UCL DEPARTMENT OF PHYSICS
AND ASTRONOMY

HEALTH & SAFETY HANDBOOK
Revision 19

SESSION 2022/2023

Also available at

http://www.ucl.ac.uk/phys/internal/staff/

http://www.ucl.ac.uk/phys/internal/student/

Introduction

1. About this handbook

This handbook exists to promote the health and safety of all personnel (staff, students and visitors) in the Department of Physics and Astronomy. Along with the RPR, this handbook is reviewed before the start of every term and is changed where required to ensure it is upto date with UCL safety policy.

It explains:

- their responsibilities towards health and safety
- the basic safety rules of the Department
- how special hazards are handled and activities organised

It also records:

- the management practices and arrangements of the Department that relate to health and safety
- the names of the personnel who have responsibility for health and safety
- the duties of the various officers.

2. Health and Safety Rules.

The rules set out in this handbook apply to all personnel of the Department of Physics and Astronomy and to any others working in the Department. Safety is your business. Never knowingly take risks or do anything that could put danger in the way of yourself or others. These rules are intended as a minimum standard. There are many other good practices specific to your area of work, which you should think about and follow. Accidents happen because no one thinks they will. Accidents result in loss, pain and distress. So always make safety your business. If you spot any potentially unsafe procedure or situation it is your moral duty to either put it right and/or report it to the Departmental Safety Officer, or Head of Department. You will never be penalized for being safety conscious.

3. You must

- Read this Handbook and be familiar with the rules set out in it, all of which are given for your safety.
- Understand the hazards of the area in which you are working and take all necessary precautions.

Know what to do if an accident or fire occurs.

- Attend courses arranged for your training in safety and the correct performance of procedure.

EMERGENCY NUMBER 222

Statement of Safety Policy for the Department of Physics and Astronomy

1. The Policy of the Department is to promote the safety, health and welfare of all its staff, students, visitors, contractors and members of the public on the Department's premises and to protect them elsewhere from any adverse effect on their health or safety arising from the activities of the Department.

2. The Department is committed to ensuring that risk assessments are carried out as required by the Management of Health and Safety at Work Regulations 1999 and other regulations. These risk assessments will be made by the staff responsible for the work, set out in writing and signed by the relevant manager or supervisor. No work is permitted to start unless it is covered by a suitable and sufficient assessment of the risks involved in the work.

3. The Department arranges for all work activities to be performed by persons competent to perform those activities (1). To this end, the Department is committed to ensuring that all members of the Department receive such training as required for them to be able to discharge their tasks and duties in a competent manner.

4. The Department arranges for staff activities and work activities to be supervised by competent people.

5. A person can only be competent in discharging a duty if they accept that duty, understand the responsibility of that duty and are allocated sufficient time to be able to discharge that duty.

6. The Department is a Department of University College London, and as such is responsible to the Provost for the implementation of the arrangements in the College Statement of Safety Policy

7. To give effect to this policy, the organisation and arrangements as described in this document have been approved and authorised by the Head of Department who has responsibility for the standard of safety within the Department.

8. It is a legal duty (2) for all staff, students and visitors in the Department to co-operate with the arrangements for safety set out in this document.

9. This policy is intended to reflect the current state of affairs within the Department. To this end, it will be revised upon any substantial change of organization or arrangements within the Department, and in any case, annually. This policy and its revision will be communicated to all persons affected by the activities of the Department.

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Appendices

1. DEPARTMENTAL STATEMENT.

1.1 Departmental Safety Statement.

In accordance with the Department's Statement of Safety Policy (see Appendix A) it is the aim of the Department to take all reasonable practicable steps to promote the safety, health and welfare of all College personnel, visitors and members of the public on College Premises. The Head of Department is responsible to the Provost in connection with all work done in the Department and for the carrying out of those duties of Heads of Departments specified in the Policy Statement.

A Departmental Safety Committee chaired by the Departmental Safety Officer (DSO) has been appointed to advise the Head of Department on the standard of safety, and to indicate areas where action needs to be taken. To do this, the DSO or a representative will inspect all areas of the Department at least once yearly and all teaching laboratories once a term. He/she will liaise with the College Safety Office to determine standards required by the Standing Committee on Safety and Security or by hazards of the work. Members of the Department should consult the DSO if they are concerned about the safety of any activity and should advise him/her as soon as every new and/or hazardous activity is planned. The DSO and the Departmental Safety Committee will routinely report to the Head of Department on every safety issue raised or dealt with on his/her own initiative (even if only to report that there are no issues). Urgent matters will be reported to the Head of Department immediately.

1.2 Duties of the Departmental Safety Officer

Procedures: To provide advice on, and check where appropriate, procedures to ensure the safety of operations within the Department.

Codes of practice: To ensure that the Department has an adequate statement in writing of its own safety policy and has created or adopted suitable codes of practice for the hazards associated with its activities e.g. control of access to chemicals, late working, handling of radiation sources etc.

Dissemination of information: To disseminate information on safety matters within the Department.

Hazards: To ensure that any special hazards in, or new hazards about to be introduced into, the Department are brought to the attention of the College Safety Officer.

Inspections: The most effective way of keeping abreast of change, alterations and overall standards within a Department is by means of regular inspections or audits of all areas and approaches. It is the responsibility of the Head of Department to ensure that the DSO has an effective system of regular inspections together with procedures for dealing with problems that are revealed by these inspections.

Records: To keep records of matters relevant to safety within the Department. Examples of records which should be kept are: relevant letters and emails and actions taken, accident investigations, Departmental inspections, certificates of inspection of items of plant, lists of staff with special responsibilities and on line records for accident investigations.

New Personnel: To ensure that new members of the Department, including students, are fully aware of College Safety Policy and standards as well as Departmental safety arrangements and procedures. All new staff and PhD students need to do a fire walk around and fill in a form TN086 which the DSO will keep.

Restricted Areas: To decide, after appropriate consultations where necessary, on any areas to which safety restrictions should be applied.

Maintenance Work: The College Maintenance Office operates a 'permit-to-work' system. For any laboratory or other hazardous area an authorized member of the Department must sign a permit-to-work. This must certify that conditions in the area do not present any foreseeable hazard.

Hazardous materials and Waste Disposal: To ensure that arrangements exist and are adhered to, for the safe use, storage, transfer and disposal of any hazardous materials and waste in the Department.

Occupational Health: to bring to the attention of Departmental staff the existence and availability of the College Occupational Health Service for consultation regarding any ill-health or health-related matters are arising from their work activity.

New Policies: To ensure that all members of the Department, including students, are made aware of new developments with particular reference to any change of policy procedure.

Safety Equipment: To ensure that first aid boxes are checked regularly by a member of the Department and that any deficiencies are reported and made good. Similarly to ensure that when any safety or fire equipment is seen to be missing or faulty, prompt action is taken to remedy the fault or deficiency.

Reports: To ensure that accidents are reported promptly in accordance with College procedures.

Fire Marshals: To arrange the designation and training by the College Safety Officer of Departmental Fire Marshals with the responsibility for ensuring prompt and complete evacuation of the building(s) when this is required.

Manufacture: To consult the College Safety Officer on any development, construction or provision by the Department of articles for use at work where there are problems of safety.

Training: The DSO has to deal with a wide range of subjects and some will be outside his/her own area of expertise. The DSO and other appropriate personnel will therefore need to attend appropriate courses and/or seminars to acquaint themselves with such areas and to keep up with current developments.

1.3 Duties of Academic and Supervisory Staff.

Individual members of Academic Staff have the duty of ensuring that students under their supervision comply with the rules of the Department and must initiate appropriate disciplinary action against students who refuse to comply, e.g. in the wearing of eye protection in workshops or in laboratories. During Student Experimental Projects an Academic Supervisor (or deputy) should be available at all times. In the event of alarm bells ringing, staff should ensure that students know of the need to leave the building and should direct them accordingly. Members of staff responsible for ensuring that the standards of safety in those rooms under their jurisdiction are kept to the standards set by the Department.

1.3a Risk Assessments: Principle Investigators (PI's) are responsible for safety in local areas. They are responsible for writing suitable and sufficient Risk Assessments for experiments and ensuring the RA's are distributed and signed by all members of the user group.

Risk assessments should be updated annually and upon any change of use.

1.4 Duties of all Departmental Personnel, Contractors and Visitors

It is the duty of all personnel to take reasonable care of their own health and safety and that of other persons who may be affected by their acts or omission at work. In furtherance of the aim, they are required to conduct their work within the requirements of the Department's Safety Codes of Practice and such other legal, College or Departmental requirements that are relevant to their work.

In particular, before any work is carried out, they should discuss the safety implications with their supervisor and ensure that they receive from him/her an appropriate Risk Assessment of any hazards associated with the work. Experimental procedures based on such assessments should not be materially changed without further discussion with the supervisor. No work with radioisotopes, ionizing radiation or lasers shall be started without first consulting the appropriate Specialist Safety Officer and obtaining any necessary authorization. The names and location of such officers can be obtained from your supervisor or from this document.

Before starting work in the laboratories, all personnel are required to read and make themselves familiar with the Department's Safety Codes of Practice and Risk Assessments are available in the laboratories and other areas to which they specifically apply.

Where any hazard or deficiency in safety arrangements is found, members of staff should, so far as is reasonably possible, take immediate action to remedy the deficiency. If this cannot be done, steps should be taken to prevent exposure of people to the risk; the DSO or Head of Department should then be informed.

