

**Blackett Laboratory**

**INTRODUCTION TO**

**COMPUTING FACILITIES**

October 2010

**BEFORE THE END OF WEEK 1:**

You should have set up the following to avoid future problems.

* You should have **set a password** on your Imperial College account
* You should have checked that **the Printer is set up** correctly on your account
* You should have checked that you can **send and receive email** using your new Imperial College account.
* You should have checked that you can access the course material for ***Year 1 Computing*** on **Blackboard.**

The instructions for how to do all these things are found in this document.

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# Introduction

Welcome to the computer network at the Blackett Laboratory!

This document helps you set yourself up for your new Imperial College account and familiarise yourself with the facilities available. This will not take long for those of you who are familiar with the Microsoft Windows operating system. If you are unfamiliar with this environment, do not hesitate to ask for help from your demonstrators.

## Computing Suite

The computing facilities in the Blackett Laboratory for the use of our undergraduates are located on Level 3. The computing suite is open 0800-2200 Mon-Fri and 0900-2200 Sat & Sun. Access is by use of your college security card.

The suite consists of a large room and a smaller annex. The annex is reserved for teaching use during 1st and 2nd year lab hours so that lab sessions are not disrupted by general traffic. Otherwise, you are welcome to use any available PC at any time during opening hours.

The machines in the main room of the computing suite have Intel processors with at least 4GB RAM. All PCs are networked and run the same software packages.

## Rules

College rules must be obeyed when using a college PC. They are found at: <http://www.imperial.ac.uk/secretariat/policiesandpublications/informationsystemssecurity/policy/policy2>

They are summarised in the *Policy statement on misuse of computing facilities at Imperial College*, a copy of which is posted in the Computing Suite. Deliberate misuse of College computers is a severe College disciplinary offence and may carry legal penalties. The key points of this policy are:

* You can only use a computer when you have permission to do so.
* You cannot copy any software whatsoever without permission of the copyright owner.
* You must not use the computer system to store, transmit or display offensive material, such as sexual, pornographic, racially offensive or abusive material. If you have any doubt about any material’s suitability, then don’t touch it. Web access is monitored both within and outside our own department. Failure to comply with this rule will result in disciplinary action and could mean removal from Imperial College. (This *has* happened.)
* Under the Data Protection Act, you may not record on a computer system any information concerning living persons without authorisation, unless your use is specifically exempt.

In addition, we have some local rules concerning the physics cluster:

* No games: there is a high demand for the PCs throughout the day
* Do NOT share your password with anyone
* Do not shut down or switch off PCs: they are updated remotely *via* the network throughout the day. (When you have finished, simply Log Off.)
* No food or drink to be brought into lab.
* Do NOT unplug any cables – there is a separate area if you wish to connect a laptop, and wifi is available throughout the room
* Switch off mobile phones. PLEASE!

## Getting started

A username and temporary password have been set up automatically for you by the computing services (ICT). If you have not already activated your account, here is how you can do it at the Computing Suite:

1. Enter the username *activate* and then the password *Activate!* (Note the Capital A and the exclamation mark in the password.) This will automatically take you to the webpage <https://www.imperial.ac.uk/ict/activateaccount>
2. Read the Conditions of Use. Click on the box **Accept** at the bottom of the page to accept that you will abide by these rules when using the Imperial College network.
3. In order to identify you, you will now be asked for your first and last names, your date of birth and your College identifier (CID). Your CID can be found on most official correspondence from the College or on your College security card.
4. You will now have to **choose a secure password** for yourself. Make sure that you choose a password you can remember (even after a long summer holiday!) Resetting a password has to be done manually by authorised ICT personnel. Click on “*How to choose a strong password”* for advice on how to choose a password that minimises the risk of it being hacked. In particular, the password should
* Be more than 6 characters long
* Include at least 3 out of the following 4 categories: lower case letters, upper case letters, numbers and special symbols.

Weak passwords are rejected by the system.

**Never tell anyone your password**, includingpersonnel from any support desk.

1. When you have decided on your password, enter it twice into the online form.
2. When you have completed the form, click on the **Activate My Account** button.

