



DEPARTMENT OF PHYSICS & ASTRONOMY

**Teaching and Learning:
Opportunities for Postgraduate Students and
Postdoctoral Staff
*Academic Session 2017-18***

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1 SUMMARY & APPLICATION PROCEDURES

Postgraduate students and postdoctoral staff make an invaluable contribution to the Department's teaching and learning, and are much appreciated by our undergraduate students. Contributing to the teaching and training of future scientists is a deeply rewarding experience: the questions posed by our undergraduates can cause you to think more deeply about all sorts of areas of science, particularly those that you thought you understood!

Applications are invited from postgraduate students and postdoctoral staff who wish to be considered for a range of Teaching and Learning opportunities within the Department of Physics & Astronomy at UCL. Typical activities are demonstrating in the undergraduate laboratories or computing sessions, and helping with projects or problem-solving tutorial classes. Training and guidance will be given by the course or activity organiser, and we encourage all our teachers to participate in the UCL Arena One scheme, which can lead to the qualification "Associate Fellow of the Higher Education Academy".

1.1 *Postgraduate Students*

If you wish to apply to be considered for one of our Teaching and Learning roles, please send a short CV to Professor Neal Skipper (Director of Teaching, email: n.skipper@ucl.ac.uk), who will also be able to address any general questions you may have.

Your CV should contain the following information:

- Full name;
- Academic Qualifications;
- National Insurance No. (if known);
- Your Student registration number;
- A short statement of why you want to teach, and summary of your areas of expertise and preferences for posts (please see section 5);
- The name of your Supervisor;
- Month and year your postgraduate studies are due to finish assuming you complete and submit your thesis on time.

Applications are welcome at any time throughout the year, but you cannot be considered for any paid employment within the Department until you have applied and been accepted.

Students on Tier 4 visas are able to apply for these roles but need to be aware of the working rights attached to their visa. See <http://www.ucl.ac.uk/iss/immigration-visa/tier-4-responsibilities> for further information. Students on tier 4 visas who are studying in the UK are able to undertake paid/unpaid work but are limited to the number of hours (20 hours maximum typically) that they can work in a rolling 7 day period (Monday to Sunday). While responsibility to ensure visa compliance lies primarily with the student worker, UCL as an employer also have a responsibility when allocating work to student workers on tier 4 visa's and in monitoring how much work is being undertaken. It is vital that both our tier 4 student workers and UCL can demonstrate compliance with the visa regulations set by UKVI. The consequences

for anyone found to be breaching the working hour restrictions are severe (fines for the Department up to £20,000 and possible revocation of visa for the student worker). To mitigate the risk of any student being allocated or working more than their allowed hours UCL has developed timesheets as an interim solution to increase the ability of UCL to monitor compliance. The Tier 4 student will need to complete a weekly time sheet detailing hours worked, this will be signed off by the coordinator who allocated the work to confirm the hours and will need to be submitted to the Nadia Waller.

Successful applicants will be issued with an 'As and When' contract. See http://www.ucl.ac.uk/hr/services/oec/guidance_ucl_coe.php#8 for details on this.

Note that a Right to Work check will need to be carried out before you are able to commence work (Section 3.1). **You will not be able to carry out any work until we have seen and verified this.**

Please note also the [RCUK Training Grant Guidelines](#), section 29: “*Students may undertake teaching or demonstrating work when this is compatible with their training and provided their supervisors approve. The total time spent (including preparation and marking) should not interfere with the progress of the PhD. The amount of time is at the RO and supervisor’s discretion but it is recommended that this is no more than six hours in any week. It must not be compulsory and must be paid for at the RO’s usual rate and supported by appropriate training. Costs for demonstrating or teaching may not be taken from the TG*”.

1.2 Postdoctoral Staff

We ask that postdoctoral staff undertake teaching and/or demonstrating work, including associated training, preparatory, marking and examination duties. This will typically be a commitment of around 60 hours per academic year, depending on your funding mechanism. This requirement is well below the upper limit of 6 hours per week, set by the research councils, and should therefore be workable within most PDRA’s own timetable. It should be noted that this level of activity does not attract additional payment.

However, should you volunteer for additional hours, or be invited to give a course or part of a course of lectures or part, you will be paid at the Department’s standard rates.

Contractual enquiries for postdoctoral staff should be directed to Ms Bonita Carboo (Senior Staffing and Communications Officer, email: b.carboo@ucl.ac.uk).

2 PERSON SPECIFICATION

The post holders will possess a range of general laboratory and computer skills, and will have demonstrated excellent computational and analysis abilities. The post-holders will have the ability to communicate effectively orally and in writing. The post-holders will also have the specific physics and mathematics skills required for each course.