1.5 People with Specific Safety Responsibilities

A Departmental Radiation Protection Supervisor and a Deputy Radiation Protection Supervisor have been appointed with duties specified in the College Radiation Policy Statement. Any work involving ionizing radiation must be referred to them before commencement.

A Departmental Laser Safety Supervisor has been appointed with duties specified in the College Laser Safety Code. Any work involving lasers must be referred to him/her before commencement.

The responsible persons register on RiskNet holds all duties and duty holders and is reviewed on a monthly basis and/or after a change of staff

A Departmental Electrical Safety Officer has been appointed to provide assistance in following Codes of Practice for electrical safety.

Trained Fire Evacuation Marshals have been appointed to assist in the evacuation of the buildings in the event of fire. Their duties are set out in the document "Duties of Fire Evacuation Marshals" obtainable from the College Safety Office, and given in the Appendix. A list of fire marshals is to be found in Section 2 of this Handbook.

Persons trained in First Aid have been appointed with each first aider assigned to a specific area in the Department. A list is to be found in Section 2 of this Handbook. All personnel with safety specific roles will be formally recorded in RiskNet using the Responsible Person Register which is reviewed and updated by the DSO before the start of every term.

1.6 Inspections

Annual safety inspections are carried out by Principle investigators (PI's) for their local areas and members of the Health & Safety Committee, (L.Bebbington, D Thomas, K.Vine, R Jawad) for specialized hazardous zones. Reports are issued on RiskNet and any necessary remedial action is referred to the relevant authority.

Monitoring and Audits

Inspection completion and mitigating action is audited by the DSO and DDSO which results fed into board meetings which are held quarterly

Improvement program

The department has a safety improvement program which can be found on the S Drive and is reviewed annually

2. PERSONNEL.

Management Structure:
The staff that have responsibility for Health and Safety arrangements in the Department are:

Title	Name	Telephone
Head of Department	Prof R Prinja	33475
Deputy HOD	Prof F Renzoni	37019
Safety Committee;		
Departmental Safety Officer and Chair	Mr L Bebbington	33445
Deputy Departmental Safety Officer	Mr K Vine	31552
Departmental Laser Safety Supervisor	Mr K Vine	31552
Departmental Radiation Protection Supervisor	Mr D Thomas	33446
Deputy Radiation Protection Supervisor	Mr K Vine	31552
Departmental Electrical Safety Officer	Mr Rafid Jawad	33414
Local Safety Officer – ULO	Mr Mick Pearson	020 8238 8886
Departmental Estates Liaison Officer	Mr L Bebbington	33445

Units or Departments
The Department is organised into 3 units. These units are:

UCL Physics Building		
Gower Street		
Unit Manager	Prof R Prinja	33475
Safety Advisor	Ms R Fairfax	58603
UCL Pearson Building Physics areas only		
Contact	Prof.Giovanna Tinetti	37160
Safety advisor	Ms R Fairfax	58612
Mill Hill Observatory		
Mill Hill		
Safety Officer	Mr Mick Pearson	020 8238 8886
Safety advisor	Ms R Fairfax	58612

UCL Safety Advisor
Ms R Fairfax r.fairfax@ucl.ac.uk, 58603
is the UCL Safety Office Representative assigned as the primary safety advisor to the Department.

Fire Evacuation Marshals

Senior Fire Evacuation Marshal:	Mr Lee Bebbington	Ext: 33445
Senior Fire Evacuation Marshal	Mr K Vine	Ext: 31552

Physics Building	(Zone 006)
Basement	Mr Rafid Jawad, , Dr Phil Jones
Mezzanine	Dr David Brooks.
Ground Floor	Mr Lee Bebbington, Lucy King, Lori Coletti-Campbell
First Floor	Mr Derek Thomas,
Second Floor	Mr Derek Attree, Mr Mark Sterling,
Third Floor	Mr Bernard Bristoll, Dr Phil Jones, Kelvin Vine, Emily Milner
Fourth Floor	Dr Dan Brown, Sergey Yurchenko Tania Monteiro
CoMPLEX	Nicky Townsend

North West Wing & Lewis Building
Mrs Kay Nakum, Prof Jonathan Rawlings, Dr Peter Doel, Dr Amelie Saintonge

UCL Observatory.
Mr Mick Pearson

First Aid Officers

Dr Pavlo Zubko	Basement	Ext: 39981
Dr David Brooks	Basement	Ext: 30459
Ms Lucy Keepking	Ground Floor	No: (0)20 3108 1408
Mr Simeon Bash	2nd Floor C17	
Mr Connor Godden	2nd Floor C19	
Mr Derek Thomas	Teaching Lab and First Floor	Ext: 33446
Mr Mark Sterling	Teaching Lab and Second Floor	Ext: 33455
Mr Kelvin Vine	Teaching Lab and Third Floor	Ext: 31552
Peter Doel	2nd floor Lewis Building	Ext: 65818
Patrick Guio	2nd Floor Lewis Building	Ext: 65820
Mr Mick Pearson	ULO	0208 238 8886
Ms Nicky Townsend	CoMPLEX	Ext: 59932

FIRST AID BOXES
PHYSICS BUILDING

Floor	Locations
Basement Floor (F)	F5, F8, F14, F10
Mezzanine Floor (M)	Corridor near toilets
Ground Floor (E)	Departmental Office (Room E15)
	Kitchen E3 / E7
First Floor (D)	Corridor, Lab 1, D25
Second Floor (C)	Corridor, Lab 2, C23
Third Floor (B)	Corridor, Lab 3; AMOPP Labs. (3)
Fourth Floor (A)	Corridor
Kathleen Lonsdale Building	Common Room
NorthWest Wing Building	Reception area 2nd floor

In Emergency Dial 222.

In case of Serious Emergency dial 9 999 and/or take patient to the Accident and Emergency Department at University College Hospital (UCH).

Display Screen Equipment Risk Assessors

Physics Building
Kelvin Vine
Tony Hoare
John Deacon
Lee Bebbington

NorthWest Wing Building
Kay Nakum

Observatory
Stephen Boyle

3. EMERGENCY INSTRUCTIONS.

3.1 Emergency Instructions for the Department of Physics and Astronomy, UCL Physics Building and Kathleen Lonsdale Building.

In the event of the outbreak of fire:

- Sound the fire alarm, or phone 222
- Evacuate Building

In the event of fire alarm sounding:

- Evacuate the building immediately
- Ensure any Persons under your supervision leave immediately
- Assemble at the assembly points marked on fire instruction notices

In the event of an emergency or serious accident:

- Phone 222
- Clearly state your location and phone number
- Clearly describe the nature of the emergency
- In the event of injury, obtain assistance from the nearest qualified first-aider

Minor accidents involving injury:

- Obtain assistance from the nearest qualified first-aider
- Phone Occupational Health Service [32802] for advice
- Escort the patient to UCH Accident and Emergency Department

3.2 Emergency Instructions for the Department of Physics and Astronomy Mill Hill Observatory.

In the event of the outbreak of fire:

- Sound the fire alarm and phone 9 999
- Evacuate the building

In the event of the fire alarm sounding:

- Evacuate the building immediately
- Ensure any persons under your supervision leave immediately
- Assemble at the assembly points marked on fire instruction notices

In the event of an emergency or serious accident:

- Phone 9 999
- Clearly state your location and phone number
- Clearly describe the nature of the emergency.
- In the event of injury, obtain assistance from the nearest qualified first-aider

Minor accidents involving injury

- Obtain assistance from the nearest qualified first-aider
- Escort the patient to Edgware General Hospital Accident and Emergency Department

4. SAFETY RULES AND ADVICE FOR EVERYONE

4.1 First Aid

Staff trained in First Aid are listed within the Department. Lists of these persons and the area in the Department in which they operate are given in this Handbook and posted in the laboratories and on the notice board on each floor. Make sure you know where they are. Locations of First-aid boxes are also given. In the event of a personal injury, particularly involving shock, their assistance should be sought as quickly as possible. Do not attempt to render first aid unless you have some competence in this matter. Help is always available on the number **222** on every internal phone. Help should always be sought by calling this number as soon as possible in cases of serious injury whether or not a trained First Aider is available. When telephoning for help you will be expected to give your name, the location of the injured person and the type of injury involved.

First Aid boxes are marked with a white cross on a green background. You should familiarize yourself with where they are kept.

4.2 Incident Reporting

Any accident or 'incident', including near misses, whether or not there are apparent injuries, must be reported by using UCLs RiskNet tool. **https://ucl-safety.co.uk/home/home.aspx**
The DSO will receive a copy back from safety services automatically
As required by law, serious accidents and incidents will be reported by UCL Safety Services to the Health and Safety Executive. Investigation and mitigation policy can be viewed in Appendix H

4.3 Fire

The most general hazard of which we must all be aware is that of fire and it is important that all should know what to do if it breaks out. There are notices posted throughout the Department setting out the procedure and drills are held regularly.

There are new regulations in force that make it compulsory for all staff , visitors spending more than 3 days working in the department and all post graduate students to have the following on joining the department and then annually thereafter or in the event of moving to a new location or building within the institution.

1 A physical walk of the fire escape routes.
2 Be able to operate emergency door release mechanisms
3 To be aware and able to operate safety shutdown procedures where necessary.
4 All of the above to fill in and sign UCL fire technical note TN086 and return it to the DSO for record keeping and inspection by the London fire brigade if required.

Full details are available at the following web address **www.ucl.ac.uk/fire**

IF A FIRE STARTS
Fire alarm klaxtons(two tone and very loud) will sound (the sounders also have a strobe light built in for the hard of hearing)in the appropriate building or Fire Zone.