Your account should be activated automatically immediately. Your new **username** and your @imperial.ac.uk **email address** will be displayed on the screen. Write these down somewhere safe so that you will not lose them. (But do not write down the password in the same note!)

## Logging on and off

Now that you have activated your account, you can log on to the college network.

To **log on,** hold **ctrl**, **alt** and **del** keys down at once. [We will use the notation + (e.g. **ctrl + alt + del )** for simultaneous use of keys.] This will bring up a window which prompts you for your username and password. Enter your username and password and you will be logged into your account. A setup script will run automatically: you will see its progress in a window with a black background. ***Do not close that window prematurely***, otherwise your session will not be set up properly, *e.g.* you might not have access to any printers.

If an error message pops up saying that you will only be using a temporary profile, please bring this to the attention of a demonstrator. We will contact ICT to fix the problem.

The screen you see when you log on is called the ‘Desktop’. It contains several useful icons for direct access to frequently used programs. More utilities and software can found if you click on the **Start** button at the bottom left of the desktop.

When you have finished your session, remember that you have to **log off** from the network. To do so, you also use the **ctrl+alt+del** keys, but this time choose **Log off**. You can also use **Start** followed by **Log Off**. This will leave it ready for the next user to log on. **Do NOT** **shutdown** the computer.

## Disks and File Storage

Files are stored on disks (or drives) on each PC and also on the College file server. Click on the **My Computer** icon located near the top left corner of the desktop. A window will open up showing you the disks that you have access to.

The local disk on each PC is the **C: disk**. You can write files for temporary use to C:\temp\*your\_username* but these are deleted every evening. You cannot modify files on the C: disk.

All files that you want to keep should be put on the **H: disk**. These are not physically stored on the PC. Instead, they are stored on a central file server in the College. This means that you can access your files from any computer in the college. When you log on, to any of the PCs in the cluster, you will automatically be linked to your own H: disk. You have a ***storage allocation of 1GB***. You will need to purge files regularly to keep well within this limit. Music and video files take up a lot of disk space, and are generally not needed for your work. If you exceed this quota, you will find that your programs will not run due to lack of disk space.

## Software

The operating system is Windows 7 Enterprise and you should spend a little time making yourself familiar with it.

To find out what programs you can use, click on the **Start** button at the bottom left corner of the desktop, and then click on **All Programs** entry. All the packages you need for your coursework can be found here. **Word**, **Excel** and **Outlook** can be found under the **Microsoft Office** menu.

Also accessed through **Start** are a number of other facilities, including the **Search** button which you can use to find files.

On the left hand side of the “desktop” there are a number of icons including:

**My Computer** alternate route to disks, files and control panel

**Internet Explorer** access to the internet

**Outlook** access to email

Spend a little time familiarizing yourself with what is available and where to find it.

## Printers

You should be able to print a file from whatever package you happen to be working on. To do so, you typically choose **File | Print** (meaning click on **File** and then **Print** from the submenu that pops up) from the menu (or click on the printer icon directly). On Microsoft Office 2007 applications, the Print command is found on the drop-down menu that appears when you click on the Microsoft Office logo at the top left corner of the window.

The printers you use for computing lab will be the ones in the Level 3 computing suite. You should be able to see the available printers after you have selected Print.

* For colour, choose **ICTprintservice colour (PCL)**
* For black and white, **ICTprintservice mono (PCL)**

Then, click **OK** to the file to the printer.

To collect the document, go over to the printer you have selected. Run your Imperial College swipe card through the reader. Press **PULL PRINT** from the options menu on the printer. Your document should now be listed. Press the Print button to print the file. *After the document has printed, make sure that you log out of the printer so that it is ready for the next user.*

Printing costs 3p per sheet for black & white and 12p for colour. You will receive £5 worth of printing credit free at the start of each year. Subsequently you have to buy credits online or using a machine in the Central Library.

You can **check your print credit by clicking on the desktop icon “ICTprintservice”.** The print quota should be set up by the end of the first week of term.

