convenient to have your own. The Laboratory's computing facilities can be used remotely from personal computers attached to the University network or elsewhere on the Internet, provided they have an SSH client and either X server software or VNC client software. For Windows, the Exceed X server software is available from OUCS for a nominal charge and the PuTTY SSH client is available as a free download, as is VNC. Before any personal computers may be used in the Laboratory they must be tested for electrical safety and then checked for security patching and anti-virus software. Only after these checks have been passed will they be authorised for connection. Machines running illegal copies of the Windows operating system or other software will not be connected to the Laboratory network and should not be brought into the building. Similar rules probably apply to network connections in college rooms.

9.3 Laser Printing

No restriction on the use of laser printer output is made, but we do monitor individual totals. Please make only single copies of output and use the photocopiers to duplicate them if required. Multiple copies of documents cause delays for other users, so please do not abuse the privilege. We reserve the right to charge for excessive use.

9.4 Photocopying

Photocopiers are available for use by staff and students on all floors of the Wolfson Building.

The copier in the Library is only available to copy articles etc. from journals (subject to copyright laws) and must not be used for general copying. The other copiers can be used by anyone, but please seek instruction from Jo Leggett (Room 106) and always report any faults or problems so that we can get the machines repaired. Private copying is monitored and maybe chargeable. Copying in the Radcliffe Science Library or the Bodleian Library requires a special copy card. This can be obtained from Michael Neville (room 240) and will require you to pay an initial fee of £5 (for which a receipt must be obtained) to put a 'credit' on the card during your first visit to the Radcliffe Science Library. Michael will refund this £5 on production of the receipt. When you leave the Laboratory you should return the card to Michael Neville. If you lose your card, you will have to pay the cost of a replacement 'credit' so please look after it carefully.

9.5 Conference Funding

Presentation of papers and attendance at scientific conferences and workshops is an important—perhaps even essential—activity for the practising scientist. It enables you to communicate your results to the community, to keep up to date with the work being

done by other researchers in the field and share ideas with them, and to get feedback on your research.

The Computing Laboratory is sometimes able to assist with funding to attend scientific conferences or workshops. Priority is given to students who are attending a conference in order to present a peer-refereed paper. Students who have other sources of travel funding, notably students supported by research project funds, are encouraged to seek support from those sources before applying to the Laboratory.

You can apply for funding by completing a form from the Secretary for Graduate Studies, room 112, or from the Numerical Analysis Group Secretary, room 209. You must get your supervisor's written support and you must apply *well in advance* of the conference you want funding for. Requests from research students in computer science will be considered by the Director of Graduate Studies; requests from research students in Numerical Analysis will be considered by the head of the Numerical Analysis group. If your request is approved, the Computing Laboratory will normally pay up to half of actual substantial costs (e.g. for international conferences) and all of actual small costs (e.g. approximately £100 for local or short events). Colleges are often able to make a contribution to the cost of presenting papers at conferences, so it is worth checking with your College.

9.6 Publications

Each group publishes a series of either Research Reports or Technical Reports and a series of Monographs. These are distributed within the Laboratory and to the wider academic community, and provide a speedy way of publicising the work of the Laboratory. Publication in these series can lead (and has led) to fruitful contacts with fellow-researchers and organisations who may wish to apply the research. Research students may be encouraged to publish results in the form of a Research Report before embodying them in their thesis or submitting them for journal publication. Feedback gained from members of the Laboratory can be very helpful indeed in guiding further work. Guidelines for the typesetting of reports and monographs are available from the Librarian. Students wishing to publish their work in the form of a report should first show it to their supervisor, and obtain approval from the monograph editor.

9.7 Libraries

The Computing Laboratory Library

The Computing Laboratory Library contains books, monographic series, journals, technical reports and past theses covering the main research interests of the Laboratory. It is principally for use by graduate students and staff, and is situated on Level 2 of the building.

Opening hours: Library staff are normally available from 09:00–17:00 (except 13:00–14:00). The library remains unlocked at other times.

Registration: you will be pre-registered but you must confirm your registration by bringing your University Card to the library before you begin to borrow.

The Catalogue: books and journals are listed on OLIS (the University-wide online catalogue).

Borrowing: members are limited to 12 books at any one time. Books may be borrowed for 3 weeks at a time with possibility of renewal for a further three periods

of three weeks unless a book has been recalled by another reader. Books are borrowed using the automated self-issue system. Please ask if you have problems using the machine. No journal or part of a journal may be borrowed.

Short-loan Collection: books in the short loan collection are held in the Library Office and may be borrowed for 5 days. The short loan collection is mainly composed of books listed on Reading Lists for the M.Sc. courses.

Web Pages: See <http://www.comlab.ox.ac.uk/internal/library>

Other services: The library also contains copies of the M.Sc. and D.Phil. theses submitted by students attached to the Laboratory and past examination papers.

Contact the Library: Michael Neville (Librarian), Aza Stephenson (Library Assistant), telephone 73837, e-mail library@comlab.ox.ac.uk.

Other Library Resources

The most relevant libraries elsewhere in the University are the Radcliffe Science Library, the Whitehead Library (at the Mathematical Institute for numerical analysts and formal mathematicians), the Engineering Science Library (especially for those interested in robotics and machine vision) and the Hooke Library. Material that is not held in Oxford may be available on inter-library loan. Please consult the Librarian about loans from outside Oxford.

Electronic Journals: see <http://www.bodley.ox.ac.uk/elec-res.html>

10 Skills training

Skills training is seen as an increasingly important element of your graduate course experience. The University provides a wide range of skills training opportunities.

10.1 University Skills Portal

The Skills Portal, <http://www.skillsportal.ox.ac.uk>, is a website for all research students, postdoctoral researchers and their supervisors at Oxford. It brings together a range of information about transferable skills development and has details of skills training courses, seminars and workshops offered throughout the University in a searchable database. There are links to online resources and tips on subjects such as leadership, team work, project management and teaching skills. It also gives advice on getting the most from your time at Oxford and putting yourself in the best possible position to succeed in your career, whatever it might be. The Skills Portal Forum is the place to ask questions, discuss issues with other researchers and make your views known to the people who organise the training. In addition, there are regular emails about Skills Training Bulletins.

It is your responsibility to record the training you have undergone and also to communicate your training needs.

10.2 Presentation Skills

The most important thing to keep in mind is that research presentations are meant to communicate your work to a general audience. A talk should therefore start by setting the scene, posing the questions you attempt to answer, and explaining why these questions are relevant. It is much more important that you give an intuitive feel for the field you're working in rather than show the technical details of a solution. You need a good understanding of where you are on the map of computing science, and why you're there.

Any talk, especially a short one, needs a lot of preparation. Unless you already have given dozens of seminars, you won't be able to tell whether your seminar fits the time limit simply by writing out some key points you intend to mention. The only solution is to practice for yourself, perhaps in your research group meeting, or for an audience that consists of a friend and your supervisor. That will also help you to think of the right formulations for your thoughts. Finally, it makes sense to study the text of some 'model lectures' to learn the fine tricks of the trade that make a truly captivating presentation. Two examples you may find useful are [1,2]. More good advice can be found in [3]. Good luck!

References

- [1] R.C. Backhouse. Making formality work for us. EATCS Bulletin, 38:219-249, 1989.
- [2] D.E. Knuth. Theory and practice. Theoretical Computer Science, 90:1-15, 1991.
- [3] S.L. Peyton-Jones, J. Hughes and J. Launchbury. How to give a good research talk. Available on John Hughes's home page at Chalmers, <http://www.cs.chalmers.se>.

11 The University and you

11.1 Joint Consultative Committee with Graduates

There are graduate student representatives, currently Janice Giudice and Jim Whitehead on the Faculty of Computer Science which meets on the Thursday of sixth week. Please tell your representative of any matters or questions you would like raised at the Faculty meetings. The student representatives also attend the Joint Consultative Committee with Graduates, the remit of which is printed below:

STANDING ORDERS

Joint Consultative Committee with Graduates

There shall be a Joint Consultative Committee with Graduates comprising the Director of Graduate Studies and two members reading for research degrees, one doing research in Computer Science and one from the Numerical Analysis group. Committee members shall be elected from amongst graduate students admitted by the Computing Laboratory. When a position becomes open it will be advertised by the current graduate members, who will invite graduate students to contact them indicating their interest in serving on the Committee. Elections may be held if more than one person steps forward for a position, in which case election shall be held by email and be decided by a simple majority. If only one person steps forward, then three supporting votes will be required to appoint the said person to the Committee. The voting will be done by email and the results brought to the next meeting of the Committee. The Committee may operate, if necessary, without its full complement of places having been filled. The committee shall be concerned with matters such as training, supervision, and research facilities for research degrees students.

The Director of Graduate Studies shall chair the committee. The Academic Administrator or another member of Computing Laboratory staff shall act as secretary to the committee. The minutes of the Committee shall be forwarded to the Graduate Studies Committee.

The Committee shall be able as of right to address a communication direct to the Departmental Management Committee or the Research Committee of the Computing Laboratory depending on the matters involved.

Unless the Chairman shall order otherwise, the committee shall meet at 12:00 noon on Monday in the fifth week of each Full Term. Your representative will be happy to communicate to the committee any matters or questions you would like raised.

11.2 University Gazette and Oxford Blueprint

The Gazette is published weekly, in term time, and is the official publication for University business, regulation changes, meetings etc. It is available in all the University and College Libraries and in the Common Room on the ground floor. Oxford Blueprint, a newsletter for University and college staff and students, is published in 0th, 3rd, 6th and 9th weeks of term. It contains news, interviews and features reflecting the diversity of activity across the University, and an events diary will be included.

11.3 University Club

The University Club provides a social and recreational venue intended to serve the University's academics, postdoctorates, staff, postgraduates, alumni and those who have retired from academic or staff positions. To apply to become a member of the University Club, please visit the Club's web site: <http://www.club.ox.ac.uk> and fill out the on-line membership application form (accessible via the 'Membership' link). On-line applications are preferred, but if you do not have access to the Internet, please complete the application form in your graduate pack and hand in to the reception desk, or, send them to Reception at the University Club. Applications may take two weeks to process. Once processed your University card will admit you to the club.