If a fire starts near you, press the button of the nearest fire alarm point. (You should have familiarized yourself with their locations.)

The College is divided into numbered Fire Zones. Those in Physics and Astronomy are:

Zone 001 Kathleen Lonsdale Building.
Zone 002 Union Building, which includes the Massey Theatre on the ground floor.
Zone 006 The Main Physics and Astronomy Building

To assist in the complete and speedy evacuation of the department, trained fire marshals are appointed, each having jurisdiction over a small area of the building. It is their duty to ensure as far as possible, taking due regard to their own safety, that all personnel under their control leave their area speedily and safely. They must then report to the DSO when they are satisfied that their area is cleared. You must assist them in every way possible in carrying out these duties.

When the Fire Alarm sounds
You must evacuate the area at once in a speedy and orderly fashion. Make your way to one of the exits, via the nearest staircase which is free from smoke if you are on one of the upper floors.

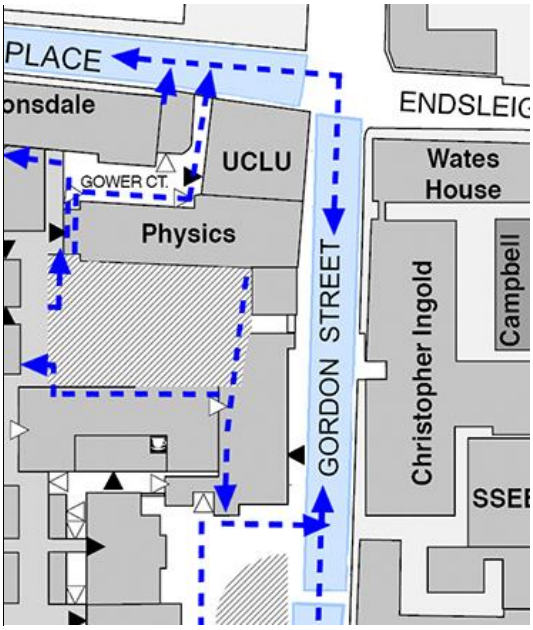
NEVER ATTEMPT TO USE THE LIFTS.

It is helpful if, before leaving the area, you can ensure that all windows and doors are closed but only if this can be done without detriment to your personal safety. Similarly, ensure that any equipment is switched off. Should the fire break out in your immediate vicinity, unless it is obviously very minor, you should not attempt to control it using the fire extinguishers that are prominent in all parts of the Department but rather inform a member of staff and raise the alarm. Immediate help may be summoned by dialling 222 on any phone. On leaving the Department you should make your way to assembly point F, the Physics Yard (Zones 001,002,006) or G, Gordon St. (Zone 002) or into Gower Place (Zone 001).

EVACUATION OF DISABLED PERSONS FROM THE PHYSICS BUILDING
Special arrangements apply to staff and students working in the Physics building who would have difficulty leaving the building by the stairs. This includes persons who may be temporarily disabled owing to illness or injury. Details are given on the UCL website please follow these links :-

UCL Fire team TN documents

If you would need help should the building need to be evacuated, please contact the DSO as soon as possible for further information.



Fire Zones and Fire Exits relating to the Physics Building. Four exits from the Physics Building exist:

- From the Ground floor into the Cloisters
- From the Ground floor into the yard outside of the Union
- From both ends of the basement area into the Physics Yard

To ensure the smooth operation of the system the College will from time to time hold fire drills, when the alarms will sound and you are required to follow the above procedure. You must co-operate fully in the drills.

Fire extinguishers are available on every floor, and come with different contents (clearly labelled); Water – for use on paper, wood, etc. NOT for electrical or solvent fires; CO2 – for electrical fires and general purpose.

All fires (however small) and any use of an extinguisher **MUST** be reported to the DSO or Supervisor who will contact the College Fire Officer so that the extinguisher can be replaced. Under no circumstances should fire extinguishers be used as doorstops.

Fire Prevention

All electrical equipment not in use should be switched off at the wall each evening and gas taps checked to make sure they are turned off. Doors should be closed at night and whenever a room is left empty for long periods.

Plugs that get hot, frayed cables, a slight smell of gas, etc, are all warning signs, and should be reported at once to the DSO. Keep corridors clear of combustible materials and clutter. Fire doors must not be left wedged open.

4.4 After Hours and Lone Working

Normal working hours are between 7am and 7pm weekdays. No hazardous experiments should be performed outside these hours unless approved by the Head of Department, the Lab PI and the DSO. If working out-of-hours, personnel (whether working in a laboratory or in an office) must inform the Lab PI and DSO.

No undergraduate students are to carry out experimental work unsupervised at any time. The rules for lone working by other personnel depend on the category (A, B or C) of equipment they are using. If you are unsure about the Category, discuss the matter with the DSO. No one may ever work alone if the work involves a significant hazard.

Category A; Normally Innocuous Equipment e.g. computer.

- Personnel may work alone at any time (subject to signing in)

Category B; Potentially Hazardous Apparatus e.g. high voltage supplies, lasers, vacuum systems

- During working hours, personnel should ensure that senior or experienced persons are in close proximity.
- Outside working hours, personnel are forbidden to work on their own without an adequate risk assessment.

Category C; Machine Tools

- At NO TIME must personnel use machine tools whilst alone.

4.5 Electrical Safety

The most general hazard arises from the use of all manner of mains powered electrical equipment. Every effort is made to maintain this to a high standard and all equipment is subjected to a yearly safety check. Each item should carry a "PASSED INSPECTION" label indicating the date when it was last checked. Occasionally a piece of equipment may be encountered which is not so labelled or carries a label indicating that the last test was carried out more than one year previous to the present date. Do not use the equipment but bring it to the attention of the qualified person who has facilities for carrying out immediate checks. Similarly, do not be tempted to use equipment that has evidently deteriorated or become damaged in use.

A. Visual Inspection: User Checks

Any user with basic electrical knowledge together with common sense could be regarded as competent to carry out the following simple checks:-

(i) Check that the equipment is suitable for its location and is being used for it's intended purpose as prescribed by the manufacturer

(ii) Check the mains lead for excessive wear and replace if necessary

(iii) Check that the lead is soundly connected at the apparatus end. In most cases it is impractical to remove the casing of a piece of equipment to verify that the internal connections are sound and that the cable is correctly clamped. All that is required is an external inspection to make sure that the cable is not obviously badly connected or poorly anchored.

(iv) Check that the mains plug is correctly wired and firmly clamped to the cable

(v) Make sure the plug is fitted with an appropriate fuse

(vi) Plugs in doubtful condition should be replaced. A newer and better type is now available from stores and should eventually replace all older types.

(vii) Do not use multi-way sockets connected to a single power outlet. Utilize a distribution board instead

B. The Formal Visual Inspection

At intervals determined by the apparatus and its usage, basic user checks should also be carried out in a more detailed manner by a qualified person with adequate technical knowledge. These checks should only be carried out by a person considered "qualified" by virtue of relevant experience, qualification or attendance at an appropriate training course. Such a person should know how to use the equipment correctly and how to interpret the results of any checks that are made. The Electrical Safety Officer can provide advice on the formal visual inspection.

C. Electrical Testing with Portable Earthed Appliances Tester (P E A T)

For this testing, greater knowledge is needed than for inspection alone.

(i) After passing the visual inspection a piece of equipment should be tested for adequate earthing and evidence of internal leakage current using a Portable Earthed Appliance Tester (PEAT). This may be borrowed from Mr Rafid Jawad the Electrical Safety Officer. The Electrical Safety Officer can provide answers to questions on its use.

(ii) The most frequently found faults are concerned with the earthing of devices. It is a general rule that any metal parts of a casting that could be rendered live by coming into contact with a wire or some other internal high voltage part under fault conditions must be earthed. This includes any screws which although holding a plastic housing in place may themselves project into the interior of the device. In general check all exterior metal parts and if any are found to be un-earthed, understand why this is the case before proceeding further.

Equipment that passes both tests must be marked with a sticker that should be affixed to the cable approx. 3-4" from the plug. Please put the date on them to avoid confusion with green stickers used in earlier years.

D. Double Insulated Equipment

Only **earthed** equipment can be inspected with a PEAT. Double insulated equipment (like modern VDU's and computers) should be visually checked only. Double insulation is denoted by a symbol on the equipment that shows two squares, one inside the other.

High voltage testing of such equipment can be dangerous and lead to severe damage, and should not be attempted.

Preventative Maintenance

Prompt maintenance (by competent people) of equipment that has failed inspection or testing, to correct minor faults before equipment failure, should be carried out.

Repair

The repair of failed equipment by competent, or, if necessary, specialist people (internal or external) should be carried out. Suspect or faulty apparatus should be taken out of use, put in a secure place, and labelled 'do not use' until attended to by a competent person.

Disposal

Irreparable equipment should be disabled by cutting off the mains leads, removed from the work place and moved to a recognized rubbish collection point.

Frequency of Inspection and Testing
Frequency of inspection and testing depends on the type of equipment and how it is used. Equipment involved in heavy-duty use, used in harsh environments, high current and with the potential to damage it, falls in a high-risk category and should be tested frequently. Extreme low voltage equipment and apparatus that is rarely moved may be inspected at regular intervals.

Electrical Safety at Work
The electricity at work regulations 1990 impose certain duties and responsibilities on us. An extract from the HSE guidance on Regulation 4, this being of most immediate relevance to this Department, is reproduced below.