This ICT service in fact allows you to use any printer in the college, for example, for high-quality colour printing. For more information on the printing service, see <https://www.imperial.ac.uk/ict/printservice/>.

# Useful packages

Many of the packages you will use are in the integrated suite called ***Microsoft Office***. We are now using the 2007 edition of this software. This section contains very brief introductions to *Word* for word processing. Use of *Excel* for presenting results will be discussed during the computing lab session on Measurements and Errors.

## Microsoft Word

MS Word is a word processing program with which you can create reports, letters and documents. Its functionality is integrated with other MS Office programs. For example, you can take an Excel graph and insert it into a Word document. Word is recommended for lab reports.

You can find **Microsoft Word** under the **Start** menu. As usual, you double click on the icon to open the program. Word opens a blank document into which you may start typing your report.

You can get to the commands to save and print the document and to open new documents by clicking on the Microsoft Office logo at the top left corner of the window. There are other tabs for different menus across the top of the window. Under **Home**, you have the Clipboard where copy and paste functions are found. You also have the Font, Paragraph and Style menus for formatting text (see below). Under **Insert**, you find functions to insert tables, figures, cross-references, *etc*. Under **Review**, you can find the spell checking facility.

### Styles and formatting

One of the few things you must know right away in Word is the way it handles paragraphs. If you type a carriage return, the program thinks you are starting a new paragraph and will indent and space out the new paragraph according to the present paragraph settings. You should only type returns when you really want to have this sort of formatting; otherwise, just keep on typing and Word will sort out newlines automatically for you. Formatting the paragraph can either be done manually by clicking on **Home**, choosing the options under **Paragraph** as appropriate or by clicking on a choice of established styles in the **Styles** box. This will probably start off with the Normal or Plain Text style but the dropdown menu offers numerous others including different ranks of headings which can make a document much clearer. If you construct a style you like and want to save you can do this using **Format** then **Style** then **New Style** giving it a name you can remember.

If you use the automatic numbering of headings or of bullets (see toolbar) then you can add in new items and delete others and the lists will be automatically re-numbered.

Using the functions under **Home | Font** you can change fonts, *italicize* words, make them **bold**, make them super- or sub-scripts etc. There are many options. The best way to learn is to try them out and use the **Get Started** facility.

If you see a word underlined in a wiggly red line, it thinks you have misspelt something. You can try its automatic correction facility (click the right mouse button with the cursor over the word) but beware: it sometimes makes embarrassingly wrong choices. You may also want to set the spell checker to use UK instead of US spellings. This is found under **Review | Proofing | Spelling & Grammar.**

### Equations in Word

If you want to insert an equation that is anything more complicated than *E*=*mc*2 then the Equation Editor comes in useful. To use this facility click on Insert then Object then Microsoft Equation; you can then type into the box, using any symbols required from the drop-down menus.

### Importing graphics

There are many ways to import graphics into your Word document. You can use **Insert | Picture**. Once inserted you can reshape, resize and reposition your picture by clicking and dragging the handles on the corners/edges of the plot.

## Other packages/programs

A number of other packages are installed on the PCs including:

**Excel** for manipulating data and presenting results as graphs or tables

**PowerPoint** for presentations.

**MatLab** and **Maple** maths packages and graphics.

**Adobe Reader** for reading documents written in portable document format (pdf files).

**Ghostscript** for reading files written in postscript (.ps files).

**Visual C++** C++ compiler

**GSL** GNU numerical library (routines can be incorporated into C++)

**Firefox** alternative open source web browser

All these have online help facilities if you wish to teach yourself how to use them.

# World Wide Web

The World Wide Web has become an essential part of scientific life: not too surprising, given that it was invented by physicists! We publish scientific reports and share our results on the web. Most scientific journals have online editions and the College library subscribes to them.

We do not prohibit non-science usage on the college network. However, we discourage excessive use in the computing suite especially during busy times. Of course, you should not use the network inappropriately in violation of the Conditions of Use [see section 1.2] to which you have agreed when you activated your account.