12 What next?

12.1 *Becoming an academic*

Many of our graduates continue on to successful research and academic careers, which typically begins with a postdoctoral research position. A number of Junior Research Fellowships are available at Oxford, and Engineering and Physical Research Council, Royal Academy of Engineering and the Royal Society each offer schemes to fund postdoctoral fellows. There are also many postdoctoral research positions and lectureships advertised at UK universities and abroad. See the University website for contract researchers <http://www.careers.ox.ac.uk/homepage/crs> for career advice, including training. Also talk to your supervisor and the Laboratory research facilitators about your career plans; see <http://www.comlab.ox.ac.uk/resources/> for listings of available funding and calls for proposals.

12.2 *Vitae - Online Career Development Resource*

Vitae is an organisation that is committed to enhancing the quality and output of the research base in the United Kingdom through supporting the training and development of the next generation of world-class researchers. It is funded by the Research Councils UK, managed by CRAC: The Career Development Organisation and delivered in partnership with regional universities. Sections of the Vitae website are dedicated to career development options for e.g. early career research staff; for more information see

<http://www.vitae.ac.uk/1269/Research-staff.html>

12.3 *Careers in IT*

Information about careers is provided by Oxford University Careers Service, 56 Banbury Road; the Computer Science specialist there is Denise Best (Tel. 274739). The Careers Service organise many events to help you choose a career that suits you, and to put you in touch with recruiters. Their website is:

<http://www.careers.ox.ac.uk/>

You are urged to contact the Careers Service for detailed information on careers, and also for advice on compiling a CV, on how to apply, and on interview technique. Information on general job vacancies in IT can be found on our website at:

<http://www.comlab.ox.ac.uk/news/>

Safety Information

These notes give some information about the Laboratory's safety arrangements. For further information, please contact the [Departmental Safety Officer](#).

A.1 Action in case of emergency

To summon the **FIRE BRIGADE, AMBULANCE SERVICE and/or POLICE, DIAL 999**. Note that 999 can be dialled from any internal University telephone extension, even if it is otherwise barred from making outside calls.

For **SERIOUS ACCIDENTS** or **FIRES** on University premises, immediately after arranging for the emergency services, telephone again either the *University Safety Office* (ext 70810), or if the Safety Office is unmanned, the *Security Services* (ext 89999).

To summon the **SECURITY SERVICES**, dial 89999.

Remember that unless there is a continuing risk to others or to property, the law requires that in cases of serious accidents or fires the scene must remain undisturbed until it is examined by the Health and Safety Executive, the University Safety Office and Trade Union safety representatives. Some types of serious accident must be reported immediately. In those cases, the Safety Office is responsible for contacting the Health and Safety Executive.

A.2 First Aid

The department arranges in-house first aid training for new graduate students, normally through a two hour session in the week before Michaelmas Term. Any other member of the department interested in attending such a course should contact the [Safety Committee Secretary](#). Several members of staff have taken part in extended first aid training, and [a list of Qualified First-Aiders](#) is posted in the entrance hall of the Wolfson Building; their names are also marked on the departmental telephone list. **First Aid boxes are located with each of the qualified [first aiders](#).**

A.3 Fire

There are blue **FIRE ACTION** notices in each building. Please read these *before* there is a fire!

If you discover a fire, immediately operate the nearest fire alarm call point (these are red, and are situated in the stair wells and at each emergency exit), and then attack the fire, if possible, with the fire extinguishers provided **but under no circumstances putting yourself or others at risk**. The receptionist or the senior person present should call the fire brigade immediately.

On hearing the fire alarm, leave the building **immediately** – use the nearest available exit, close all doors as you leave, do not stop to collect personal belongings. Do not use the lift – if you are unable to use the stairs, please wait inside the stairwell nearest the lift for the fire brigade to rescue you. Do not re-enter the building unless authorised to do so. Familiarise yourself with fire exit routes from the buildings, and relevant assembly points. The assembly point for the Wolfson Building is on the south side of Keble Road by the chapel of Keble College – do not cluster at the exits to the buildings.

Fire alarms in the Wolfson Building are sirens. It is occasionally necessary to test the alarms, but notices are always posted beforehand, and the alarm sounds only for a few seconds – assume that any fire alarm sounding for more than five seconds is a signal that you must leave the building.

In the Wolfson Building, there are several sets of Fire extinguishers on each floor, including sets near each lift and staircase. Please take note of where the nearest fire extinguishers are to the rooms you normally use.

Fire extinguishers in the Wolfson building are now in the European standard colours: they are all red! Carbon dioxide extinguishers are now identified only by a black panel, foam extinguishers by a cream label, and any remaining water extinguishers by a white label. Do not use water or foam on electrical equipment: use the CO2 extinguishers with the black label.

A.4 Escape routes

Please check that you know the **escape routes** from the buildings you use – again, *before* you actually need to use one in an emergency evacuation of the building. These are sign-posted in each building.

There are designated refuge areas for those unable to use the stairs in an emergency: on the Parks Road staircase, in the link between the north side of the Wolfson building and the e-Science building, and on the external fire-escape at the western end of the atrium. The link and atrium refuge areas are equipped with (yellow) call points.

Corridors, stairwells and exits **must not be obstructed**. Anything left in corridors, stairwells or exits will be removed. Bicycles which obstruct any of the exits or emergency exits will be removed.

A.5 Smoking

Smoking is not permitted anywhere in the Computing Laboratory's buildings. Smoke detectors linked to the fire alarm system are in operation in the Wolfson Building.

A.6 Electricity

All electrical equipment (including personal property) must be tested for safety before it is used in the Computing Laboratory buildings. Equipment must not be dismantled. If equipment is faulty, do not attempt to repair it – please fill in a Fault Report Form (available from the pigeon-holes in the Wolfson Building, or from a tray in the Thom Building Software Laboratory). Do not tamper with electrical supply equipment – please report any problems to the Laboratory's technicians.

A.7 Equipment rooms

Electrical power in the various equipment rooms (including the Software Laboratory in the Thom Building) can be cut by an 'emergency stop'. In the Thom Building, this is a white break-glass unit; in the Wolfson Building, it is a red button (either just inside or just outside the door to each equipment room); it is normally clearly labelled with a green 'Emergency stop' sign. Please note that it will usually need the support staff to restart circuits.

A.8 Lighting

Do not switch off any corridor lighting at any time. Please report any faulty corridor or staircase lighting to the technical staff. Please advise the [Administrator](#) if there are any other areas which are poorly lit.

A.9 Hazardous Waste

The waste bins are for normal office waste only, and you have a responsibility not to dispose of anything hazardous in them. In particular: please dispose of batteries in the collection box in the post room (room 157); fluorescent (low-power) bulbs should be disposed of by contacting the laboratory's technicians.

A.10 Other Safety information

A Statement of the Department's Safety Organisation, a Statement of the University Safety Policy, and a collection of University and Departmental Guidance Notes are available on the web.

The [University Safety Office](#) has a library of safety publications and other material at 10 Parks Road.

Minutes of meetings of the Departmental Safety Advisory Committee are published, and are available on the department's notice boards.

[B] People

Academic staff of the Computing Laboratory and their research interests

Professor Samson Abramsky FRS, Christopher Strachey Professor of Computing,

Room 254, Tel: 83558

Semantics of computation, game semantics, logic, and programming; High-level methods for quantum computation.

Dr Alexandru Baltag, University Lecturer in Computer Science

Room 252, Tel: 73842

Modal logic, epistemic and dynamic logic, and their applications; logic in communication; game-theoretic and decision-theoretic applications of logic; self-reference and circularity in logic and mathematics.

Professor Michael Benedikt, Professor of Computing Science

Room 355, Tel:

Database systems, web data management, finite and infinite model theory, database theory, software verification, information exchange

Professor Kevin Burrage, Professor in Computational Systems Biology

Room 313, Tel: 83568

Computational Mathematics, Computational and Systems Biology, Stochastic modelling for the Life Sciences, Multiscale modelling and simulation

Dr Ani Calinescu,

Room 317, Tel: 83527

Manufacturing complexity; information technology in manufacturing; conceptual and analytical tools to support the design, scheduling and control of manufacturing systems; the cost and value of information; distributed systems

Dr Stephen Cameron, Reader in Computing Science

Room 351, Tel: 73850

Geometric reasoning; robot programming and planning

Dr Alessandra Cavarra, University Lecturer in Software Engineering

Room 466, Tel: 83666

Model-based software engineering; Formal methods (ASMs); UML formalisation; integration of formal and semi-formal methods

Dr Stephen Clark, University Lecturer in Computer Science

Room 414, Tel: 83520

Natural Language Processing (NLP); Machine Learning for NLP; Artificial Intelligence

Dr Bob Coecke, EPSRC Advanced Research Fellow, Lecturer in Quantum Computer Science

Room 251, Tel: 73829

Mathematical foundations of quantum physics; High-level methods in quantum computer science; Ordered structures, logic and category theory; Computer science semantics

Professor Jim Davies, Professor of Software Engineering

Room 461, Tel: 73835

Model-driven architectures; e-Science; relationship between state- and event-based descriptions.

Dr Stephen Drape, Departmental Lecturer and Access/Schools Liaison Officer

Room 427, Tel: 10813

Using methods such as refinement, abstract data-types, functional programming and slicing to design and create program obfuscations

Dr Ivan Flechais, Departmental Lecturer in Software Engineering

Room 468, Tel: 83502

Computer security; secure system design; socio-organisational factors that affect secure systems, and finding ways of combining security design and this socio-organisational knowledge into a software engineering process.

Professor David Gavaghan, Professor in Computational Biology

Room 362, Tel: 10667

Mathematical modelling, numerical analysis and computation applied to problems arising in physiology, biology, chemistry and e-science.

Dr Jeremy Gibbons, University Lecturer in Software Engineering

Room 462, Tel: 83508

Theories of program derivation; program specification and transformation; algorithm design and functional programming

Dr Kathryn Gillow, Departmental Lecturer

Room 218, Tel: 73896

Adaptive finite element simulation of electrochemical problems.