Notes 6-9 refer to the need for regular inspection and testing of equipment to ensure its continuing safety and should be given the highest priority for attention. This involves checking that the safety elements included in the design of commercially supplied equipment continue to function effectively despite the routine wear-and-tear of its normal use.

Notes 2-5 have special implications for many Departments, and will require careful consideration. This will be in relation to the safety of experimental rigs of many different kinds. These will need to be adequately designed and tested "to prevent so far as is reasonably practicable, danger".

Regulation 4 (1)

1. Regulation 4 covers, in a general way, those aspects of electrical systems and equipment, and work on or near these, which are fundamental to electricity safety.
2. The word 'construction' in the regulation has a wide application. It may be considered to cover the physical condition and arrangement of the components of a system at any time during its life. It will include aspects such as design of the system and the equipment comprising the system.
3. In assessing the suitability for the construction of electrical systems, consideration should be given to all likely or reasonably foreseeable conditions of actual application or use of the electrical equipment in the system. This will include the testing, commissioning, operation and maintenance of the equipment throughout the life of the system.
4. In particular, consideration should be given to:
   (a) The manufacture's assigned or other certified rating of the equipment
   (b) The likely load and fault conditions
   (c) The need for suitable electrical protective devices
   (d) The fault level at the point of supply and the ability of the equipment and the protective devices to handle likely fault conditions
   (e) Any contribution to the fault level from the connected loads such as from motors
   (f) The environment and conditions which have a bearing on the mechanical strength and protection required of the equipment

(g) The user's requirements of the installation
(h) The manner in which commissioning, testing and subsequent maintenance or other work may need to be carried out.

5. The safety of a system depends upon the proper selection of all the electrical equipment in the system and the proper consideration of the inter-relationship between the individual items of equipment. For example, electrical protection against overloads and earth faults etc., may need to be provided in one part of a system to protect another, possibly remote part of the system. Also, where electrical energy is transformed or converted from one voltage to another, precautions should be taken to prevent danger arising from the lower voltage conductors becoming charges above their normal voltage.

Regulation 4(2)

6. Regulation 4(2) is concerned with the need for maintenance to be done in order to ensure safety of the system rather than with the activity of doing the maintenance in a safe manner, which is required by regulation 4(3).
7. The obligation to maintain arises only if danger would otherwise result. The quality and frequency of maintenance should be sufficient to prevent danger as far as is reasonably practicable.
8. Regular inspection of equipment is an essential part of any preventative maintenance programme. Practical experience of use may indicate an adjustment to the frequency at which preventative maintenance needs to be carried out. This is a matter for the judgment of the duty holder who should seek all the information he or she needs to make this judgment including reference to the equipment manufacturers' guidance.
9. Records of maintenance, including test results, preferably kept throughout the working life of an electrical system will enable the condition of the equipment and the effectiveness of maintenance polices to be monitored.

Regulation 4(3)

10. Regulation 4(3) requires that work activities of any sort, whether directly or indirectly associated with an electrical system should be carried out in a way which, as far as is reasonably practicable, does not give rise to danger.

4.6 Hygiene: Eating, Drinking and Smoking

Eating, drinking, smoking and the application of cosmetics are prohibited in all lecture theatres and all laboratories. Elsewhere, these activities must be confined to designated areas. No food or drink must be cooked or heated in laboratory equipment or kept in laboratory refrigerators, freezers or cold rooms. Always wash your hands after working in a laboratory.

It is illegal to smoke in any UCL buildings or within 10 meters of doorways and open windows.

4.7 Housekeeping, Tidiness and Inspections.

All personnel are responsible for maintaining the general safety and tidiness of their own offices, laboratories and other work places. This includes any apparatus for which they are in charge and the space it occupies. All members of the Department should exercise their common sense in terms of avoiding obvious health and safety hazards, such as trailing wires, unstable filing cabinets, accumulation of rubbish, especially of a combustible nature. Free circulation must be ensured in gangways, corridors and access routes to fire exits.

Emergency equipment (phones, first aid kits, fire extinguishers) should never be hidden or blocked.

Supervisors are expected to undertake (at least) an annual audit/inspection of their area(s) of responsibility to ensure compliance with Departmental Health and Safety Procedures. Safety audits of the Department are carried out regularly in collaboration with the Safety Office and Trade Union representatives.

4.8 Manual Handling; Loading and Unloading

Manual Handling of even relatively light objects should be avoided if possible; the risk of injury from incorrect lifting technique is high. Mechanical means should be used. Load must be assessed before handling with regard to size of load, distance of movement and personnel involved. If necessary, assistance must be sought. Staff are encouraged to attend the UCL Safety Office courses on handling which explain the safe manner of lifting heavy objects.

4.9 Protection

If the Risk Assessment for a particular hazardous substance or activity has determined that Personal Protective Equipment (PPE) such as Safety Glasses, Ear Defenders, Protective Shoes, Gloves, Face Mask, Lab Coat, is necessary before any work can be started, it MUST be worn.

4.10 Display Screen Equipment (VDUs)

Frequent use of DSE can present health problems for users. To this end detailed Risk Assessments for DSE have been prepared. A booklet “Working with DSE” published by the HSE is available from the DSO and the College Safety Office, and a pamphlet “Working with Display Screen Equipment” is available from Occupational Health and the DSO. Users are advised to obtain copies and read them.

There is a link to a self-assessment form for display screen equipment (www.ucl.ac.uk/hr/docs/download_forms/dseasses.doc)

We now have a team of trained "Display screen equipment risk assessors" to help staff with setting up a correct work area and advise on maters to do with seating position and posture and correct workspace management.

A full list of these can be found on page on page 10 of this booklet.

4.11 Security

Report suspected intruders using the College emergency number at once. NEVER attempt to confront them - they may be dangerous. Personnel should carry College identity cards at all times.

4.12 Pregnancy

In the event of pregnancy, female personnel are strongly advised to discuss the matter, in confidence, with the Head of Department, as some types of work (e.g. the use of radioactive materials or x-rays) should be avoided during pregnancy.

4.13 General Hazards

Personnel should use their common sense to maintain a safe environment. Never touch electric plugs or switches with wet hands. Inspect wires and cables on all electrical equipment for defects before using it. Report anything that appears hazardous to the DSO.

Unwanted or unlabelled chemicals can be deposited at the HAZARDOUS WASTE UNIT (note: not the compactor) in the Physics Car Park between 10am and 10.30am on any Friday. Contact College Safety Office in advance – see Section 6.53.

4.14 Co-operation Between Organizations

In buildings where there is multiple occupancy, prior warning and consultation concerning any activities that may affect the day to day working of other groups or Departments (e.g. movement of large equipment, work by contractors etc.) should be undertaken.

4.15 Resourcing for Safety Management

It is the duty of each supervisor to ensure sufficient resources are available for the provision of any necessary safety equipment and where appropriate the disposal of waste materials (e.g. radioactive sources, hazardous chemical and obsolete equipment).

5. SPECIAL HAZARDS AND ACTIVITIES: GENERAL RULES

5.1 Risk Assessment

A Risk Assessment must be carried out and submitted over RiskNet at least one month before any job, project or activity is undertaken (e.g. lab experiments, fieldwork and must include the summary residual risk level once control measures are in place). Risk Assessments should be circulated to personnel involved in the work for which they have been written, who should sign to confirm that they have been read and understood. Risk assessments can only be approved by a suitable senior member of staff (e.g. PI) associated with the activity.

All assessment control measures must be audited in situ by the approver on an annual basis or after any change of use.

COSHH Regulations:

The COSHH (Control of Substances Hazardous to Health) Regulations require that before the start of any research project, the risks involved must be assessed and a Code of Practice be drawn up by which the work must be undertaken. The research work must be carried out in order to minimise the risk. Any necessary training must be given. The research worker must follow that agreed code throughout the project and the supervisor is responsible for ensuring that this is done.

Before a project starts, the risk assessment for each research worker must be made on the appropriate form. Side one identifies the people involved and the place and nature of the work. If all the work is covered by the Codes of Practice outlined here, it will be sufficient for the supervisor to certify this on the second side. If any operations will be carried out which are not covered, a supplementary Code of Practice must be written to cover this and appended to the form. The form should be completed by the supervisor and signed by both him/her and the research worker. The supervisor and researcher keep one copy each, the third is held by the DSO.

The assessment must be revised at least annually and also if the nature of the project changes, or if unforeseen hazards are encountered.

It is necessary for each researcher to check on a day-to-day basis that the experiment he/she is about to carry out will fall within the agreed Code of Practice. It is the responsibility of the supervisor to ensure that this is done.

5.2 Laboratories

Laboratory safety is maintained by working to Codes of Practice, supplying information in written Risk Assessments, and making sure these are adhered to, and ensuring that competent personnel are in charge of high risk areas and carrying out safety inspections.

Safety of Maintenance Staff in Laboratories:

When calling out maintenance staff, whether by telephone or via a requisition or internal order, care must be taken to ensure that they are not exposed to hazardous conditions in a laboratory. If possible, anything hazardous should be removed from the vicinity but, if this is impractical, then the nature of the risk and precautions necessary must be explained to the workmen before they are allowed to begin.

The same consideration must be shown to maintenance staff from outside College, who should not be expected to work on contaminated equipment or be exposed to other dangers they are unable to detect or protect themselves against.

If maintenance staff have been sent for and a specific hazard is known to exist then the equipment or room concerned must be clearly labelled to warn of the hazard.