To browse the web, double click on the **Internet Explorer** browser icon on the Desktop (you can also use **Firefox** which can be found inside the programme menu under Mozilla Firefox). The first page you find is your home page, probably the Physics Department’s home page. It has an address (or URL for “universal resource locator”) with the name <http://www.imperial.ac.uk/physics/>. You can jump to other pages by clicking on highlighted words (“links”) or on the horizontal menu items near the top of the page. Click on some of the items and learn more about your department.

You can add the names of sites you need to access often to your **Favorites** (see menu bar) to avoid having to remember the names of sites that you visit frequently.

If you know the URL of a site you want, you can type it in the **Address** box and press Return. Some useful sites are:

*ICT information for new students:* <http://www.imperial.ac.uk/ict/services/newstudents>

*ICT software for students:* <http://www.imperial.ac.uk/ict/services/personalcomputersupportandmobileservices/softwarepurchase>

*Institute of Physics Physicsweb:* <http://physicsweb.org/>

*Google search engine:* <http://www.google.co.uk/>

*Imperial College website*: <http://www.imperial.ac.uk/>

You can access all areas of the Imperial College website from anywhere. Some pages, such as those containing teaching material and security information, are restricted for college members only. You will be prompted for your Imperial username and password when accessing these pages.

# Email

This is now the principal for communication in the college. The teaching staff (*e.g.* the senior tutor, your academic and personal tutors, demonstrators, heads of lab) will use this to send you important information, *e.g.* scheduling tutorials, assessment meetings, *etc.*

**IMPORTANT: Check your college email account regularly.**

You can keep 500MB of email messages on the college mail server (separate from the 1GB quota for files stored in the H: disk).

## From within Imperial using a College computer

You should use **Microsoft Outlook** for your email. This is located under the Microsoft Office menu under the Start menu. [NB: Do *not* use Outlook Express]. A list of messages received in your **Inbox** will be automatically displayed. You can read a message by double-clicking it. To delete or reply to messages or to write new ones, use the icons on the toolbar.

***Send yourself an email to make sure that your new email address works!***

## From outside Imperial or using your own computer

There are two ways to access your email from outside the college. If you are not an experienced user of email applications, use the first method: it is simplest and safest.

1. Use the **web-based email interface** of the college mail server. Find any PC with a web browser and go to the website https://icex.imperial.ac.uk. Type your college email address without the domain name (*i.e.* leave out @imperial.ac.uk) in the box and then, when prompted, your college username and password.
2. With your personal computer, you can set up any email client to access the college mail server. You need to have administrative privileges on the PC to set this up. Different email applications have different setup procedures. The key information you need is that the college mail server is located at the address icex.imperial.ac.uk. It supports the POP3 and IMAP protocols for how email applications communicate with mail servers. To find out more, look up the web page for the computer centre (ICT) at <http://www.imperial.ac.uk/ict/> and follow the link to **Services | User, Email, File and Directory Services | Email**. Be careful about a couple of things.
	* Many email client applications will, by default, download the messages from the mail server onto your PC and then remove them from the server. This means that they will not be there when you next check your messages on a college computer! This default setting should be changed so that the mail application *leaves messages on the server*. (For the expert, this issue applies to the POP3 protocol, but not the IMAP protocol.)
	* You should switch on a security feature on your email application that would encrypt your college password so that it cannot be “sniffed” as it travels across the internet. This feature is usually referred to as SSL or TLS, and there should a tick box to enable this security feature in some Preferences or Configuration menu.

# Blackboard e-Learning System

Most of our teaching material is on the Blackboard system (formerly WebCT) at <http://learn.imperial.ac.uk/> . This is a virtual learning environment. It contains material for your courses, such as lecture notes, problem sheets, solutions and online quizzes. There is also a facility to communicate with your lecturer and fellow students. Information can be found at:

<http://www.imperial.ac.uk/ict/services/teachingandresearchservices/elearning/vle/forstudents/>

**IMPORTANT: Make sure that you can log on to Blackboard and that you can see the course material for Year 1 Computing. If not, tell your demonstrator.**

# Using your own PC / laptop

It is not necessary to own a PC or laptop to carry out all the work required for the physics degree. It can, of course, give you the freedom to work on programs, reports etc. in your own time. However, for the formal taught computing labs, you are required to spend the appropriate sessions in the computing lab so that your progress can be monitored and assessed by demonstrators. NB: lab marks are weighted by attendance.