Professor Georg Gottlob, Professor of Computing Science

Room 358, Tel: 83504

Web data extraction, constraint satisfaction, computational logic, data bases, data base theory, query languages, and complexity theory.

Dr Raphael Hauser, University Lecturer in Numerical Analysis

Room 213, Tel: 73864

Continuous optimization, applied probability

Dr Ralf Hinze, Reader in Software Engineering

Room 467, Tel: 10700

Functional programming, functional algorithm design, functional data structures, generic functional programming (Generic Haskell)

Professor Ian Horrocks, Professor of Computer Science

Room 304, Tel: 73939

Knowledge representation, ontologies and ontology languages, description and modal logics, automated reasoning, implementation and optimisation of reasoning systems

Professor Peter Jeavons, Professor in Computer Science

Room 354, Tel: 73853

Computational complexity theory and algebra; computational biology; constraint satisfaction problems; applications.

Dr Marina Jirotko, University Lecturer in Requirements

Room 268, Tel: 10613

Relating work place studies to the requirements, design and evaluation of technology. A main focus on eScience applications and eHealth.

Dr Geraint Jones, University Lecturer in Computation

Room 315, Tel: 73851

Design techniques that help give confidence in the correctness of hardware and of parallel programs; design by calculation.

Dr David Kay, University Lecturer in Computational Biology

Room 323, Tel: 10814

Mathematical modelling, numerical analysis and computation; Development and analysis of reliable and efficient numerical schemes for partial differential equations

Dr Stephan Kreutzer, University Lecturer in Computer Science

Room 309, Tel: 10759

Computational logic, logic and graph theory, finite model theory, graph searching games, verification and verification games, model checking, database theory

Dr Daniel Kroening, University Lecturer in Computer Science

Room 449, Tel: 83506

Formal methods for the correct construction of hardware and software systems. This includes compositional reasoning, and automated methods for checking compliance of an implementation with a specification. I am particularly interested in applying these methods to practical hard and software implementations given in languages like C or C++

Professor Marta Kwiatkowska, Professor of Computing Systems

Room 453, Tel: 83509

Modelling, analysis and verification of probabilistic and real-time systems; Quantitative verification; Model checking; Software verification; Computational biology

Dr Gavin Lowe, University Lecturer in Computer Science

Room 343, Tel: 73841

Concurrency, computer security (particularly security protocols and information flow); model checking.

Dr Andrew Martin, University Lecturer in Software Engineering

Room 460, Tel:83605

Applications of the Z notation; Z semantics; tactic language design and semantics; Ergo proof tool.

Dr Steve McKeever, University Lecturer in Software Engineering

Room 464, Tel: 83552

Automatic compiler generation; development of a declarative hardware description language, Pebble; refinement of advanced language features to core language; automation of endurance athletic coaching process.

Professor Tom Melham, Professor in Computer Science

Room 418, Tel: 73824

Applications of formal logic; mechanised reasoning, model checking and theorem proving; formal verification; digital circuit design; reconfigurable hardware; programming language semantics

Professor Oege de Moor, Professor of Computer Science

Room 005, Tel: 73878

Programming tools: compilers, IDEs, refactoring, aspect-oriented programming, meta-programming.

Dr Hanno Nickau,

Room 115, Tel: 83588

Semantics of programming languages; lambda calculus, types, proofs and categorical logic; game semantics for proofs and computation; computability and complexity theory; effectively given data structures

Dr Dan Olteanu, University Lecturer in Information Systems

Room 266, Tel: 10678

Database systems, web data management, uncertainty and inconsistency in databases

Professor Luke Ong, Professor in Computer Science

Room 340, Tel: 83522

Semantics of computation, game semantics; verification and software model checking; logic in computer science; Internet routing protocols.

Dr Joel Ouaknine, University Lecturer in Computer Science

Room 409, Tel: 73822

Modelling, analysis, and verification of real-time and hybrid systems; Software model checking; Concurrency; Probabilistic systems; Theorem proving

Dr Vasile Palade,

Room 322, Tel: 83606

Hybrid intelligent systems, neural networks, genetic algorithms, fuzzy systems, multi-agent systems, rule extraction, applications of intelligent techniques in control and diagnosis.

Professor Stephen Pulman FBA, Professor of Computational Linguistics

Room 405, Tel: 10800

Research interests: formal and computational semantics for natural language; automated reasoning and language; combining statistical and symbolic models of language

Professor Bill Roscoe, Professor of Computing Science

Room 256, Tel: 73859

Concurrency; semantics; VLSI; distributed databases; formal methods in hardware design; domain theory.

Dr Andrew Simpson, University Lecturer in Software Engineering

Room 463, Tel: 83514

Modelling and analysis of critical systems, database design and security for e-science applications.

Dr Nic Smith, University Lecturer in Computational Biology

Room 363, Tel: 10669

Computational and multi-scale modelling of the heart, cardiac fluid dynamics, excitation-contraction coupling

Dr Ian Sobey, University Lecturer in Numerical Analysis

Room 215, Tel: 73894

Computational and theoretical fluid mechanics.

Dr Michael Spivey, University Lecturer in Computation

Room 314, Tel: 73854

Applications of discrete mathematics to the design of software and hardware systems; compilation of programs into hardware designs.

Mr Bernard Sufryn, University Lecturer in Computation

Room 312, Tel: 73828

Machine-supported proof and the teaching of logic; formal methods in system design; programming language design and implementation; the human-machine interface.

Professor Endre Süli, Professor of Numerical Analysis

Room 229, Tel: 73880

Error analysis of discretisation methods for partial differential equations: finite element and finite volume methods.

Professor Nick Trefethen FRS, Professor of Numerical Analysis

Room 206, Tel: 73886

Numerical analysis; applied mathematics; eigenvalue problems.

Dr Niki Trigoni, University Lecturer in Software Engineering

Room 469, Tel: 10681

Distributed data management in sensor networks: query processing, storage management, routing and MAC layers

Dr Irina Voiculescu, Departmental Lecturer

Room 114, Tel: 83501

Geometric modelling; constructive solid geometry; interval arithmetic; multivariate Bernstein-base polynomial forms.

Dr Andy Wathen, Reader in Numerical Analysis

Room 210, Tel: 73887

Numerical analysis of methods for partial differential equations; numerical linear algebra; some applications in biology.

Dr Jonathan Whiteley, University Lecturer in Computational Biology

Room 330, Tel: 73858

Mathematical modelling, numerical analysis and computation applied to problems in physiology and biology.

Dr James Worrell, University Lecturer in Computer Science

Room 416, Tel: 73843

Modelling and verification of infinite-state systems, including real-time and probabilistic systems. Semantics of computation.

Teaching Assistant

Mr James Whitehead

Room 007, Tel: 83549

Support staff of the Computing Laboratory

<i>Room</i>	<i>Telephone</i>	<i>Name</i>	<i>Position</i>
107	73863	Christine O'Connor	Academic Administrator
104	73833	Leanne Carveth	Deputy Academic Administrator
112	83559	Wendy Adams	Secretary / Academic Administration
106	83601	Jo Leggett	PA to the Administrator / Academic Administration
106	83585	Brenda Deeley	Administrative Staff Secretary / Academic Administration
112	73817	Julie Sheppard	Graduate Studies Secretary
154	73838	Shirley Dickson	Receptionist
149	73827	Malcolm Harper	Computer Manager
148	83567	Craig Tranfield support@comlab	Operations Manager Computer Support Team
105	73831	Mike Field	Departmental Administrator
107	73898	Katie Dicks	Finance Officer

[C] Departmental Groups

Computer Science

Research in Computer Science at Oxford began with the *Programming Research Group* (PRG). The PRG obtained its early reputation for its pioneering research on programming languages, concentrating on their logical foundations including Scott-Strachey denotational semantics, for its development of the CSP approach to concurrent processes, and for the Z specification language and algebraic theories of programming. Other research (often in collaboration with other organisations) has developed the occam language, methods to ensure the correct production of software and hardware, the functional programming language Orwell, and the 2OBJ and Jape logical frameworks for theorem proving, hardware compilers and optimisers, and game-theoretic models of higher-order programming.

Today, Computer Science research at the Laboratory continues in the spirit established by the PRG. Many of its research projects rely on a close interaction of mathematical theories with their experimental validation and evaluation. Others involve methods from other disciplines, such as the social sciences. All aim to achieve a high degree of intellectual rigour.

On the experimental side of Computer Science, the Laboratory has a long-established policy of subjecting its theories to practical tests. Early tests are often conducted as student projects; they range from significant case studies on paper to prototype implementations designed to answer specific questions of feasibility, to explore the range of application and to evaluate acceptability of interfaces. In many cases a project has been set up under the sponsorship of local industry or of another department of the University and the delivered programs have been of recognised benefit to their sponsors.

One important characteristic of the Laboratory is the spirit of free interchange among its members working on different theories or on different applications. Problems of practical importance are often solved with the assistance of a theorist—or perhaps such problems reveal a gap or deficiency in the theory and the remedy leads to a yet more elegant and comprehensive theory. It continues to vindicate the wisdom of Christopher Strachey's remarks.

The Laboratory has more than fifty research partners throughout the world. One project, with INMOS Ltd., won the Queen's Award for Technological Achievement in 1990; a second Queen's Award was gained in 1992 on the basis of the Laboratory's long-term collaboration with IBM UK Ltd on the re-engineering of its CICS transaction processing system.

The Numerical Analysis Group

Numerical Analysis concerns the development of algorithms for solving all kinds of problems of continuous mathematics; thus it is a wide-ranging discipline having close connections with engineering, computer science, other sciences, and of course mathematics itself. The best algorithms in this field should be accurate, robust, and fast. Achieving these goals depends on a blend of algorithmic and mathematical creativity, rigorous error analysis, and a thorough knowledge of areas of application. Individual research projects range from production of software at the applied end to

proofs of theorems in error analysis at the theoretical end, with plenty of mathematics, numerical experimentation, and study of application areas in-between.