If in doubt about whether it is safe for maintenance work to be done, refer the matter to the Safety Officer or his nominated deputy.

The College now requires that a "Permit-to-Work" be signed by a member of the academic or Unit scientific staff before any maintenance work can commence. Members of staff should sign only for those laboratories with which they are involved. If such a person is not available then maintenance staff should be referred to the Safety Officer or Head of Department.

5.3 Workshops

Safety in workshops is the subject of the appropriate Risk Assessments and Codes of Practice. Use of the workshop equipment is restricted to workshop staff and other competent personnel who have had training in the use of the equipment.

Safety guards fitted to machine tools, laboratory apparatus and other potential hazards must never be removed, except in the event of a breakdown. If the removal of a guard is necessitated, all possible sources of the hazard must first be neutralized.

- No unauthorised persons are allowed in any of the workshops.
- No one may use the power equipment without permission and previous training.
- No one may use the power equipment without a second person being present, except with permission of the Safety Officer.
- Eye protection must be worn.

Good workshop practice must be exercised e.g. machinery adequately guarded, push sticks used where appropriate.

IN AN EMERGENCY: PRESS ANY OF THE EMERGENCY STOP BUTTONS TO HALT THE POWER EQUIPMENT.

6. Detailed Arrangements For Special Hazards And Activities

6.1 Abrasive Wheels

Abrasive wheels on Grinding Equipment must only be changed by approved personnel. The DSO holds a register of approved persons. Any damage or suspicion of damage to abrasive wheels must be reported immediately.

6.2 Accident Reporting

This must be done through UCLs RiskNet system on incident reporting link here
See also Section 4.2.

6.3 After Hours and Lone Working

A Signing in book must be signed by all people working after hours and at weekends. No one should work in the Department after hours without the knowledge of others, and permission from their supervisor. See also Section 4.4.

6.4 Building Maintenance Problems

All Problems associated with building maintenance should be notified to the Departmental Estates Liaison Officer, Mr. L.Bebbington and a record book should be maintained.

6.5 Building Works Within Department

The Project Officer will liaise with Head of Department, Bursar's Department, Safety Office and Contractors to ensure that any work is undertaken in a safe and correct manner.

6.6 Carcinogens

Use of Carcinogens will be detailed in the appropriate COSHH and risk assessments.

6.7 Chemical Safety

In accordance with COSHH and risk assessments, stocks of chemicals for use must be retained in a clearly marked and designated store. Chemicals present in the work area are subject to controlled usage.

Highly Reactive Chemicals

A variety of compounds are particularly corrosive, or may react violently with other chemicals. Such materials should be handled with appropriate containment, and cross-reactivity avoided: trays and sinks must be constructed from resistant materials, and chemicals of opposite reactivity well separated.

- Protective gloves, face protection and laboratory coats should be worn
- If corrosive compounds make contact with the skin, they should be washed off with large amounts of water, and medical aid sought.
- Strong Acids – Hydrochloric, Hydrobromic, Hydrofluoric, Sulphuric, Nitric, Perchloric, Trifluoracetic, are all very corrosive, and should be diluted from concentrated form by adding to water and not vice versa.

Flammable Chemicals
These fall into two broad Groups; those which can ignite spontaneously, and those requiring energy to ignite. The former should never be used without consulting the DSO. The latter is a large group of commonly–used materials, some of which are not fully appreciated for their flammable nature. Three parameters need consideration:

Flash Point; the temperature below which a substance cannot form a flammable vapour with air. The **lower** this is, the **more flammable** the substance.

Minimum Ignition Temperature; below this, the vapour cannot spontaneously catch fire in air. A distant source of heat above this temperature can cause 'flash-back' to the source of vapour.

Minimum Ignition Energy; this is the amount of energy required for ignition, for a given flammable mixture, at specific temperature and pressure. Safety requires that this is never reached by equipment nearby. Note that the ignition energy can be supplied by static, contact breaking/making etc, as well as flames and heat.

The following list of safety measures reflects these parameters:

- Flammables should not be used on an open bench
- No **naked flames** in the laboratory
- **No electrical apparatus** in the laboratory (sparks!) unless the chemicals are confined to an operating fume cabinet
- Avoid working alone
- All flammables must be stored in suitable containers and only the minimal quantities in immediate use should be out of the store. It should be closed when not in use.
- The stocks of flammables in any working area must be the minimum practical amounts in a given working area.
- Flammable materials must never be poured down the drain; consult the DSO concerning disposal of waste.
- Animal or other material contaminated with solvent residues must be stored in freezers unless they are marked as suitable (that is, having spark proof electrics).
- Fire-fighting equipment should be at hand.
- Solvent evaporation must not be carried out in unventilated electrical ovens; apparatus to be oven-dried should be washed out only with distilled water; beware of using ovens to regenerate silica gel etc. that has been in contact with solvent vapours.

Common Flammable Chemicals
Those listed have flash-points below 32º:
Acetone
Amyl acetate
Benzene
Ethanol (Absolute alcohol)
Ether (Diethyl ether)
Methanol

This is not an exhaustive list of substances that are covered by this code and neither does their inclusion imply approval of their use.

Poisons

- In any experiment involving poisons it is the responsibility of the member of staff in charge of the experiment, in consultation with the DSO to:
    a) Assess the hazard
    b) Ensure that suitable precautions are taken
    c) See that First Aid Procedures are understood
    d) See that any necessary equipment is available
- Designated poisons must be stored securely
- Notorious poisons (e.g. arsenic and cyanide) must be kept under lock and key
- Spillage or other accidents involving poisons must be reported to the DSO
- In the event of mercury spillage (or to dispose of unwanted mercury) report an incident on RiskNet and call 222. For more information goto https://www.ucl.ac.uk/safety-services/policies/2021/jun/mercury

Instructions in Case of Accidental Poisoning

- If the chemical has been confined to the mouth, give large quantities of water as a mouthwash (except in the case of Hydrogen fluoride). Ensure that the mouthwash is not swallowed.
- Do not induce vomiting as a First Aid procedure
- Arrange for transport to hospital. Provide information on the chemical swallowed to accompany the casualty with brief details of the treatment given and, if possible, an estimate of the quantity and concentration of the chemical consumed and the time elapsed since the emergency occurred.

Information can be obtained from:

Medical Toxicology Unit
New Cross Hospital
Avonley Road
London
SE14 5ER
Tel: 020 7955 5095
020 7771 5310

IN AN EMERGENCY PHONE 222 OR 9-999

6.8 Cleaning of Department

All problems are to be referred to Domestic Services on extension 37001 and the Estates Liaison officer, Mr Lee Bebbington (33445).

6.9 Compressed Gases and Gas Cylinders

Safety requirements and manufacturers' recommendations must be observed when using compressed gasses (e.g. for welding purposes). Adequate extraction must be present for the

removal of any noxious fumes. Only personnel with the necessary experience should change cylinders.

Gas cylinders are top heavy and can therefore cause serious crash injuries on falling. The contents at high pressure constitute a hazard, as a fracture of the cylinder head can convert a cylinder into a missile.

These hazards may not only affect the regular users of laboratories and workshops but also put at risk members of the emergency services if called upon to tackle fire in those places containing gas cylinders.

- In use or in storage, all cylinders must be secured adequately against falling. Large cylinders should be clamped to the bench; small cylinders can be either clamped or held in floor stands. Cylinders should be placed so they could be removed from the area if an emergency such as a fire occurs.
- Always use a trolley to transport a cylinder.
- Check the label and colour code before using a cylinder. Flammable gas cylinders are fitted with left hand thread connectors.
- Always use the appropriate connectors and regulators – the cylinder valve should not be used to regulate the gas flow.
- Cylinder valves or gas regulators must never be lubricated or greased. Never fit them or release them by hitting the valve with a hammer.
- Cylinders should be kept away from sources of heat and corrosion and the number of cylinders in a laboratory or workshop should be kept to a minimum.
- All cylinders must be turned off at the cylinder valve when not in use – this also applies to discharged cylinders.
- Cylinders of liquefied gases must always be stored in an upright position.
- Equipment newly connected to a cylindered gas supply should always be tested for leaks. These may be detected simply and safely by applying a dilute aqueous solution of washing up liquid.
- If rubber tubing is used it must be inspected for cracks or perishing and be securely attached.
- Excessive force must not be applied to valve spindles or regulator securing nuts. Cylinder valves should always be opened slowly, since sudden high pressures may produce immediate and considerable damage.
- If gas is to be delivered into a liquid, the regulator and cylinder must be protected against possible suck-back by a trap of adequate capacity.

ALL cylinder valve spindles have *right hand* threads.
NON-COMBUSTIBLE gas cylinders have *right hand* threads.
COMBUSTIBLE gas cylinders have *left hand* threads.

Liquid Nitrogen

Liquid Nitrogen boils at –196ºC and will cause damage to the eyes and skin. Do not use liquid nitrogen without prior consultation with an experienced member of the Department.

- Always protect your eyes with a face shield and wear insulated gloves when handling cold objects.
- In case of accidental contact, flood the area with cold water. If the skin is blistered, or the eyes have been affected, get immediate medical assistance.