If you need to buy software for your machine, there are discounted offers for students available through the college’s ICT shop, see [https://www.imperial.ac.uk/ict/services/software/shop/](https://www.imperial.ac.uk/spectrum/ict/services/software/shop/). In particular, you can obtain Symantec anti-virus software for free.

## Connecting your laptop to the college network

When you are on campus, you can connect your computer to the Imperial College network (which includes the halls of residence) using a wireless connection or an ethernet connection. The information can be found at the ICT web pages <http://www.imperial.ac.uk/ict/>: follow the links to **Services | Security, Network, Data Centre and Telephony Services | College Network | Network Connections**. The following is a brief summary.

You need to register your laptop/PC with ICT. This is to ensure that only members of the college have access to the college network. To do so, go to <http://netreg.ic.ac.uk/>.

### Wireless connection

You will need a wireless network card (802.11b or 802.11g). The network name (SSID) will appear as **Imperial-WPA**. (Do not log on to any wireless networks with SSIDs that you do not recognise: they may be illegal networks that will collect all your passwords!) It will prompt you for your Imperial username and password to authenticate you as an authorised user of the network.

### Wired (Ethernet) connection

Your computer should have a built-in network card. You will need an ethernet cable which can be purchased from the Union Shop. You should set up the machine to obtain its IP address automatically (from a college DHCP server) and to obtain the DNS server address automatically. On Windows XP, you can set this up as follows: **Start**, **Settings**, **Network Connections**, **Local Area Connection**, **Properties** (on General tab), select **Internet Protocol (TCP/IP)**, **Properties**, then check the boxes marked **Obtain IP address automatically** and **Obtain DNS server address automatically**. [NB if you previously had any other IP/DNS settings which you might need to use again, take a note of them before carrying out the above procedure as they will be removed. However, most internet service providers will assign these addresses automatically.]

Non-Windows machines can also be connected to the network. Instructions for Linux and MacOS can be found on the ICT webpages.

## Access when you are away from campus

If you are not on campus and you need to access files stored on the college network, you will need to establish a Virtual Private Network (VPN) connection to the college. For details, go to <http://www.imperial.ac.uk/ict/>, and follow the links to **Services | Security, Network, Data Centre and Telephony Services | College Network**. This will allow your computer to behave as if it is on the college network (even though you may be half way across the world!) With this connection, you can

* access your college files using the “Add a Network Place” method described in section 6.3
* access Imperial College web pages that are restricted to college members
* access services restricted to Imperial College members, such as electronic journals to which the college library has subscribed.

Note that, while the VPN connection is up, the Conditions of Use of the college network applies to  *all* the internet traffic of your PC because it will be routed through the college network.

Non-Windows machines can also be connected to the network from outside college. Instructions for Linux and MacOS can be found on the ICT webpages.

## Working from your own computer: access to your college files

You would often want to transfer your reports, programs, results, reports *etc.* between the college network and your personal computer. There are many ways to do this.

For small files, you can simply send them to yourself by email. (You can check college emails from outside the college, see 4.2 above.)

For files larger than 1MB, you can copy them onto a removable disk, such as a USB storage device (“memory stick”). These methods, although inelegant, have the advantage that they are simple, reliable and need no further setup.

If you are using a Windows machine, you can use “Add a Network Place” to access the college file servers directly. You can find the name of the file server where your files are stored in the Network Drives listing of My Computer when you log in on a college computer. It should be something like: [\\icfs6.cc.ic.ac.uk\your\_username](file://icfs6.cc.ic.ac.uk/your_username). You should be able to make use of this facility if your computer is on the college network. If you are outside college, then you need to establish a VPN connection first (see section 6.2).