In its early years the Numerical Analysis Group directed its efforts towards establishing numerical analysis as a coherent discipline, training many of the young people who then went on to introduce the subject in other universities in the UK. Research was concentrated on algebraic problems, especially numerical linear algebra, and on finite difference methods for ordinary and partial differential equations and integral equations. Great importance was attached to working with the Oxford Study Groups on problems arising from industrial applications, and the University Consortium for Industrial Numerical Analysis (UCINA) was set up in 1979.

The 1980s and early 1990s saw a greater emphasis on the development of finite element and finite volume methods for a wide range of partial differential equations. This brought with it increased use of the methods of functional analysis and the theory of differential equations. Applications of the methods concentrated on problems of fluid flow, and the Institute for Computational Fluid Dynamics (ICFD) played an important part in the development of the Group and its research.

Today the Numerical Analysis group is broader than ever, being active in research across most of the areas of numerical analysis and scientific computing. Particular strengths include numerical solution of partial differential equations, computational fluid dynamics, iterative methods in numerical linear algebra, analysis of finite element, finite volume and spectral discretisations, stability analysis, approximation theory, high-performance scientific computing, eigenvalue problems, Markov chains, numerical conformal mapping, and applications in medicine, fluid mechanics, electromagnetics, and biology. The group maintains strong links with Oxford's engineering, mathematics and applied mathematics groups and with academic and industrial partners around Britain and abroad.

[D] Applying for Computer Resources

The Laboratory network connects around 70 servers, several hundred workstations (mostly Linux but also dual boot with Windows XP), various supercomputers, and many other machines. Facilities elsewhere are accessed via fast connections to the Internet. Details of the facilities available on the network may be obtained from any of the Laboratory's Computing Officers or on the web at

<http://www.comlab.ox.ac.uk/internal/comp-net.html>

The University has formal regulations and a code of conduct which govern the use and misuse of Computers and Networks. In addition to this, members of the Computing Laboratory are expected as a matter of honour to respect the privacy of other users of the networks to which they have access, and to refrain from actions which will cause others' work to be damaged or delayed. Any member of the Laboratory seeking to explore the letter, rather than the spirit, of the University regulations would be well advised to consult the Director of Graduate Studies beforehand.

For an account on the Laboratory's own network you should complete the Application for Computer Resources form included in your induction pack, and bring it to the first practical class. If this is not possible, please consult the Operations Manager, Craig Tranfield, Room 148 (tel. no.: 83567).

If you experience difficulties in using any of the machines or networks, please send electronic mail to support@comlab

The following notes are to help you to complete your Application for Computer Resources.

The Data Protection Act

The Data Protection Act 1998 defines "personal data" as data which "relate to a living individual who can be identified- (a) from those data, or (b) from those data and other information which is in the possession of, or is likely to come into the possession of, the data controller, and includes any expression of opinion about the individual and any indication of the intentions of the data controller or any other person in respect of the individual;"

The University has issued a statement on its Data Protection Policy, and you are requested to read and take note of this; a copy is appended. By signing the application form you are agreeing that you will not misuse personal data. If you are in any doubt about this, or other aspects of data protection, you should contact the support staff.

Other Notes

These notes are to help you to interpret the Application for Computer Resources form. If you need any additional help or information, please contact the support staff at the Computing Laboratory, Wolfson Building, Parks Road, support@comlab.ox.ac.uk

Nobody may use the resources of the Computing Laboratory without signing an application form, nor continue to do so once their account has expired.

Queries about the conditions imposed by particular software licence agreements should be addressed to the support staff.

Heads of University departments issue rules and regulations which apply to all whose use facilities in their departments. The use of Computing Laboratory facilities based in the Thom Building is governed by the rules of the Department of Engineering Science (as they apply to the Thom Building) and by the rules of the Computing Laboratory (as they apply to use of practical facilities). You must comply with any such rules which are brought to your attention. The University has issued a policy on data protection and computer misuse which you should read and take note of, copy attached. **By signing the application form you are agreeing that you will not misuse any of the resources.**

Referenced documents are available at or based upon:

<http://www.ox.ac.uk/it/rules/proctors.html>
(Computer Misuse & Data Protection)

<http://www.ox.ac.uk/it/rules/rules.html>
(Computer Use)

<http://www.hmsso.gov.uk/acts/acts1984/1984035.htm>
(Data Protection Act 1984)

<http://www.hmsso.gov.uk/acts/acts1998/19980029.htm>
(Data Protection Act 1998)

Returning the application form

Please bring the completed form to one of the practical classes arranged for your course during first week. You should hand it to one of the Departmental Lecturers in exchange for an envelope containing details of your username and password.

Declaration

This is a copy of the declaration which each student who requires computing facilities is asked by the Computing Laboratory to sign

I accept that all software systems and software packages used by me are to be regarded as covered by software licence agreement, with which I agree to abide, which unless specifically stating otherwise will prohibit me from making copies of the software or transferring copies of the software to anyone else, other than for security purposes, or from using the software or any of its components as the basis of a commercial product or in any other way for commercial gain. I indemnify the Chancellor, Masters and Scholars of the University of Oxford, and the Oxford University Computing Laboratory, for any liability resulting from my breach of any such software licence agreement.

I will not use personal data as defined by the Data Protection Act on computing facilities made available to me in respect of this application other than in the course of my work as per the University's registration. I accept that the Oxford University Computing Laboratory reserve the right to examine material on or connected to any of their facilities when it becomes necessary for the proper conduct of those facilities or to meet legal requirements and to dispose of any material associated with this application for access to its resources upon termination or expiry of that authorisation.

I agree to abide by any code of conduct relating to the systems I use and the University policy on data protection and computer misuse. In particular, I will not (by any wilful or deliberate act) jeopardise or corrupt, or attempt to jeopardise or corrupt, the integrity of the computing equipment, its system programs or other stored information, nor act in any way which leads to or could be expected to lead to the disruption of the approved work of other authorised users.

[E] Student and Supervisor Responsibilities

UNIVERSITY OF OXFORD

MEMORANDUM OF GUIDANCE FOR RESEARCH STUDENTS AND THEIR SUPERVISORS

[This is an extract from the *Examination Regulations 2008*, pp. 850-853. If this note should differ from the *Examination Regulations* in any respect then the *Examination Regulations* take precedence.]

Responsibilities of the student

1. The student must accept his or her obligation to act as a responsible member of the University's academic community.
2. The student should take ultimate responsibility for his or her research programme and endeavour to develop an appropriate working pattern, including an agreed and professional relationship with the supervisor(s). The student should discuss with the supervisor the type of guidance and comment which he or she finds most helpful, and agree a schedule of meetings.
3. He or she should make appropriate use of the teaching and learning facilities available within the University.
4. It is the student's responsibility to seek out and follow the regulations relevant to his or her course, including faculty/departmental handbooks/notes of guidance, and to seek clarification from supervisors and elsewhere if this is necessary.
5. The student should not hesitate to take the initiative in raising problems or difficulties, however elementary they may seem. He or she should ensure that any problems regarding the project are drawn to the attention of the supervisor so that appropriate guidance may be offered.
6. The student should seek to maintain progress in accordance with the plan of work agreed with the supervisor, including in particular the presentation of the required written material in sufficient time for comment and discussion before proceeding to the next stage. As groundwork for the thesis, the student should as soon as possible write rough drafts of possible chapters. Students in the sciences should keep a systematic record of all that has been attempted and accomplished. Both the student and the supervisor will want to keep a record of all formal, scheduled meetings. They may well want to agree a record of what has been discussed and decided.
7. The student should recognise that a supervisor may have many competing demands on his or her time. The student should hand in work in good time to the supervisor and give adequate notice of unscheduled meetings. The need for adequate notice also applies to requests for references from the supervisor.
8. The student should be aware that the provision of constructive criticism is central to a satisfactory supervisory relationship, and should always seek a full assessment of the strengths and weaknesses of his or her work.
9. If the student feels that there are good enough grounds for contemplating a change of supervision arrangements, this should first be discussed with the supervisor or, if this seems difficult, with the appropriate head of department, director of graduate studies or their deputies, or the college advisor.

10. Where problems arise, it is essential that a student gives full weight to any guidance and corrective action proposed by the supervisor.
11. The student should provide regular reports on his or her progress to the board in accordance with any requirements of the Educational Policy and Standards Committee. The student must satisfy the supervisor on his or her progress at least once a year and should inform the supervisor at once of any circumstances that might require his or her mode of study to be modified or his or her registration as a graduate student to be extended, suspended or withdrawn.
12. The student should ensure that the standard of his or her English is sufficient for the presentation of a thesis. Students whose first language is not English should take advice on this.
13. The student should make full use of the facilities for career guidance and development, and should consult their supervisor for advice and encouragement where appropriate.
14. The student should ensure that he or she allows adequate time for writing up the thesis, taking the advice of the supervisor. Particular attention should be paid to final proof-reading.
15. It is the student's responsibility to decide when he or she wishes to submit the thesis for examination, after taking due account of the supervisor's opinion, though this is only advisory. It is in the student's interests to ensure that the final version has been made available to the supervisor in good time before the intended date of submission.

Responsibilities of the supervisor

1. In considering an invitation to supervise a research student, the supervisor must recognise and accept the responsibilities both to the student and to the relevant board or committee implicit in the supervisory relationship.
2. Where practicable, the supervisor should assign the student some directed reading before arrival. This might be of a general background nature so as to put the student in a position to discuss the topic with the supervisor soon after arrival, or it might form the start of a survey of current literature. The supervisor is required to meet with the new student not later than the second week of Full Term.
3. The supervisor is responsible for giving early advice about the nature of research and the standard expected, and about the planning of the research programme. The supervisor should ensure that, where the student's research forms part of a funded research programme, sufficient financial support will be available for the duration of the student's period of study; if there is any doubt, he or she should agree with the student an alternative fallback project at an early stage. The supervisor is also responsible for advising the student about literature and sources, attendance at classes, and requisite techniques (including helping to arrange instruction where necessary). The supervisor should discuss with the student the lecture list for his or her subject and related lecture lists. The supervisor should identify with the student any subject specific skills necessary for the proposed research.
4. Where during his or her first year of research a student wishes, in addition to contact with his or her supervisor(s), to have limited consultation with one or two other academics the supervisor should try to identify (in conjunction with the Director of Graduate Studies) such colleagues and to arrange for an approach to them by the student.
5. Where a supervisor operates as a co-supervisor or as a part of a supervisory team, it is important to clarify the responsibilities of each supervisor and to coordinate advice and guidance.

