Demonstrator Training 2013

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Overview

- Introduction to the Physics Teaching Labs
- The role of the demonstrator
  - Ensuring the students work safely
  - Helping the students
  - Assessing students
- What qualities should a good demonstrator have?
- Practicalities
  - Marking/booking
  - Making suggestions and giving feedback on experiments
- Further opportunities for demonstrators
- In-lab training

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Introduction (1): Lab hours and requirements

- The Physics teaching labs are located on levels 1 and 2 of the Denys Wilkinson Building.
- Lab hours are 10-5. Please ensure you arrive and leave promptly so that the technicians can go home!
- Labs will be closed if demonstrators are not present
- Practical work, in the form of laboratory experiments and computing, is compulsory for all students.
  - First years: Thursdays and Fridays in Michaelmas and Hilary Terms
  - Second years: Mondays and Tuesdays in Michaelmas and Hilary (computing and electronics only) Terms
  - Third years: Mondays and Tuesdays in Michaelmas and Trinity Terms
    - MPhys students will do a mini-project in MT over 2 weeks

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Introduction (2): Experiment booking and marking

- Students carry out experiments from a script – available online via the web-based "management scheme" booking database (more on this later).
- Students should obtain and read through the script in advance. Send away those who haven't prepared.
- They should make good quality notes in pen in a logbook (not loose leaf)
- Assessment:
  - Continual, during experiment
  - Marking takes place at the end of the experiment
  - Some other forms of assessment are used (more on this later)

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Introduction (3): Who's who

Neil Clifford
Systems manager

Keith Long
Senior technician

Peter Shrimpton
Senior technician

Mohamed Cheddi
Technician

Plus administrative support from Hannah Glanville

Jeff Lidgard
Technician (Part time, mornings only)

Joe Brown and Kahinde Johnson
Technicians (Electronics)

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What is the role of the demonstrator? 1. Safety

- **This is the MAIN demonstrator responsibility. You MUST take a lead, right from the start.**
- Be aware of the specific hazards for your lab (pins in optics, radioactivity/ cryogens, DSE for computer-based experiments)
- **No student eating and drinking at all anywhere in the labs** (ok for demonstrators, discreetly at desk area). **You must tell students not to eat or drink. Their water bottles must stay in their bags.**
- **No electrical devices can be plugged in to mains** unless electrically safety tested. **You must check this and inform students if necessary.**
- It is **your** responsibility to decide when a lab is full and turn students away if necessary.
- For 3rd year labs you must help some students write risk assessments.
- You must know what to do, **and take a lead** if there is an emergency. Be aware of fire exits from your lab and assembly points. Fire alarms are tested Mondays 10am.
- All labs contain emergency contact sheets. Any accidents **must** be recorded, in incident book (held by Keith Long) no matter how minor

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What is the role of the demonstrator? 2. Helping students

- Scripts instruct students to consult a demonstrator regularly. In newer scripts, questions are highlighted.
- If you spot a mistake, tell your Head of Lab
- DemonsWiki contains notes for demonstrators that you can add to (see later in talk)

Instructions →

4 Making the measurements

4.1 Inertia and spring constant

Measure the mass (m) of the suspended weight including the graduated scale on a chemical balance (you can ignore the mass of the spring). Reattach the weight using the spring. Measure the spring constant (k) by measuring the extra extension of the spring when first one, then two, of the 50g brass weights are attached just below the graduated scale. Record the two extensions, derive a value for k and express it in Nm^{-1}. From the theory calculate an expected value of ω_0 and predict the period for free oscillations.

► **Comment on the precision of this prediction. What has limited it?**

4.2 Period of free oscillations without damping

Remove the magnet assembly. Check the alignment of the apparatus (section 3.1 and 3.2) ensuring that the drive is not switched on on. Switch the function switch to period. Pull the mass bar down by about 5 cm and release. Record the period indicated in seconds.

► **Comment on the precision of the period obtain, and compare this result with the predicted value.**

Demonstrator question ↗

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What is the role of the demonstrator? 2. Helping students

- Students can turn up and do any practical that is not claimed by 1015. Help them to find a free one if necessary.
- They may ask demonstrators to book them in – senior demonstrators can cancel previous bookings. **There is no real need to book students in on the day if you can see that there is space for them.** During experiment:
- Demonstrators should move around the lab, looking for students who need help and checking up on the progress of others (using the highlighted, or other, questions).
- Sign books that have been checked at lunchtime, or at the end of the first day, and write a comment to suggest a mark (e.g. "very good" suggests S+ standard, "OK/Good" suggests S).
- Be sensitive to the students' needs
  - Some may find it difficult to ask for help
  - Some may have difficulties with certain tasks, for a variety of reasons

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What is the role of the demonstrator? 3. Assessment

- At the end of each lab session, students are given a grade (more on the mark scheme on the next slide)
- Students are marked on the basis of
  - Understanding of the physics of the entire experiment: assessed by a discussion with the demonstrators
    - Look for questions/comments on the demonstrator wiki (or add your own)
  - Keeping a clear and complete record of their work: assessed DURING the experiment by the demonstrators and also checked over at the end
  - A clear written summary in their logbook
- Demonstrators also assess 1st year general physics and optics reports, and 2nd/3rd year "assessed practicals" (oral exams in 6th week Trinity Term)