Detailed job descriptions and contacts for further information are given in the section 5, and can be augmented by reference to our programme and course descriptions available at: <http://www.ucl.ac.uk/physics-astronomy>

3 PAYMENT

Payment will be received as appropriate on an as and when basis for work carried out during the academic year, which runs from October – September. Enquiries should be directed to Ms Nadia Waller (Postgraduate & Finance Administrator, email: n.waller@ucl.ac.uk).

- **Starting spine point and salary:** Grade 5 point 19, currently £13.97 per hour

3.1 How to ensure you are paid

Please note that you cannot commence work with the department until we have established your right-to-work and a contract has been set up for you. If you have worked before the date your contract has commenced, you may not be paid for the work. Your annual contract will usually commence on 01 October, however if you bring your paperwork in after this date, it will commence from the date that your passport is signed by the department.

In order for a contract to be set up with Physics and Astronomy (UCL) for the **current** academic year (October 2017 – September 2018), please bring the following documents to the Nadia Waller, Room E6:

- **Passport: We need to see your original passport**, to verify your right to work in the UK. We cannot accept copies. If you do not have a passport, other forms of ID are acceptable, details of which are given at:

http://www.ucl.ac.uk/hr/docs/download_forms/recruitment_selection_K.doc

Nadia will photocopy this upon seeing the original.

- **Bank account details: You will need to complete this form as this payment will go through the UCL payroll.** This is an entirely different system to Portico where stipend payments are made. The bank details form can be emailed to you by Nadia Waller (n.waller@ucl.ac.uk).
- **Starter Checklist (Tax exemption form):** If you wish to claim exemption from tax because you will be earning less than the threshold (approx £4,500pa), you should complete starter checklist:

<http://www.hmrc.gov.uk/forms/starterchecklist.pdf>

It is important that you complete it fully and provide your National Insurance Number (NINO). If you do not have a NINO, details on how to obtain one are available at:

http://www.ucl.ac.uk/hr/docs/national_insurance.php

4 TRAINING & DEVELOPMENT

Before undertaking any Teaching & Learning work within the Department, post-holders must have completed the mandatory UCL [Diversity training package](#) and

[Safety induction](#). You are also required to complete a [UCL Arena Gateway](#) training session.

We also recommend that you participate in the [UCL Arena One](#) scheme, which is a development pathway for postgraduate students and postdoctoral staff who teach (usually called PGTAs) at UCL, leading (optionally) to the submission of an application to become an Associate Fellow of the Higher Education Academy.

No prior teaching experience is necessary, but you will need to attend the Physics & Astronomy Teaching and Learning day on September 21st 2017. Additional mandatory module and task specific training will be provided to post-holders by the module or scheme coordinator.

Please note that before you can assess students' work, you have to be added as an [Assistant Internal Examiner](#) to the Departmental Board of Examiners. We will do this once you have completed the above training.

5 JOB DESCRIPTIONS & CONTACTS

5.1 Coursework Feedback and Assessment

You will be required to mark and provide written feedback for problem sheets, in-course assessments (ICAs) and other written assignments. These coursework assignments form part of the assessment for all of our lecture courses. Typically you will be asked to mark 20 - 40 sheets, and we aim to turn around work within 2 weeks from submission. Model solutions will be provided, and advice can be given on what courses are suitable for your expertise. **Contact:** [Prof Ruben Saakyan](#).

5.2 Python-based Computing Skills (PHAS1240, PHAS2441, PHAS2130)

You will need to have competent basic programming skills in Python (3.x) as well as familiarity with the Jupyter Notebook environment. During the sessions you will be helping and advising students with coding exercises and applying their physics knowledge to programming tasks. You will also be providing both verbal and written feedback to the students and assessing student work using a provided marks scheme. You will need to proactively engage students in discussion about their work, while being able to prioritise your time so that all the students receive the assistance they need.

PHAS1240: You will be teaching for one 3.5 hour session a week during the Autumn term (PHAS1240), on either Monday, Thursday, or Friday afternoons (2.00 - 5.30pm) [subject to timetable confirmation] for a total of 10 sessions. You may also be required to mark and provide detailed feedback on students' formal assignments, to be submitted in November and January. **Contact:** [Dr Louise Dash](#).

PHAS2441 & PHAS2130: You will be teaching for two 3.5 hour sessions a week during the first half of the Spring term, on either Monday **and** Tuesday, or Thursday **and** Friday afternoons (2.00-5.30pm) [subject to timetable confirmation] for a total of 10 sessions. You may also be required to mark and provide detailed feedback on students' formal assignments, to be submitted in March. **Contact:** [Dr Louise Dash](#) (2441), [Dr Filipe Abdalla](#) (2130).