6. Where the thesis is likely to involve statistical analysis or tabulation of numerical results, the supervisor should arrange for the student to obtain advice, *at an early stage*, about the design of any experiment or the collection and storage; of data, and about its subsequent analysis.
7. The supervisor should ensure that the student works within a planned framework which marks out the stages which the student should be expected to have completed at various points in his or her period of study. The nature of the framework will of course vary widely from subject to subject, but in all subjects the formulation of the topic, planning and management of time should begin at an early stage. Particular attention should be given to the selection and refinement of the research topic, which in the case of the D.Phil. should be one which a diligent student may reasonably be expected to complete within three (or at most four) years of full-time study.
8. The supervisor should meet with the student regularly. Supervisor and student should agree a formal schedule of meetings on a termly or annual basis. The supervisor should also be accessible to the student at other appropriate times when advice is needed. The supervisor should also request written work as appropriate and in accordance with the plan discussed with the student. Such work should be returned with constructive criticism and in reasonable time.
9. The supervisor should tell the student from time to time how well, in the supervisor's opinion, work is getting on, and try to ensure that the student feels properly directed and able to communicate with the supervisor. It is essential that when problems arise, corrective action is clearly identified and full guidance and assistance are given to the student.
10. The supervisor is required to report to the board on the student's work three times a year, once at the end of each term. Each report should state the nature and extent of recent contact with the student, and, if there has been none, state why this is so. The report should also make clear whether the student is making satisfactory progress, bearing in mind that a D.Phil. thesis should normally be completed within three (or at most four) years of full-time research. Any student who has not satisfied his or her supervisor on at least one occasion in an academic year that he or she is making progress will be liable to have his or her name removed from the register.
11. The supervisor should aim to ensure that by the end of the first year the topic or goal of the student's research is clearly defined, that the student has the necessary background knowledge, and that the required resources are available. The supervisor must have ascertained by then that the student can write a coherent account of his or her work in good English.
12. The supervisor should try to ensure that unnecessary delays do not occur. These have been known to arise, for example, for reasons such as:
 - (a) insufficient effort at the outset in choosing and formulating the research topic;
 - (b) a slow start because of the time taken to adjust to research work;
 - (c) distractions from the main line of inquiry;
 - (d) superfluous attempts to tie up every loose end;
 - (e) (and mainly in the sciences)
 - (f) inadequate and delayed planning and assembly of apparatus and equipment;
 - (g) insufficient collection or recording of data at an early stage, so that work has to be repeated in the later stages.
13. The supervisor should arrange for students to have the opportunity to discuss their research with other staff and students in their subject area (see also (4) above) and

to communicate to others in the wider academic community, both orally and in writing, his or her research findings.

14. Where a student undertakes research as part of a team or group the supervisor should ensure that this is in full awareness of the way in which the student's own contribution fits into the work of the remainder of the group.
15. The supervisor should not be absent on leave unless he or she has ensured that appropriate temporary supervision has been arranged for the student.

Responsibilities of departments

1. Departments should provide information about:
 - (a) any induction provided on a departmental, divisional or University basis;
 - (b) welfare arrangements within the University, e.g. the Counselling Service, Student Hardship and Access funds, the provisions for support offered by the Proctors and the Assessor.
 - (c) any general transferable skills from which the student is likely to profit during the course of his or her research, and the available provision at departmental, divisional and university level;
2. Departments should ensure that there is appropriate monitoring of a student's work and progress and that reports are submitted on a termly basis in accordance with the University's requirements.
3. Departments should endeavour to provide opportunities for a student to:
 - (a) defend his or her findings to appropriate research seminars and respond to potentially critical questioning;
 - (b) at an appropriate stage to present his or her findings to national, and if appropriate, international conferences;
4. *Departments should*
 - (a) help the student to present work in a clear and professional manner;
 - (b) help the student to develop his or her communication skills, especially for different audiences;
 - (c) provide some guidance in oral examination techniques.

Safety and Health

Supervisors of all students, whether in the arts or in the sciences, should consider carefully the safety implications of their students' research. Those supervising students (particularly those in the sciences) are responsible for all aspects of safety under their control, and in particular for the safe conduct of all experiments carried out in the course of their students' research. In the event of an accident, inadequate supervision may render the supervisor liable to prosecution. Supervisors should also ensure that their students are made aware that in the event of injury to other persons as a result of their negligence, the student could be subject to civil claims for damages. Advice on the legal responsibilities for safety may be obtained from the University Safety Officer. For their part, *students* must carry out research with proper regard to good health and safety practices. Supervisors and students should be aware of the need for adequate health insurance and health precautions when travelling abroad. In case of doubt, reference should be made to the University Occupational Physician.

[F] Regulations Relating to the Use of Information Technology Facilities

ICTC Regulations 1 of 2002

REGULATIONS RELATING TO THE USE OF INFORMATION TECHNOLOGY FACILITIES

Made by the ICTC on 6 June 2002

Approved by Council on 24 July 2002

Amended 2nd October 2003, 23rd October 2003, 16th February, 2006 and 1st June, 2006

1. In these regulations, unless the context requires otherwise, 'college' means any college, society, or Permanent Private Hall or any other institution designated by Council by regulation as being permitted to present candidates for matriculation.
2. University IT and network facilities are provided for use in accordance with the following policy set by Council:
 - 2.1 The University provides computer facilities and access to its computer networks only for purposes directly connected with the work of the University and the colleges and with the normal academic activities of their members.
 - 2.2. Individuals have no right to use university facilities for any other purpose.
 - 2.3. The University reserves the right to exercise control over all activities employing its computer facilities, including examining the content of users' data, such as e-mail, where that is necessary:
 - (a) for the proper regulation of the University's facilities;
 - (b) in connection with properly authorised investigations in relation to breaches or alleged breaches of provisions in the University's statutes and regulations, including these regulations; or
 - (c) to meet legal requirements.
 - 2.4. Such action will be undertaken only in accordance with these regulations.
3. These regulations govern all use of university IT and network facilities, whether accessed by university property or otherwise.
4. Use is subject at all times to such monitoring as may be necessary for the proper management of the network, or as may be specifically authorised in accordance with these regulations.
5. 1. Persons may make use of university facilities only with proper authorisation.
 - 5.2. 'Proper authorisation' in this context means prior authorisation by the appropriate officer, who shall be the Director of Oxford University Computing Services ('OUCS') or his or her nominated deputy in the case of services under the supervision of OUCS, or the nominated college or departmental officer in the case of services provided by a college or department.
 - 5.3. Any authorisation is subject to compliance with the University's statutes and regulations, including these regulations, and will be considered to be terminated by any breach or attempted breach of these regulations.
6. 1. Authorisation will be specific to an individual.

6.2. Any password, authorisation code, etc. given to a user will be for his or her use only, and must be kept secure and not disclosed to or used by any other person.

7. Users are not permitted to use university IT or network facilities for any of the following:

7.1. any unlawful activity;

7.2. the creation, transmission, storage, downloading, or display of any offensive, obscene, indecent, or menacing images, data, or other material, or any data capable of being resolved into such images or material, except in the case of the use of the facilities for properly supervised research purposes when that use is lawful and when the user has obtained prior written authority for the particular activity from the head of his or her department or the chairman of his or her faculty board (or, if the user is the head of a department or the chairman of a faculty board, from the head of his or her division);

7.3. the creation, transmission, or display of material which is designed or likely to harass another person in breach of the University's Code of Practice on Harassment;

7.4. the creation or transmission of defamatory material about any individual or organisation;

7.5. the sending of any e-mail that does not correctly identify the sender of that e-mail or attempts to disguise the identity of the computer from which it was sent;

7.6. the sending of any message appearing to originate from another person, or otherwise attempting to impersonate another person;

7.7. the transmission, without proper authorisation, of e-mail to a large number of recipients, unless those recipients have indicated an interest in receiving such e-mail, or the sending or forwarding of e-mail which is intended to encourage the propagation of copies of itself;

7.8. the creation or transmission of or access to material in such a way as to infringe a copyright, moral right, trade mark, or other intellectual property right;

7.9. private profit, except to the extent authorised under the user's conditions of employment or other agreement with the University or a college; or commercial purposes without specific authorisation;

7.10. gaining or attempting to gain unauthorised access to any facility or service within or outside the University, or making any attempt to disrupt or impair such a service;

7.11. the deliberate or reckless undertaking of activities such as may result in any of the following:

(a) the waste of staff effort or network resources, including time on any system accessible via the university network;

(b) the corruption or disruption of other users' data;

(c) the violation of the privacy of other users;

(d) the disruption of the work of other users;

(e) the introduction or transmission of a virus into the network;

12. activities not directly connected with employment, study, or research in the University or the colleges (excluding reasonable and limited use for social and recreational purposes where not in breach of these regulations or otherwise forbidden) without proper authorisation.

8. Software and computer-readable datasets made available on the university network may be used only subject to the relevant licensing conditions, and, where applicable, to the Code of Conduct published by the Combined Higher Education Software Team ('CHEST').

9. Users shall treat as confidential any information which may become available to them through the use of such facilities and which is not clearly intended for unrestricted dissemination; such information shall not be copied, modified, disseminated, or used either in whole or in part without the permission of the person or body entitled to give it.

10. 1. No user may use IT facilities to hold or process data relating to a living individual save in accordance with the provisions of current data protection legislation (which in most cases will require the prior consent of the individual or individuals whose data are to be processed).

10.2. Any person wishing to use IT facilities for such processing is required to inform the University Data Protection Officer in advance and to comply with any guidance given concerning the manner in which the processing may be carried out.