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The mark scheme

Mark	Requirements
NS: Not attempted or unsatisfactory	• Lacks understanding of the physics of the experiment and the method and apparatus. • The analysis will be marred by serious errors. • Notes, graphs and tables will be missing or used inappropriately. • Will most likely contain no analysis of experimental errors. • The student is unwilling or unable to improve the standard to S level even after substantial input from demonstrators.
S: Satisfactory	• Shows reasonable understanding of the physics of the experiment and the method and apparatus. • This will be a competent attempt at all aspects of the work required, including experimental errors where necessary. • Notes, graphs and tables will be adequate, but could be improved. • Some units or quantities may be wrong and there may be some inappropriate appreciation of numerical precision.
S+: Excellent work	• Shows a good understanding of the physics of the experiment and the method and apparatus. • Exhibits insight and possibly originality, combined with a very good ability to analyse and synthesise the results. • Notes, graphs and tables will be clear, well organised and correctly labelled. • There will only be minor errors in any calculations, units or quantities, and the appropriate numerical precision required will be appreciated.
S/S+: Almost S+	• Just missing the S+ level. For example, a very good attempt at a practical, with perhaps some difficulties in understanding one section • Mark the practical S but write a comment explaining S/S+ in book and on computer

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Booking and Marking guidelines

- S+ should only be given to top ~30% of students.
  - Should be given only for excellent work, NOT just for completing extra parts of the practical.
  - Some practicals have optional sections for extra credit, which should be indicated clearly on the script. Make sure you are awarding the right number of days.
- It is OK to give paired students different marks if they haven't contributed equally to the work.
- You **MUST** enter the mark **BOTH** in the Management Scheme **AND** in the student's logbook.
  - Be careful to enter the correct date when marking, either in "Oxford format" (MonM1) or "normal" dates (8/10/13). **Incorrectly entered dates are a major source of problems.**
- Plagiarism/misconduct is uncommon but does happen occasionally. Please be aware of this possibility (e.g. a results table was written in a logbook without the instrument calibration…)
- If you have any concerns about a student's work DO NOT sign off their logbook. Contact a senior demonstrator.

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What qualities should a good demonstrator have?

- **Committed**
  - This is a position of responsibility. Non attendance/pulling out without good reason or notice disrupts the students' education
  - Please organise a swap if you cannot attend. Contact the head of lab if there are problems.
- **Competent**
  - Should be familiar with all the experiments in the lab, and ideally, have done several of them recently. Do not assume that you know experiments just because you did them as an undergraduate.
  - Should have prepared clear answers to script questions
  - Be aware of how much time/attention to give each student
- **Proactive**
  - Actively interact with all the students, even the ones who don't ask for help
  - Try to foresee problems and lead the students in the right direction, without being too prescriptive, by e.g. careful questioning
  - The students expect demonstrators to take the lead if there are any problems
- **Approachable**
  - Be friendly and helpful. If you don't know the answer to a question, try and find someone who does (usually an experienced senior demonstrator).
  - Don't pretend you know what you're doing, or deny all knowledge, as the students are not impressed by either.

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Practicalities

- Please sign up for an account **today** on our online booking/ marking database (accessible from Oxford network only) https://manageserver.physics.ox.ac.uk/login
- Demonstrators' Wiki is for leaving feedback/discussions with other demonstrators (Oxford network only) – register at https://demonswiki.physics.ox.ac.uk/
- You must provide proof of right to work in UK BEFORE YOU START, otherwise you can't get paid.
  - You need to provide your passport, bank details and NI number to Aidan from Human Resources during the session today (11-12 and 2-3 pm)
  - Or you have to arrange it yourself with the Clarendon Finance Office
- Get paid at end of term by filling in claim form from http://www2.physics.ox.ac.uk/staff - your Head of Lab will need to sign it. Send to Carrie Leonard-McIntyre.

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Further opportunities for demonstrators

- Demonstrators are welcome to get involved with improvements to experiments
- There is almost always work on scripts to be done: LaTeX transcribing, editing
- Can be paid for extra hours – see me if interested
- Higher Education Academy accreditation is possible (see next talk)

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Summary

- Demonstrators play a key role in the teaching of practical physics skills, and can "make or break" the laboratory experience for the student.
- Most of the negative feedback we get in the teaching labs is about poor quality demonstrating, specifically demonstrators not knowing experiments (especially those who pretend they do…)
- Now move to the teaching labs to get hands-on training

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Training in the labs

(See me if you don't know where to go)

Lab	Head of Lab	Training
General (1st year)	Dr Chris Palmer	11am TODAY
Electronics (1st year)	Dr Richard Nickerson	11am TODAY
Optics (1st year)	Dr Mattias Tecza	1-4pm TODAY
Electrostatics & Magnetism (1st year)	Dr Jonathon Hodby	11am TODAY
Thermal Physics (2nd year)	Dr Patrick Baird	Training will be in-lab in first few days of term (Feel free to go down and look at the lab now)
Computing (1st and 2nd year)	Dr Jeff Tseng/Dr Robert Bradley	11am TODAY
Electronics (2nd year)	Dr Guy Peskett	(No new demonstrators?)
Nuclear (3rd year)	Dr Giles Barr	(No new demonstrators?)
Physics of Atmospheres and Oceans (3rd year)	Dr Neil Bowles	11am TODAY
Biophysics (3rd year)	Dr Richard Berry	3rd October
Optics (2nd/3rd year)	Dr David Lucas	NOW with Dr Anthony Dyson
Condensed Matter (3rd year)	Prof Robin Nicholas	Training will be in-lab in first few days of term (Feel free to go down and look at the lab now)
Astrophysics (3rd year)	Dr Andy Bunker	11am TODAY