5.3 Mathematica-based Computing Skills (PHAS1449, PHAS2443)

You will need to have programming skills in Mathematica (version 11). During the sessions you will be helping and advising students who will be completing exercises from problem sheets. You will need to proactively engage students in discussion about their work, while being able to prioritise your time so that all the students receive the assistance they need.

PHAS1449: You will be teaching for one 3.5 hour session a week during the Spring term, on Tuesday afternoons from 2.00 - 5.30pm, subject to timetable confirmation, for a total of 10 sessions. You may also be required to mark and provide detailed feedback on students' formal assignments which are submitted weekly for 8 weeks. Marking is in addition to demonstrating and therefore attracts extra payment. Session 10 is a formal examination and you will be required to invigilate. The position is a commitment to attend all 10 sessions and any briefings. If you will be unable to attend any sessions, you are expected to organise a suitable replacement with the necessary skills in using Mathematica. **Contact:** [Dr Jasvir Bhamrah](#).

PHAS2443: You will be teaching for one 3.5 hour session a week during the Spring term, for a total of 10 sessions. In addition to demonstrators in each session, we also need assessors and supervisors, who will be responsible for monitoring (from week 3 onwards) the progress of up to three students who are working on their programming miniproject, and for the first marking of their project reports and logbooks. Progress meetings should be initiated by the student, and you can expect to meet with a student typically up to 5-6 times during term. Exemplars of previous project submissions and marking schemes will be provided by the course coordinator. The position is a commitment to attend all 10 sessions and any briefings. **Contact:** [Prof Nick Achilleos](#).

5.4 Java-based Computing Skills (PHAS3459)

We need demonstrators for a third-year course on object-oriented programming in Java, with an emphasis on techniques appropriate for scientific computing. You will teach for one or two three-hour sessions during term 1, assisting students with their programming queries and providing guidance in proper programming technique and practice. Those demonstrators with significant Java experience will also be required to mark students' coursework in class and provide detailed feedback on the various elements that are being marked: a pre-defined rubric is used for marking each module to help achieve uniformity of grading between students.

Students attend two three-hour sessions each week, each normally beginning with a short lecture by one of the course coordinators, followed by students working through the associated piece of coursework. In total, the coursework makes up 25% of the final mark: the remainder is made of a mid-term exam (25%), held after Reading Week, and a final exam (50%) held at the beginning of term 2.

You will need to be confident with an object-oriented programming language: while experience of Java is highly desirable, it is possible to learn the Java syntax if you have enough prior experience with a related object-oriented programming language such as C++. **Contacts:** [Dr Ben Waugh](#) & [Dr Simon Jolly](#).

5.5 Laboratory Skills: Year One (PHAS1240, PHAS1241)

Prospective postgraduate demonstrators will need to have a desire to teach, and will be willing to help new undergraduates to excel. This will require a good background knowledge of general and practical physics, including mechanics for PHAS1240 and thermodynamics (and some electronics) for PHAS1241. New demonstrators will be given opportunities to gain experience of the experimental systems prior to teaching on the course. However, the focus of the course is to show students how to think differently about practical physics and teach them how to conduct themselves in a laboratory.

The postgraduate demonstrators will need to interact, proactively, with the students. They will undertake assessments of students via 'micro vivas'. Consequently, they will need to be good communicators.

PHAS1240: In this term 1 course students will conduct an initial (unassessed) experiment that is guided by a demonstrator. This is undertaken so that students can become familiar with the process of conducting experiments. Students will conduct

two 'main' experiments that will challenge how they see experimental physics at university level, when compared to what they have done before at 'A' Level (or equivalent). They will also conduct 'Skill of Hand' tasks that will introduce them to skills they will need in later courses. This work will be assessed by ongoing oral assessments and Moodle Quizzes. In particular, a 'Data Retrieval Test' Moodle Quiz will form the bulk of this experimental mark. **Contact:** [Dr Paul Bartlett](#)

PHAS1241: In this term 2 course, students work typically in pairs following scripts for the experiments. The experiments are of the same standard as those in the prerequisite course, PHAS1240. Great emphasis is placed on the formation of good habits in the keeping of a laboratory notebook for which the students are given detailed advice. **Contact:** [Dr Paul Bartlett](#)

5.6 Laboratory Skills: Year Two (PHAS2440, PHAS2441)

PHAS2440: This course is taken by second year Physics and Medical Physics undergraduates. Laboratory classes take place on Monday, Wednesday, Thursday and Friday mornings for 10 weeks in Term 1. In this course, the undergraduates undertake several investigations across a range of experimental topics. A team of demonstrators aid the running of the classes, typically consisting of two staff members, a PDRA demonstrator and a postgraduate demonstrator. Postgraduate and PDRA demonstrators will teach for a total of 10 sessions, typically for one 3.5 hour session per week. The demonstrator's role consists of helping undergraduates to solve problems whilst they carry out experiments in Teaching Lab 2, and encouraging students' best practice such as keeping a contemporaneous account of their observations and correct analysis of experimental data. Demonstrators are also expected to provide feedback on students' laboratory notebooks. An enthusiastic approach to practical physics and problem solving is essential. Demonstrators will be expected to engage with undergraduates in discussion about their work, and so good oral communication skills are vital. Demonstrators will not need prior knowledge of the specific experiments, as laboratory scripts and demonstrator's notes and training can be provided. **Contact:** [Dr Daven Armoogum](#).