11. Any person responsible for the administration of any university or college computer or network system, or otherwise having access to data on such a system, shall comply with the provisions of the 'Statement of IT Security and Privacy Policy', as published by the ICT Committee from time to time.

12. Users shall at all times endeavour to comply with guidance issued from time to time by OUCS to assist with the management and efficient use of the network.

13. Connection of computers, whether college, departmental, or privately owned, to the university network is subject to the following additional conditions:

(1a) Computers connected to the university network may use only network identifiers which follow the

University's naming convention, and are registered with OUCS.

(b) In particular all such names must be within the domain .ox.ac.uk.

(c) Any exception to this must be authorised by the Director of OUCS, and may be subject to payment of a licence fee.

(2a) Owners and administrators of computers connected to the university network are responsible for ensuring their security against unauthorised access, participation in 'denial of service' attacks, etc. In particular they are responsible for ensuring that anti-virus software is installed and regularly updated, and that rules and guidelines on security and anti-virus policy, as issued from time to time by the ICTC, are followed.

(b) The University may temporarily bar access to any computer or sub-network that appears to pose a danger to the security or integrity of any system or network, either within or outside Oxford, or which, through a security breach, may bring disrepute to the University.

(3a) Providers of any service must take all reasonable steps to ensure that that service does not cause an excessive amount of traffic on the University's internal network or its external network links.

(b) The University may bar access at any time to computers which appear to cause unreasonable consumption of network resources.

(4a) Hosting Web pages on computers connected to the university network is permitted subject to the knowledge and consent of the department or college responsible for the local resources, but providers of any such Web pages must endeavour to comply with guidelines published by OUCS or other relevant authorities.

(b) It is not permitted to offer commercial services through Web pages supported through the university network, or to provide 'home-page' facilities for any commercial organisation, except with the permission of the Director of OUCS; this permission may require the payment of a licence fee.

(5) Participation in distributed file-sharing networks is not permitted, except in the case of the use of the facilities for properly authorised academic purposes when that use is lawful and when the user:

(a) in the case of services under the supervision of OUCS, has demonstrated to the satisfaction of the Director of OUCS or his or her nominated deputy that the user has obtained prior written authority for the particular activity from the head of his or her department or the chairman of his or her faculty board; or

(b) in the case of services provided by a college or department, has demonstrated to the satisfaction of the nominated college or departmental officer that the user has obtained prior written authority for the particular activity from the head of that college or department.

(6a) No computer connected to the university network may be used to give any person who is not a member or employee of the University or its colleges access to any network services outside the department or college where that computer is situated.

(b) Certain exceptions may be made, for example, for members of other UK universities, official visitors to a department or college, or those paying a licence fee.

(c) Areas of doubt should be discussed with the Registration Manager at OUCS.

(7) Providing external access to University network resources for use as part of any shared activity or project is permitted only if authorised by the ICTC, and will be subject to any conditions that the ICTC may specify.

(8) If any computer connected to the network or a sub-network does not comply with the requirements of this section, it may be disconnected immediately by the Network Administrator or any other member of staff duly authorised by the head of the college, section or department concerned.

14a If a user is thought to be in breach of any of the University's statutes or regulations, including these regulations, he or she shall be reported to the appropriate officer who may recommend to the appropriate university or college authority that proceedings be instituted under either or both of university and college disciplinary procedures.

(b) Access to facilities may be withdrawn under section 42 of Statute XI pending a determination, or may be made subject to such conditions as the Proctors or the Registrar (as the case may be) shall think proper in the circumstances.

Examining Users' Data

15. All staff of an IT facility who are given privileged access to information available through that facility must respect the privacy and security of any information, not clearly intended for unrestricted dissemination, that becomes known to them by any means, deliberate or accidental.

16 1. System Administrators (i.e. those responsible for the management, operation, or maintenance of computer systems) have the right to access users' files and examine network traffic, but only if necessary in pursuit of their role as System Administrators.

16.2. They must endeavour to avoid specifically examining the contents of users' files without proper authorisation.

17 1. If it is necessary for a System Administrator to inspect the contents of a user's files, the procedure set out in paragraphs (2)-(5) below must be followed.

17.2. Normally, the user's permission should be sought.

17.3. Should such access be necessary without seeking the user's permission, it should, wherever possible, be approved by an appropriate authority prior to inspection.

17.4. If it has not been possible to obtain prior permission, any access should be reported to the user or to an appropriate authority as soon as possible.

17.5. For the purposes of these regulations 'appropriate authority' is defined as follows:

(a) in the case of any university-owned system, whether central or departmental: if the files belong to a student member, the Proctors; if the files belong to any member of the University other than a student member, the Registrar or his or her nominee; or, if the files belong to an employee who is not a member of the University, the head of the department, college, or other unit to which the employee is responsible, or the head's delegated representative;

(b) in the case of a departmental system, either those named in (a) above, or, in all circumstances, the head of department or his or her delegated representative;

(c) in the case of a college system, the head of the college or his or her delegated representative.

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[G] University Policy on Intellectual Property

The University of Oxford has in place arrangements governing the ownership and exploitation of intellectual property generated by students and researchers in the course of, or incidental to, their studies. These arrangements are set out in the University's *Statutes* 2000 (page 121 refers) under which the University claims ownership of certain forms of intellectual property which students may create. A full version of policy can be found at:

<http://www.admin.ox.ac.uk/statutes/790-121.shtml# Toc28143157>

The main provisions in the *Statutes* are as follows.

PART B: INTELLECTUAL PROPERTY

5. (1) The University claims ownership of all intellectual property specified in section 6 of this statute which is devised, made, or created:

- (a) by persons employed by the University in the course of their employment;
- (b) by student members in the course of or incidentally to their studies;
- (c) by other persons engaged in study or research in the University who, as a condition of their being granted access to the University's premises or facilities, have agreed in writing that this Part shall apply to them; and
- (d) by persons engaged by the University under contracts for services during the course of or incidentally to that engagement.

(2) The University's rights under sub-section (1) above in relation to any particular piece of intellectual property may be waived or modified by agreement in writing with the person concerned.

6. The intellectual property of which ownership is claimed under section 5 (1) of this statute comprises:

- (1) works generated by computer hardware or software owned or operated by the University;
- (2) films, videos, multimedia works, typographical arrangements, field and laboratory notebooks, and other works created with the aid of university facilities;
- (3) patentable and non-patentable inventions;
- (4) registered and unregistered designs, plant varieties, and topographies;

(5) university-commissioned works not within (1), (2), (3), or (4);

(6) databases, computer software, firmware, courseware, and related material not within (1), (2), (3), (4), or (5), but only if they may reasonably be considered to possess commercial potential; and

(7) know-how and information associated with the above.

7. Notwithstanding section 6 of this statute, the University will not assert any claim to the ownership of copyright in:

(1) artistic works, books, articles, plays, lyrics, scores, or lectures, apart from those specifically commissioned by the University;

(2) audio or visual aids to the giving of lectures; or

(3) computer-related works other than those specified in section 6 of this statute.

8. For the purpose of sections 6 and 7 of this statute, 'commissioned works' are works which the University has specifically employed or requested the person concerned to produce, whether in return for special payment or not, but, save as may be separately agreed between the University Press and the person concerned, works commissioned by the University Press in the course of its publishing business shall not be regarded as 'works commissioned by the University'.

9. Council may make regulations:

(1) defining the classes of persons or naming individuals to whom section 5 (1) (c) of this statute shall apply;

(2) requiring student members and such other persons as may be specified in regulations to sign any documents necessary in order to give effect to the claim made by the University in this Part and to waive any rights in respect of the subject-matter of the claim which may be conferred on them by Chapter IV of Part 1 of the Copyright, Designs and Patents Act 1988; and

(3) generally for the purposes of this Part.

10. This Part shall apply to all intellectual property devised, made, or created on or after 1 October 2000 and is subject to the provisions of the Patents Act 1977.

[H] University Policy on Data Protection and Computer Misuse

Data Protection Policy

The primary purpose of current data protection legislation is to protect individuals against possible misuse of information about them held by others. It is the policy of the University to ensure that all members of the University and its staff are aware of the requirements of data protection legislation under their individual responsibilities in this connection.

The Act covers personal data, whether held on computer or in certain manual files.

The University is obliged to abide by the data protection principles embodied in the Act. These principles require that personal data shall:

- be processed fairly and lawfully;
- be held only for specified purposes and not used or disclosed in any way incompatible with those purposes;
- be adequate, relevant and not excessive;
- be accurate and kept up-to-date;
- not be kept for longer than necessary for the particular purpose;
- be processed in accordance with data subject's rights;
- be kept secure;
- not be transferred outside the European Economic Area unless the recipient country ensures an adequate level of protection.

Definitions and guidance on what constitutes fair and lawful processing (principle 1) may be found at <http://www.admin.ox.ac.uk/councilsec/dp/defs.shtml>

The Act provides individuals with rights in connection with personal data held about them. It provides individuals with the right to access data concerning themselves (subject to the rights of third parties). It also includes the right to seek compensation through the courts for damages and distress suffered by reason of inaccuracy or the unauthorised destruction or wrongful disclosure of data. Information on how to make a request for access to personal data under the Act may be obtained from data.protection@admin.ox.ac.uk.

Under the terms of the Act, processing of data includes any activity to do with the data involved. All staff or other individuals who have access to, or who use, personal data, have a responsibility to exercise care in the treatment of that data and to ensure that such information is not disclosed to any unauthorised person. Examples of data include address lists and contact details as well as individual files. Any processing of such information must be done in accordance with the principles outlined above. In order to comply with the first principle (fair and lawful processing), at least one of the following conditions must be met:

- the individual has given his or her consent to the processing;

- the processing is necessary for the performance of a contract with the individual;
- processing is required under a legal obligation;
- processing is necessary to protect the vital interests of the individual;
- processing is necessary to carry out public functions;
- processing is necessary in order to pursue the legitimate interests of the controller or third parties (unless it could prejudice the interests of the individual).