- Considerable boiling and splashing will occur when transferring liquid to a container at room temperature. Cool objects and containers slowly minimise boiling and splashing.
- Check that the container you are using is suitable for –196ºC and will stand the thermic shock. Never use domestic vacuum flasks to hold or transport liquid nitrogen as they will explode if the liquid gets between the inner glass flask and the outer container.
- **Never stopper a vessel containing liquid nitrogen or** an explosion will result.
- Store and use only in well ventilated areas. Although nitrogen is non-toxic it can displace oxygen from the air.
- Anyone feeling groggy whilst working with liquid nitrogen should leave the area at once and get medical assistance if necessary.
- Never allow liquid nitrogen to stand for a long period in any container other than a Dewar flask intended for liquid nitrogen, as liquid oxygen can accumulate, presenting a fire hazard.
- Report damaged or malfunctioning equipment immediately.

Liquid helium
Similar precautions apply to the movement storage and use of liquid helium.

Solid Carbon Dioxide
Solid carbon dioxide slurries can give rise to severe blistering when in contact with the skin.

- Wear gloves and cover the block with a cloth when breaking solid carbon dioxide.

6.9.5 Transporting Liquefied and Compressed gases in elevators

Transport of compressed gases and liquefied gases in the elevators must follow the procedures detailed in the Departmental document "Instructions for transportation of compressed gases, liquid nitrogen and dangerous chemical in the Physics lift" (Appendix F). At no time can an elevator be occupied whilst such transportation is taking place - use the Tensa-barriers in the main Physics lift for preventing access.

6.10 Contractors

Contractors must report to the Estates Liaison Officer before commencing work and must work in a safe manner, observing safety requirements and any special instructions that may be necessary. This must be done in conjunction with the Bursar's Department and their rules for contractors. Project Officers for the works being carried out must be made known to the Departmental Estates Liaison Officer (Mr. Lee Bebbington).

6.11 Cryogenic Substances

Assessed protective equipment must be worn.

6.12 Dangerous Machines

By their nature of construction and operation, all workshop machines are potentially dangerous and must only be used by competent persons. All guards must be set in place when a machine is being operated and assessed protective equipment must be worn.

6.13 Departmental Safety Committee

Members are listed in Section 2. Meetings are held regularly and minutes taken.

6.14 Departmental Safety Committee Duties

To liaise between the Department, the Safety Office and Outside Authorities. To advise the Head of Department on standards of safety in the Department.
See Section 1.2 and Appendix B

6.15 Electrical Equipment Safety

All Portable electrical equipment (i.e. anything with a plug on it) must be maintained and tested regularly by competent persons, in compliance with the Electricity at Work Regulations, 1990. Staff are to be trained in the use of test equipment and the type of records to be kept. All portable electrical equipment and other electrical supplies and equipment must only be examined and maintained by authorised persons in accordance with electrical rules. If any such equipment does not carry a "Safety Test Notice" it should not be used and the DSO should be informed. See also Section 4.5.

6.16 Emergency Situations

The general emergency number is 222. In less immediate situations contact the appropriate safety person or the College Safety Office (ext: 46944). Contact Head of Department for appropriate action in extreme situations.

6.17 Field Trips/Location Work Safety

College policy must be followed; supervisors must have attended a Field Trip safety course. On location, local safety rules must be followed. Before departure, all personnel should read the green booklet "Safety in Fieldwork" obtainable from the DSO, and sign that they have read it.

6.18 Fire Safety

Fire points must be clearly marked, all extinguishers identified as to type and use and regularly checked. No staff should work in a manner that could lead to a risk of fire.

Fire arrangements must be posted on each floor. Detailed Fire Arrangements are set out in Section 4.3. A list of Fire Marshals is given in Section 2: Personnel.

6.19 First Aid

Nominated First Aiders and First Aid Equipment are present in the workshop and laboratory areas. Occupational Health (ext. 32802, 9.00am – 5.00pm, Monday – Friday) and, out-of-hours, UCL Hospital A & E facilities are located nearby buildings. A list of first aid Persons is posted on each floor and in teaching laboratories. See also Section 4.1. A list of trained First Aiders is given in Section 2: Personnel.

6.20 Fume Cupboards

Tested on a regular basis. Jobs must be risk assessed.

6.21 Health Monitoring

Health Monitoring is carried out by Occupational Health. Radiation badges must be worn as appropriate.

6.22 Housekeeping and Tidiness

The initial responsibility for the maintenance of standards compatible with the Health & Safety of themselves and others in terms of tidiness in an office lies with its occupants. All members of the Department should exercise their common sense in terms of avoiding obvious health and safety hazards, e.g. trailing wires, unstable filing cabinets, large accumulations of rubbish or detritus from eating and drinking.

6.23 Identification of Special Risk Areas (Laboratories, Workshops, Etc.)

All risk areas are identified with the appropriate signs. Entry into these areas is limited to the appropriate personnel.

6.24 Induction Arrangements

All new members of staff and research students must attend the UCL Induction Briefing course. All new personnel will be supplied with a copy of this Handbook and instructed to read it and be familiar with its provisions.

6.25 Laboratory Safety

Risk Assessments and general safety rules must be adhered to. See Section 5.3.

6.26 Laser Safety

All laser systems must be risk assessed an operational Codes of Practice drawn up. These should be approved by the Departmental Laser Safety Officer before operation commences.

6.27 Lifting Tackle

Must be inspected on a regular basis and test results and insurance certificate retained by the Estates Liaison Officer, Mr Lee Bebbington

6.28 Manual Handling

To be avoided, if possible mechanical means should be used. Loads must be assessed before handling with regard to load, distance of movement and personnel involved. Assistance should be sought. See Section 4.7

6.29 Microwave Safety

Required screening must be in place and tested for leaks. Do not use any metal containers, lids or aluminium foil in the cavity. Ensure that there is sufficient shielding.

6.30 Noise Safety

Monitor noise and reduce if necessary. Personal protective equipment must be assessed and used if necessary.

6.31 Occupational Health Service

Located in Building on Gower Place (ext. 32802) hours 9.00am – 5.00pm Monday to Friday.

6.32 Oxygen Depletion

Oxygen depleting substances must not be used where there is not adequate ventilation.

6.33 Permits to Work
Only those named on the permit to work are permitted to enter the work area.

6.34 Personal Protective Equipment (PPE)
PPE must be assessed before use. Equipment supplied must be worn and maintained in good order. Worn, damaged or inefficient equipment must be replaced. See Section 4.8

6.35 Pressure Vessels
These must be certified and inspected on a regular basis, written records and schemes of inspection are to be retained.

6.36 Purchasing Arrangements
Advice to be sought from the DSO before safety equipment is purchased.

6.37 Radiation Safety
All radiation sources and their uses must be approved by the Radiation Safety Officer (Mr Derek Thomas). Codes of Practice must be adhered to.

- No radioactive material may be brought into the Department whether by purchase, loan or gift without proper permission of the Departmental Radiation Protection Supervisor (DRPS).

- The names of all personnel involved in experimental work with ionising radiation must be given to DRPS the before any experiments are undertaken. Workers are expected to attend a radiation safety course.

- All closed sources must be made available to the DRPS for audit and wipe test purposes as required.

- Radioactive work may only be carried out in the designated Supervised Areas. Radioactive material must be stored in Supervised Areas only and not stored with any flammable liquids.

- Details of all new experiments involving ionising radiation must be given to the Departmental Radiation Protection Supervisor whose permission must be obtained before the experiments are commenced. All personnel involved must be familiar with safe methods for storage, handling, disposal, and dealing with accidental spillage of radioactive material, before starting work.

- Persons using certain isotopes are required to wear protective personal dose monitors (badges). These should be worn whenever radioactive material is handled and should not be taken out of the building unless to visit another lab to work with isotopes. These badges are changed each month and it is the responsibility of the individual concerned to see that their badge is available for collection and is replaced. If a badge is not returned

the worker concerned will automatically be assessed as having received a maximum dose and this could lead to their being unable to work with isotopes in the future. Any person working with radiation at another institution must ensure that the institution's Radiation Protection service provides dose records to the DRPS. The other institution's requirements regarding medical checks must be complied with.

- Disposal of radioactive material, whether by transfer or consignment to waste must be done by arrangement with the DRPS.

- These rules must be taken to cover all sources defined under the Radioactive Substances Act 1993 and also isotopes of Uranium and Thorium covered in Euroatom Regulations.

- The acquisition of X-ray sets must also be discussed beforehand with the DRPS

- A copy of the Local Rules regarding ionising radiations is kept in room E15. These can be consulted but not removed.

6.38 Record Keeping (Safety)
All safety records are kept on RiskNet

6.39 Risk Assessment
A Risk Assessment must be carried out on RiskNet before any job is undertaken. For any work to proceed, all Labs within the department must have valid, up to date risk assessment for the work being carried out and must consider all known risks. It is mandatory to consider fire risks and how your work affects overall fire safety for all assessments.

6.40 Safety Policy Distribution and Display
The Departmental Safety Policy will be freely accessible to all members of the Department, visitors, H.S.E and other authorities. Statutory Safety Policy information is also prominently displayed.

6.41 Safety Representatives
Union Safety Representatives are free to make recommendations and conduct inspections in all safety matters.

Smoking, Eating and Drinking
This is strictly prohibited in lecture theatres, laboratories, teaching or research labs. See also Section 4.6.
From July 1st 2007 it is illegal to smoke in any UCL buildings or within ten metres of doorways and open windows.

6.42 Soldering and Welding
Only qualified personnel should undertake such tasks. Procedures must be risk assessed. Adequate ventilation must be provided and protective equipment worn.

6.43 Spills Procedure

Spillage's should be reported to the DSO/Person in charge or cleaned up immediately.

6.44 Strong Magnets

These can be detrimental to the operations of pacemakers. Warning notices should be posted.