PHAS2441: This course will run on Mondays, Tuesdays, Thursdays and Fridays in the second half of second term from Monday 19th February - Friday 23rd March. Demonstrators will help with a total of five sessions (one afternoon of 3.5 hours per week over five weeks) to be paid at the standard demonstrator rate. This is a practical project - full details of the digital thermometer electronics project will be provided in advance to demonstrators. The work will consist of going around the class helping students if they have problems, and also checking their lab books (check list provided). Demonstrators will also give mini-vivas to the students to check they have understood the project (sample questions and answers provided). **Contact:** [Dr Elinor Bailey](#).

5.7 Laboratory Skills: Year Three (PHAS3440)

The course is timetabled to run all day Monday and Thursday through term one and sessions are allocated from 9:30-13:00 or 14:00-17:30. Demonstrators will be expected to assist students in performing their main extended experiment as well as

marking and providing feedback on submitted work. They will also provide feedback to the students about their general performance in the lab and monitor attendance. The persons must have had some experience of working in a laboratory environment and have high quality inter-personal skills. **Contact:** [Dr Nick Nicolaou](#)

5.8 UCLO (Observatory) and Certificate of Higher Education in Astronomy

There are a number of course modules and activities at the [UCL Observatory](#) (UCLO) which are taught during the week in afternoon and evening hours (both terms). These courses span from basic notions of observational astronomy to data analysis and data reduction in the context of planets, asteroids, stars and galaxies.

These courses are delivered by senior teaching fellows Steve Fossey and Stephen Boyle, as well as Prof Ian Howarth and Dr Francisco Diego, who also rely on capable graduate students to demonstrate alongside. Course demonstration is an excellent opportunity to improve teaching skills as well as improve one's CV. The only priority criteria in course-demonstrator pairing is prior experience at UCLO for 3rd year modules. Training is offered for the operation of the Fry and C14s in September and early October. **Contact:** [Dr Giorgio Savini](#).

The Department also offers a part-time [Certificate of Higher Education in Astronomy](#). This course is made up of lectures (PHAS1515, PHAS1516, PHAS2525, PHAS2522), practical classes (PHAS1510, PHAS2520) and review essays (PHAS1513, PHAS2523): please see [Course Structure](#). There are opportunities to teach on all of these modules. **Contacts:** [Prof Jonathan Rawlings](#), [Prof Neal Skipper](#).

5.9 Communication Skills (PHAS1901, PHAS2901)

PHAS1901 and PHAS2901 aim to develop students' skills in getting their messages across, and in understanding the messages of others. These skills are crucial not only for being an effective physicist, but also in functioning effectively in many career – or non-career – situations. We need enthusiastic postgraduate students who are themselves excellent communicators, and who are able to advise and assess written and oral skills in a range of contexts. For written work assessment, demonstrators need to turn around within 2 weeks from hand-in. Full training is provided. **Contacts:** [Dr Cham Ghag](#) (1901) & [Dr Elinor Bailey](#) (2901).

5.10 Problem Solving Tutorials (PSTs)

All 1st-year and 2nd-year lecture modules will have associated Problem-Solving Tutorials (PSTs), to help students develop their problem solving ability and understanding. PSTs last one or two hours, and are not assessed, but attendance is expected as they do form an integral part of each module. During these sessions, students can ask for help on pre-seen problems while one or two instructors are on hand to give assistance. We are looking for postgraduate students to assist as tutors for these classes. The problems sheets will be provided in advance along with worked solutions, and a member of academic staff will be present also during the tutorial. **Contacts:** [Dr Stan Zochowski](#) & [Prof Neal Skipper](#).

5.11 Invigilation

All 1st-year and 2nd-year lecture modules will have associated in-course assessments (ICAs). Students complete these assessments under examination conditions, either in a large lecture theatre, or in a smaller rooms where we can accommodate students who have specific requirements. Invigilators should be trustworthy, and exhibit common sense, accuracy and attention to detail and strive to ensure the best possible examination experience for our students. They must be punctual and reliable. Duties include laying out stationery, observation, checking attendance, and collecting scripts. **Contact:** [Prof Neal Skipper](#).