In the case of [sensitive personal data](#), which includes information about racial or ethnic origins; political beliefs; religious or other beliefs; trade union membership; health; sex life; criminal allegations, proceedings or convictions, there are additional restrictions and explicit consent will normally be required.

In relation to security (Principle 7), the Data Controller (the University) must take appropriate technical and organisational measures against unauthorised or unlawful processing of personal data and against accidental loss or destruction of or damage to personal data and sets out specific considerations for ensuring security. Staff and other individuals should be aware that guidelines and regulations relating to the security of manual filing systems and the preservation of secure passwords for access to relevant data held on computer should be strictly observed.

Staff should also note that personal data should not normally be provided to parties external to the University. Special arrangements apply to the exchange of data between the University and the colleges. For further guidance on this, please contact data.protection@admin.ox.ac.uk.

Under principle 8, which restricts the transfer of material outside the European Area, personal data about an individual placed on the world wide web is likely to breach the provisions of the Act unless the individual whose data is used has given his or her express consent. It is important that all those preparing web pages, address lists and the like, are aware of these provisions, and seek advice from the Data Protection Officer if in doubt.

The Act specifies arrangements for the notification of processing undertaken by the Institution. The University has a wide ranging notification under the 1998 Act, which can be [accessed online](#). Any members of staff who are uncertain as to whether their activities or proposed activities are included in the University's notification should contact the Data Protection Officer in the first instance.

A failure to comply with the provisions of the Act may render the University, or in certain circumstances the individuals involved, liable to prosecution as well as giving rise to civil liabilities. Individuals are encouraged to familiarise themselves with the general aspects of Data Protection contained in the University's guidelines to the Act, referred to above and with any specific measurements recommended by the University or their Department relevant to the particular nature of their work. Further information and advice may be obtained from Departmental Data Protection Representatives or from the University's Data Protection Officer – please send enquiries to: data.protection@admin.ox.ac.uk

Computer Use and Misuse

The University regards computer misuse as a serious matter which may warrant disciplinary action.

A policy statement, rules and guidelines on the use of the University's IT facilities are published by the ICT Committee with the approval of Council. They appear in the Proctors' and Assessor's Memorandum, and may also be found at

<http://www.ict.ox.ac.uk/oxford/rules/>

[I] Use of Computing Laboratory Equipment and Premises

These are the formal conditions under which use may be made of OUCL equipment in the Computing Laboratory and on level six of the Thom Building. Users *must* abide by the rules; anyone wishing to use the facilities of the Computing Laboratory must sign a declaration to do so.

Copies of the rules are displayed in Computing Laboratory buildings and in the Practicals Laboratory on level six of the Thom Building.

Definitions

In these rules, ‘users’ are staff or students of the University who have been given accounts on the Computing Laboratory workstation network. The authorisation permits those involved to use the facilities of OUCL only for the subject of their course. Authorisation lapses on the completion of that course. A ‘remote terminal’ is any device that may be used to make a connection with the network. Any reference to equipment is assumed to include any Computing Laboratory equipment on level six of the Thom Building. A ‘remote site’ is any equipment, or building containing equipment, that is not covered by these rules. The ‘Director’ is the Director of the Computing Laboratory, the Head of the Department of Engineering Science or their agents.

Rules

1. The submission of a completed registration form to OUCL implies that the user has read, understood and has agreed to comply with these rules.
2. No work of direct commercial application may be carried out without the written authorisation of the Director who shall specify any conditions to be observed. In particular, a charge may be made for the use of some or all of the facilities and restrictions may be made on the use of certain items of software.
3. The University will not be liable for any loss or damage sustained by any user in any involvement with OUCL.
4. It is the responsibility of a user to comply with the Data Protection Act 1998, and, in general, with all statutory and other provisions and regulations for the time being in force in the field of data protection and information privacy. Those whose work involves or may involve the storage of personal data as defined in the Data Protection Act 1998 are required to notify the Computing Laboratory in advance.
5. Equipment in the Practicals Laboratory on level six of the Thom Building is available to all users 09:00 to 18:00, Monday to Friday of Full Term. Equipment is available at all times from remote terminals (such as college PCs).

If at any time any undergraduate is requested by an authorised member of the Computing Laboratory staff or graduate supervisor to leave the Practicals Laboratory, he or she must do so immediately.

Undergraduate labs are locked and alarmed outside normal working hours when there is no authorised supervisor present.

6. The times that the Computing Laboratory equipment is available may vary from time to time at the discretion of the Director. In particular, users should note that at certain times, certain equipment is booked for practicals and the like. At these times, such equipment may not be used by other users.

Users must comply with local rules of any building they use or that contains equipment that they use. In particular, users accessing the network through remote terminals must comply with the rules of the Computing Service and users accessing remote sites must comply with the rules of the site that they are connected to as well as the Computing Service rules.

7. Departmental equipment (including workstations, printers and network switches) must not be unplugged, disconnected or switched off. **Students are not allowed to plug in laptops in either the Computing Laboratory of the Thom Building.**
8. Children under the age of 16 years and animals are not allowed in the Practical Laboratory without prior written permission of the Director.
9. Meetings of any kind, other than authorised classes and practicals, may not be held in the Practical Laboratory without the written permission of the Director, who shall specify any conditions to be observed.
10. Notices or posters may only be displayed if they are clearly marked with the name of the person posting and are placed on an appropriate board according to content. The Director reserves the right to remove any notice or poster without advance warning.
11. In the interests of safety and to prevent damage to the equipment, eating and drinking are prohibited in all equipment areas. Smoking is also prohibited in all rooms and corridors.
12. Fire alarms and fire extinguishers may only be used in case of emergency. Any tampering with fire alarms, fire extinguishers, room alarms, locks, key boxes or cabinets will be regarded as an offence against the rules.
13. Students are not permitted to use departmental telephone extensions for external calls on the BT network except in case of emergency. There is a pay phone in the reception area of the Thom Building.
14. No person may make use of OUCL facilities other than for an authorised course unless written permission is obtained from the Director.
15. No person may, by any wilful or deliberate act, jeopardise or corrupt, or attempt to jeopardise or corrupt, the integrity of the computing equipment, its system programs or other stored information. In particular, no user may:
 - a. attempt to store files in any manner whatsoever that could be considered an attempt to evade file quotas;
 - b. allow their password to become known to any other person (if a user suspects that some other person may know their password, they should change it immediately);
 - c. log in, or attempt to log in, to any computer as another user;

- d. take on, or to appear to take on, the identity of another user or for their username to appear changed according to any process or piece of software;
 - e. send unwarranted unsolicited e-mail to others;
 - f. post inappropriate messages to newsgroups;
 - g. knowingly send, or facilitate the sending of, offensive material or knowingly download or store or facilitate the downloading or storing of offensive material;
 - h. send or propagate 'chain e-mail'.
16. No person may act in any way which leads to, or could be expected to lead to, the disruption of the approved work of any other user.
17. The Director may suspend any person who is believed to be in breach of these rules from use of all or specified OUCL facilities. The Director may also make subsequent use of the equipment and/or facilities subject to such conditions as he thinks fit. The Director may, at his discretion, report the matter to the University Proctors with recommendations for further action, except that if a suspension of greater than two weeks is imposed, the matter shall be reported to the University Proctors.
- In the case of the user being a member of a University other than Oxford, or of some other such institution, the matter will be reported to the Director of computing facilities at that University or institution.
18. Failure to discharge a debt to OUCL shall be a cause for suspension from use of the facilities.
19. The Director may make such general conditions on the use of Computing Laboratory equipment as he thinks fit from time to time.
20. Appeal against the actions of the Director under rules 16, 17 and 18 shall be made to the University Proctors.

Use of Department of Engineering Science Premises

In addition to the rules of the University and of the Computing Laboratory, students using the facilities in the Thom Building should be aware of, and comply with, the following rules extracted from the Rules of the Department of Engineering Science:

- 5. Normal working hours of the department are Monday to Thursday, 08:15–13:00 and 14:00–17:15; and Friday, 08:15–13:00 and 14:00–16:45.
- 6. Undergraduate members of the department may use the buildings only during normal working hours except that during term, access to the library, staff rooms and lecture rooms are permitted during the following additional hours: Monday to Friday, after normal working hours up to 19:00; and Saturday, 08:15–13:00.
- 10. Except by permission of the staff member responsible, junior members may not remove tools or equipment from any part of the buildings.
- 12. Except by permission of the member of staff responsible, junior members of the department are not permitted to enter research laboratories, staff offices, stores, workshops (other than the staff/student workshop), roof areas, service

areas, photographic darkrooms, the enquiry office and rooms carrying notices of special hazards. Except in the case of fire, junior members must not use the walk way round the outside of the Thom Building at the seventh floor level.

16. Permission must be obtained from the Head of Department before photographs or articles concerning the work of the department are communicated to the press.
17. Junior members of the department are not allowed to bring cars into the departmental car parks.
18. Motor cycles should be parked in the spaces provided and pedal cycles should be left in the racks, including those adjacent to the Department of Metallurgy and Science of Materials.
19. Those entrusted with a key to any departmental building are responsible for ensuring that the building is properly locked if they leave outside normal working hours. The loss of a key must be reported immediately. The copying of keys is forbidden.

[J] Equal Opportunities Statement for Students

The University of Oxford and its colleges aim to provide education of excellent quality at undergraduate and postgraduate level for able students, whatever their background. In pursuit of this aim, the University is committed to using its best endeavours to ensure that all of its activities are governed by principles of equality of opportunity, and that all students are helped to achieve their full academic potential. This statement applies to recruitment and admissions, to the curriculum, teaching and assessment, to welfare and support services, and to staff development and training.

Recruitment and admissions

Decisions on admissions are based solely on the individual merits of each candidate, their suitability for the course they have applied to study (bearing in mind any requirements laid down by any professional body), assessed by the application of selection criteria appropriate to the course of study. Admissions procedures are kept under regular review to ensure compliance with this policy.

We seek to admit students of the highest academic potential. Except in respect of the college admitting women only, all selection for admission takes place without reference to the sex of the candidate. All colleges select students for admission without regard to marital status, race, ethnic origin, colour, religion, sexual orientation, social background or other irrelevant distinction.