6.45 Supervision

Supervisors are responsible for those in their charge.

6.46 Training

The supervisor should assess safety training needs. A list of College Safety Courses is held by the DSO and displayed on the safety notice board. All bookings must be made through the DSO.

6.47 UV Safety

Assessed personal protective equipment must be worn. Short exposure to unfiltered ultra-violet radiation may cause severe and painful conjunctivitis and burning of the skin. Prolonged exposure may be carcinogenic. It is possible to incur severe damage without feeling anything at the time of exposure, or even without realising that a UV light id on in the room.

Any experiments involving unfiltered UV radiation must be cleared with the Departmental Safety Officer before they are set up. The light sources for fluorescent microscopes and fluorimeters are adequately shielded in normal use. However, these instruments present other hazards and it is essential to obtain instructions before using them. Do not remove the lamp housing without first consulting an experienced person. In changing the high pressure arc lamp it is essential to wear a fully protective face shield and heavy gloves.

Laboratory personnel and cleaners must be warned of any UV light being used to sterilise bacteriological and biological safety cabinets.

6.48 Unattended Overnight Experiments

Notice required on door listing the contact personnel and telephone numbers in case of emergency.

6.49 Visitors and Members of the Public

All visitors (including groups), members of the public and the contractors must report to Physics Main office on arrival.

All visitors spending extended periods in the Department should be made aware of the Emergency Procedures and where appropriate given a copy of the Departmental Health and Safety Handbook.

Visitors are the responsibility of their host who has a duty to accept responsibility for their actions, Safety and Security whilst in the Department.

6.50 DSEs and Office Safety

Regulations regarding DSE safety must be observed. Advice is available from Occupational Health and Safety Office and should be used. Good housekeeping practices should be used

in office areas to ensure a safe working environment. Work stations must be assessed before use. See also Section 4.9.

6.51 Stored Water Systems

Labs should avoid water temperatures and conditions that favor growth of bacteria such as legionella and other microorganisms. Keep temperatures in the safe range below 20oC or above 45oC. Never under any circumstance should a member of the department open a loop exposing themselves to cooling water (especially at pressure) without first ensuring all risks of exposure are reduced (such as wearing a face fit N95 mask). Any valves or filters should remain closed and only opened by trained personnel in full PPE.

Chiller breakdowns should be reported to the estates manager in a reasonable timeframe. Any dis-colourization noticed should be reported to the DSO immediately. All laboratory staff working with water systems should undergo legionella awareness training.

6.52 Warning Notices

A number of different types of hazard warning notices are available to identify particular sorts of hazard in the laboratory, e.g. Radiation Notice: Laser Notice: High Voltage Notice. If you encounter these notices in the laboratory then make sure that you fully understand the hazards involved, and the safety precautions necessary, before proceeding further. If in doubt, don't enter, and seek an experienced member of the Department.

6.52 Waste Disposal

For the disposal of Chemical waste send e-mail to **Lee Bebbington** listing the chemicals for disposal – if there is no response, contact Paul Monk on ext.32982. For non-hazardous waste disposal contact Domestic Services ext. 37001.

Disposal of Glass

Glass recycling bins are located underneath the arch at the bottom of Gower Court. All broken glass put into the domestic waste stream must be safely packaged.

Disposal of Substances Hazardous to Health

Particular emphasis should be given to:

(A) CARCINOGENS
(B) INFLAMMABLES
(C) EXPLOSIVE AGENTS

There are 3 normal methods of disposal of substances covered by the COSHH regulations:

- **Down the sink (after dilution with water or specific treatment)**
- **Incineration**
- **Sent to the chemical waste technician**

It is posed that, where feasible, the disposal method (1) should be down a designated sink with no catch pot. This is to ensure that our maintenance plumbers are **NOT** unwillingly exposed to hazardous chemicals.

It is essential that in the Risk Assessments, details of your disposal methods for substances hazardous to health be given.

Disposal of Solvent Waste

There are two main categories of solvent waste:

a) Non halogenated waste (in red drums)

b) Halogenated Waste (in yellow drums)

The system is that any solvent that is flammable and non-halogen is NOT disposed of into a halogenated waste drum since there is a strong likelihood of a various or violent reaction occurring. Reactive substances must be kept separate (bottled separately) labelled and disposed of through the College Waste Disposal System.

NB. It is important that all waste chemicals are labelled with an identifiable name, otherwise the disposal company will very likely refuse to take the material or else make a very high charge.

Workers from/in other Departments/Organisations

Such workers must be familiar with the local safety policy and adhere to it.

6.53 Workshop Safety

Safe working practices, good housekeeping and COSHH Risk assessment requirements must be observed to ensure that workshop safety is not compromised. Only trained personnel can use machines. See also Section 5.3.

6.54 Biological Agents

Working with biological hazards can only be undertaken after a risk assessment has been carried out. Contact Dr Q. Pankhurst on extension 33514 in the first instance. If he is not available, then contact the College Safety Office.

6.55 Office Work

Offices should be risk assessed annually or after change of either use or personnel.

6.56 New and Expectant Mothers

Managers must assess the risks to the health and safety of females of child-bearing age, pregnant women, new mothers and women who are breastfeeding.
The risks fall into four main categories: Physical, Biological, Chemical and Working environment

A new or expectant mother is a woman who is pregnant, has given birth within the last six months or is breastfeeding. 'Given birth' is defined as having 'delivered a living child or, after 24 weeks of pregnancy, a stillborn child

What you should do: Let your manager/supervisor know as soon as possible that you may be pregnant so that a review of the risk assessment for your work can be carried out
NB This does not constitute formal notification of pregnancy as detailed in UCLs Maternity Policy

More information and guidance for New and Expectant Mothers (previously pregnant workers) can be found **Here.** This guidance also includes a link to the UCL maternity policy

Appendix A

Statement of Safety Policy for the Department of Physics and Astronomy

Hereafter known as 'the Department'

Policy

10. The Policy of the Department is to promote the safety, health and welfare of all its staff, students, visitors, contractors and members of the public on the Department's premises and to protect them elsewhere from any adverse effect on their health or safety arising from the activities of the Department.
11. The Department is committed to ensuring that risk assessments are carried out as required by the Management of Health and Safety at Work Regulations 1999 and other regulations. These risk assessments will be made by the staff responsible for the work, set out in writing and signed by the relevant manager or supervisor. **No work is permitted to start unless** it is covered by a suitable and sufficient assessment of the risks involved in the work.
12. The Department arranges for all work activities to be performed by persons competent to perform those activities (1). To this end, the Department is committed to ensuring that all members of the Department receive such training as required for them to be able to discharge their tasks and duties in a competent manner.
13. The Department arranges for staff activities and work activities to be supervised by competent people.
14. A person can only be competent in discharging a duty if they accept that duty, understand the responsibility of that duty and are allocated sufficient time to be able to discharge that duty.
15. The Department is a Department of University College London, and as such is responsible to the Provost for the implementation of the arrangements in the College Statement of Safety Policy.
16. To give effect to this policy, the organisation and arrangements as described in this document have been approved and authorised by the Head of Department who has responsibility for the standard of safety within the Department.
17. It is a legal duty (2) for **all** staff, students and visitors in the Department to co-operate with the arrangements for safety set out in this document.
18. This policy is intended to reflect the current state of affairs within the Department. To this end, it will be revised upon any substantial change of organization or arrangements within the Department, and in any case, annually. This policy and its revision will be communicated to all persons affected by the activities of the Department.

(1) i.e. people who have the skills, knowledge and experience required to safely discharge a particular duty and who know the limits of their competence and seek advice when reaching those limits.
(2) Health and Safety at Work etc. Act 1974, Section 7.

Appendix B

Departmental Safety Committee

Lee Bebbington	Departmental Safety Officer	l.bebbington@ucl.ac.uk
Kelvin Vine	Deputy Departmental Safety Officer	k.vine@ucl.ac.uk
Kelvin Vine	Laser Safety Officer	k.vine@ucl.ac.uk
Derek Thomas	Dept. Radiation Prot. Supervisor	derek.thomas@ucl.ac.uk
Rafid Jawad	Dept. Electrical Safety Officer	Rafid.jawad@ucl.ac.uk
Lee Bebbington	Estates Liaison Officer	l.bebbington@ucl.ac.uk
Mick Pearson	ULO local safety officer	Michael.pearson@ucl.ac.uk
	MAPS workshop local safety officer	
Rachel Fairfax	Safety advisor (UCL)	r.fairfax@ucl.ac.uk

Responsibilities and Duties:

The Departmental Safety Officer (DSO) is authorised by the Head of the Department through the Departmental Statement of Safety Policy (DSSP), to ensure the day-to-day management of the Department Arrangement for Safety as approved by the Head of Department. (These tasks of management are not necessarily carried out by the DSO him/herself, but it is the DSO's duty to ensure that they are carried out and keep records of this.)

Owing to the size and highly technical nature of the Department, the office and duties of the DSO have been extended to a Safety Committee (co-ordinated by the DSO) which includes a Deputy DSO and Specialist Officers with particular responsibilities for radiation and laser safety.

It is the duty of the committee to:

1. Create or otherwise compile, disseminate and update the Departmental Arrangements listed in the DSSP, making use of recognized expertise and with advice and guidance from the College Safety Office via the Area Safety Officer.
2. Advise the HOD of any obstacles to creation, implementation or monitoring of these Arrangements.
3. Report on a regular basis to the HOD on safety issues.
4. Ensure that all accidents are reported to the College Safety Office and records kept.
5. Seek advice from the Safety Office where that advice is not available within the Department.
6. Identify Safety Training needs, ensure training is implemented, maintaining records.
7. Assist the Safety Office in investigation of accidents.