Applications from students with disabilities are considered on exactly the same academic grounds as those from other candidates. We are committed to making arrangements whenever practicable to enable such students to participate as fully as possible in student life. Details of these arrangements can be found in the University's Disability Statement, and information will be provided on request by colleges or by the University Disability Co-ordinator.

In order to widen access to Oxford, the University and colleges support schemes which work to encourage applicants from groups that are currently under-represented. The undergraduate Admissions Office can provide details of current schemes.

None of the above shall be taken to invalidate the need for financial guarantees where appropriate.

The curriculum, teaching and assessment

Unfair discrimination based on individual characteristics (listed in the statement on recruitment and admissions above) will not be tolerated. University departments, faculties, colleges and the central quality assurance bodies monitor the curriculum, teaching practice and assessment methods. Teaching and support staff have regard to the diverse needs, interests and backgrounds of their students in all their dealings with them.

Welfare and support services

Colleges have the lead responsibility for student welfare and can provide details of arrangements made to support their students. The University, in addition, provides for all students who require such support:

- a counselling service,
- childcare advice,
- disability assessment and advice, and
- a harassment advisory service

further details of these services are included in the Proctors' and Assessor's handbook 'Essential information for students', which is updated annually.

Staff development and training

The University, through its Institute for the Advancement of University Learning, will provide appropriate training programmes to support this statement.

Complaints

A candidate for admission who considers that he or she has not been treated in accordance with this policy, should raise this with the college concerned (or department in the case of graduate admission). Students in the course of their studies may use the student complaints procedure, and should, in the first instance, lodge their complaint with the Proctors, who will advise on the procedure to be followed thereafter. The Committee on Diversity and Equal Opportunity monitors complaints made by students. More information can be found at:

<http://www.admin.ox.ac.uk/eop/statements.shtml>

Departmental Disability Co-ordinator

Christine O'Connor – tel. 73863, email cmoc@comlab.ox.ac.uk

[K] Plagiarism

What is plagiarism?

Plagiarism is the copying or paraphrasing of other people's work or ideas into your own work without full acknowledgement. All published and unpublished material, whether in manuscript, printed or electronic form, is covered under this definition.

Collusion is another form of plagiarism involving the unauthorised collaboration of students (or others) in a piece of work.

Cases of suspected plagiarism in assessed work are investigated under the [disciplinary regulations](#) concerning conduct in examinations. Intentional or reckless plagiarism may incur severe penalties, including failure of your degree or expulsion from the university.

Why does plagiarism matter?

It would be wrong to describe plagiarism as only a minor form of cheating, or as merely a matter of academic etiquette. On the contrary, it is important to understand that plagiarism is **a breach of academic integrity**. It is a principle of intellectual honesty that all members of the academic community should acknowledge their debt to the originators of the ideas, words, and data which form the basis for their own work. Passing off another's work as your own is not only poor scholarship, but also means that you have failed to complete the learning process. Deliberate plagiarism is unethical and can have serious consequences for your future career; it also undermines the standards of your institution and of the degrees it issues.

What forms can plagiarism take?

- Verbatim quotation of other people's intellectual work without clear acknowledgement. Quotations must always be identified as such by the use of either quotation marks or indentation, with adequate citation. It must always be apparent to the reader which parts are your own independent work and where you have drawn on someone else's ideas and language.
- Paraphrasing the work of others by altering a few words and changing their order, or by closely following the structure of their argument, is plagiarism because you are deriving your words and ideas from their work without giving due acknowledgement. Even if you include a reference to the original author in your own text you are still creating a misleading impression that the paraphrased wording is entirely your own. It is better to write a brief summary of the author's overall argument in your own words than to paraphrase particular sections of his or her writing. This will ensure you have a genuine grasp of the argument and will avoid the difficulty of paraphrasing without plagiarising. You must also properly attribute all material you derive from lectures.

- Cutting and pasting from the Internet. Information derived from the Internet must be adequately referenced and included in the bibliography. It is important to evaluate carefully all material found on the Internet, as it is less likely to have been through the same process of scholarly peer review as published sources.
- Collusion. This can involve unauthorised collaboration between students, failure to attribute assistance received, or failure to follow precisely regulations on group work projects. It is your responsibility to ensure that you are entirely clear about the extent of collaboration permitted, and which parts of the work must be your own.
- Inaccurate citation. It is important to cite correctly, according to the conventions of your discipline. Additionally, you should not include anything in a footnote or bibliography that you have not actually consulted. If you cannot gain access to a primary source you must make it clear in your citation that your knowledge of the work has been derived from a secondary text (e.g. Bradshaw, D. *Title of Book*, discussed in Wilson, E., *Title of Book* (London, 2004), p. 189).
- Failure to acknowledge. You must clearly acknowledge all assistance which has contributed to the production of your work, such as advice from fellow students, laboratory technicians, and other external sources. This need not apply to the assistance provided by your tutor or supervisor, nor to ordinary proofreading, but it is necessary to acknowledge other guidance which leads to substantive changes of content or approach.
- Professional agencies. You should neither make use of professional agencies in the production of your work nor submit material which has been written for you. It is vital to your intellectual training and development that you should undertake the research process unaided.
- Autoplagiarism. You must not submit work for assessment which you have already submitted (partially or in full) to fulfil the requirements of another degree course or examination.

Not just printed text!

The necessity to reference applies not only to text, but also to other media, such as computer code, illustrations, graphs etc. It applies equally to published text drawn from books and journals, and to unpublished text, whether from lecture handouts, theses or other students' essays. You must also attribute text or other resources downloaded from web sites.

[L] University of Oxford - Code of Practice Relating to Harassment

The University's Code of Practice Relating to Harassment can be found at:
<http://www.admin.ox.ac.uk/eop/har/harcode1.shtml>
and <http://www.admin.ox.ac.uk/eop/har/index.shtml>

The following are extracts from these web pages.

Part I - Policy on Harassment including Bullying

The University of Oxford is committed to equal opportunities and to providing an environment in which all employees and contractors ("staff"), students and those for whom the University has a special responsibility (for example visiting academics and students – henceforth referred to as "visitors") are treated with dignity and respect, and in which they can work and study free from any type of discrimination, harassment, or victimisation.

All staff and students are responsible for upholding this policy and should act in accordance with the policy guidance in the course of their day-to-day work or study, ensuring an environment in which the dignity of other staff, students, and visitors is respected. Offensive behaviour will not be tolerated.

Harassment is a serious offence which is punishable under the University's disciplinary procedures.

Heads of department and their equivalents, those with significant supervisory duties, and others in positions of responsibility or seniority, including students who fall into these categories, have specific responsibilities. These include setting a good personal example, making it clear that harassment will not be tolerated, being familiar with, explaining, and offering guidance on this policy and the consequences of breaching it, investigating reports of harassment, taking corrective action if appropriate, and ensuring that victimisation does not occur as a result of a complaint. Instances of harassment should be brought to the attention of an appropriate person in authority, such as a head of department or a senior college officer.

The University is committed to making all staff and students aware of this policy and the accompanying guidance and to providing effective guidance and briefing on it. The University will take steps to ensure that both the policy and guidance are fully understood and implemented. The policy and guidance will be brought to the attention of all staff and students and are available on the website. The policy will form a part of every employment, and student contract, or relationship, or contract for services. The University will encourage a culture of non-tolerance of any form of harassment.

This policy and the accompanying guidance, which should be read in conjunction with the University's Equal Opportunity Policy and Race Equality Policy, will be the

subject of regular review by the General Purposes Committee of Council in consultation with other appropriate committees, including the Personnel Committee.

Information concerning allegations of harassment should be treated in the strictest confidence. Breaches of confidence

Definition of harassment

A person subjects another to harassment where he or she engages in unwanted and unwarranted conduct which has the purpose or effect of:

- (a) violating that other's dignity, or
- (b) creating an intimidating, hostile, degrading, humiliating or offensive environment for that other.

Harassment may involve repeated forms of unwanted and unwarranted behaviour, but a one-off incident can also amount to harassment.

Acts of harassment may be unlawful. Harassment on grounds of sex, race, religion, disability, sexual orientation or age may amount to unlawful discrimination. Harassment may also breach other legislation and may in some circumstances be a criminal offence e.g. under the provisions of the Protection from Harassment Act 1997.

Reasonable and proper management instructions administered in a fair and proper way, or reasonable and proper review of a member of staff's or a student's work and/or performance will not constitute harassment. Behaviour will not amount to harassment if the conduct complained of could not reasonably be perceived as offensive.

Guidance on taking action if you believe you have been harassed

Informal or formal resolution?

If possible, you should attempt to resolve the matter informally; it may be that the alleged harasser does not know what effect his or her behaviour is having on you. If an informal resolution can be effectively achieved, this will in many cases be advantageous to you. It is however recognised that, in some cases, only a formal procedure would be appropriate.

Regardless of whether you succeed in resolving the matter informally, or decide to bring a formal complaint, try to keep a factual record of the offending behaviour. It is easy to forget details after the event and such a record will help you when seeking advice, in deciding whether to make a complaint, in formulating the complaint and in giving evidence at any subsequent hearing.

The harassment advisor will discuss with you what steps you can take to try to reach an informal resolution. The first step may be to speak with the alleged harasser and let him or her know that you object to his or her behaviour, explain why you object and

ask that they stop. You should keep a factual record of what is said and done and of any witnesses present. Alternatively, or as a second step, you could put your objections and a request to stop in a letter addressed to the alleged harasser. Again, keep a copy. It is not advisable to communicate with the alleged harasser by email as these are easily copied and all too quickly sent without proper consideration of the wording.

The harassment advisor cannot tell you what you should say, or write a letter for you, but he or she can guide you, discuss the steps to take and review the outcomes with you. If the behaviour continues regardless of your requests to stop, or, if attempting an informal resolution is not appropriate in the first place, the next stage will be to make a formal complaint.

The Harassment Advisors for the Computing Laboratory are:

Christine O'Connor - Tel. 73863

and

Nick Trefethen - Tel 73886