Notes

The DSO and Safety Committee are **not** expected to function as Safety Professionals, but to provide communications to the College safety advisor.

To adequately discharge their duties it may be necessary for Members to attend Safety Training Courses. The DSO and Committee should provide the HOD with brief written notes of all advice given and actions taken.

Appendix C

Department of Physics and Astronomy
Safety Committee

Constitution and Terms of Reference

1. The Committee will advise the Head of Department on all aspects of safety in the Department and ensure the day-to-day implementation of the Departmental Safety Arrangements, as listed in the Departmental Statement of Safety Policy (DSSP).
2. Membership will consist of a Chairman appointed by the HOD, who will normally be the Departmental Safety Officer (DSO), the Deputy Departmental Safety Officer, the Departmental Radiation Protection Officer, the Departmental Laser Safety Officer and such other members as determined by the Chairman in consultation with the HOD.
3. Members will serve for varying periods as determined by the Chairman, but the norm will be three years.
4. The Committee will maintain an overview of all matters relating to safety including:
   a) Creating or otherwise compiling, disseminating and updating annually the DSSP, including the Departmental Safety Arrangements, making use of recognised expertise, with guidance and advice from the College Safety Office via the Area Safety Officer.
   b) Advising the HOD of any obstacles to the creation, implementation or monitoring of these arrangements.
   c) Ensuring that all accidents and incidents are reported to the College Safety Office.
   d) Identifying safety training needs and ensuring that training is implemented.
   e) Assisting the Safety Office in the investigation of accidents.

   In carrying out these actions, the Committee Chairman will ensure that adequate Departmental records are kept and that the HOD is informed in writing of actions taken as appropriate.
5. The Committee will meet quarterly and its Minutes will be available to any member of staff who wishes to receive them.

Appendix D

Duties of Fire Evacuation Marshals

Building occupants need to be self-organising in order to manage emergency evacuations. This can be achieved by appointing Fire Evacuation Marshals (FEM). In addition to appointing two (FEMs) per floor, a senior FEM should be identified to assist and co-ordinate:

- Other FEMs in the building.
- The Fire Brigade.
- Security or Duty Electricians or Maintenance staff etc.

Principal Duties of Fire Evacuation Marshals:

- To take appropriate action if the fire alarm sounds, i.e. evacuate building.
- To assist in maintaining a "fire safe" environment for all building occupants.
- To report deficiencies with "fire safety" equipment or procedures through your Departmental Safety Officer (DSO), Departmental Administrator or Head of Department.

Normal Duties of Fire Evacuation Marshal:

- Periodically check that fire exits and escape routes are clear for use.
- Periodically check that the Fire Equipment in your area is in place and that the anti-tamper seals are intact (report deficiencies to the College Fire Officer ext 41240).
- Ensure that fire doors are not propped open.
- Ensure that supervisory staff in your area are aware of their duties in the event of an emergency evacuation.
- Ensure that staff in your area are aware of the evacuation procedure.
- Ensure that the Safety Advisory Unit is aware of any regular users of your area who may have difficulty leaving the building by the stairs.

Duties in the Event of an Emergency Evacuation

- Ensure the alarm has been raised, by operating the Fire Alarm Call Point and/or dialling 222 or 999 as appropriate.
- Check your area of responsibility requesting that occupants evacuate the work area, floor or building.
- Check or remind occupants that if hazardous processes are being used that they are safely shut down (as appropriate). The location of hazardous materials or processes should be reported to the Fire Brigade when they arrive.
- Report to the senior FEM or Fire Brigade Officer that your area has been evacuated (or not) as appropriate on leaving the building.
- Proceed to the Assembly Point, moving occupants with you.

APPENDIX E

EVACUATION OF DISABLED PERSONS FROM THE PHYSICS BUILDING

Special arrangements apply to staff and students working in the Physics building who would have difficulty leaving the building by the stairs. This includes persons who may be temporarily disabled owing to illness or injury. Details are given on the UCL website please follow these links :-

http:www.ucl.ac.uk/edf/maintenance/fire/documents/UCLFire_TN_008.pdf

http:www.ucl.ac.uk/edf/maintenance/fire/documents/UCLFire_TN_009.pdf

If you would need help should the building need to be evacuated, please contact the DSO as soon as possible for further information.

Handbook/Safety arrangements review schedule: The department will review this handbook annually with reference to UCL safety policy before the start of every term.

Appendix F
Department of Physics and Astronomy

Instructions for transportation of compressed gases, liquid nitrogen and dangerous chemicals in the Physics lift

Golden rules

When transporting potentially dangerous substances in the Physics lift:

1. **Read and understand the Material Safety Data Sheet(s) for the substance(s) concerned. Pay especial regard to information regarding transport and ensure that suitable packaging and/or unbreakable containment vessels are used.**
2. **Never ride in the lift with the substances.**
3. **By utilizing the Tensa-barriers, prevent other people getting in the lift**

Transporting of potentially dangerous substances in the lift should always be a two-person operation with one person stationed at the destination floor in addition to the person loading the goods in to the lift. The procedure to follow is:

1. Collect a lift over-ride key from either the Departmental Administrator or the Estates Liaison Officer
2. Call the lift to the floor where chemicals are to be loaded into the lift
3. Over-ride general use of the lift using the over-ride key
4. Put substances in to the lift
5. On BOTH doors to the lift, pull out the Tensa-barriers
6. Select the floor to which lift is to be sent
7. Exit the lift before the doors close
8. When lift reaches the destination Floor, partner then
    1. Unclips the Tensa-barriers
    2. Removes goods from the lift
    3. De-activates the lift over-ride
    4. Returns the lift over-ride key.

Appendix G
Departmental Safety Inspections and monitoring

Safety monitoring is a process which allows the department to identify potential issues before they result in incidents/accidents or ill-health and involves:

- visits, checks and inspections of the workplace, equipment and plant will take place at a specified frequency according to the risk rating of the space being monitored

Our safety monitoring programme provides information on:

- the effectiveness of risk control measures implemented as a result of the risk assessment
- work conditions or practices which introduce new hazards
- risks due to non-compliance with previously agreed risk control measures

Inspections must be carried out by competent persons on RiskNet who are familiar with the risks, locations and hazards being monitored and is authorised to take remedial action. PI may delegate this to an appropriate member of staff (such as a PDRA)

High Hazard Areas (3) such as Laser Labs should be inspected every 2 months whereas Low hazard areas (1) such as offices can be inspected annually. Spaces denoted as medium hazard (2) should be inspected biannually

Results and Findings from inspections must be communicated to the Lab PI or area supervisor and acted up with an agreed target date for completion.

A full program of inspection monitoring is available

Appendix H

Incident investigation and escalation

The department is responsible for investigating all accidents and incidents so we can:

- Ensure action is taken to prevent a recurrence
- Meet statutory requirements (Under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR 2013) the University has a statutory obligation to report certain types of incidents and accidents to the Health and Safety Executive (HSE). All reports to HSE are made by UCL Safety Services)
- Help monitor and improve health and safety performance
- Provide information for responding to claims made against UCL
- Enable UCL to respond quickly and accurately to external enquiries

Accident investigation is primarily the responsibility of the principle investigator unless a local investigation is warranted by the risk and severity metric then the DSO/DDSO may also conduct an investigation.

The department has an appointed Incident coordinator. (Lee Bebbington DSO and Kelvin Vine DDSO). This is an administrative role that receives an email every time an incident is reported within their department. The Incident Co-ordinator will assign the incident to the person who will review the incident based on the following criteria.

- For incidents that cause, or have the potential to cause, injury or ill-health to an individual, the manager of the involved/injured person (IP) must be involved in the investigation
- For all incidents including those where there no injury or ill-health is suffered and no particular individuals are involved, the manager or responsible person in charge of ensuring the activity is carried out safely should lead the Initial Assessment and be involved in any further investigation. This could be the PI or the person responsible for the area such as the lab manager.
- All investigations should be carried out by competent investigators who have undergone sufficient training in accident investigation.

The Head of the Department and the Departmental Safety Committee will ensure that incidents are investigated and are recorded along with lessons learned on riskNET.

Local and full investigations

There are 2 types of further investigation that a department may open. riskNET provides a framework for the investigator to ensure that all aspects of the investigation are covered and recorded.

Once an investigator has chosen to open an investigation they can assign additional people to help with the investigation. These could be the Departmental Safety Officer, the line manager of people involved or the supervisor of the areas where the incident took place. It may also involve people from other departments.

For incidents with known high potential risk, the specialist from Safety Services should be part of the team. For example, incidents that require further investigation, the Biological Safety Officer (BSO) should be added to the team.

Local investigation

This is most common form used by UCL this can be opened by any investigator.

Full investigation

This requires agreement with the Head of Department and Safety Services to open. It may be required in the cases where a RIDDOR report has been made or where the incident and therefore the investigation may have consequences across UCL. If riskNET prompts or the investigator believes a full investigation is necessary, you should contact the lead advisor for the department as soon as possible

Communication

Once incidents are investigated a report is submitted on risknet with lessons learned. A communication of the summary of these lessons will be included in the departmental newsletter and where appropriate, senior group board meetings.

Lee Bebbington — Departmental Safety Officer

Prof. Raman Prinja — Head of Department