Key Contacts

Emergency Telephone Numbers

<table>
<thead>
<tr>
<th></th>
<th>Room</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire, Ambulance, Police</td>
<td>111</td>
<td>6402</td>
</tr>
<tr>
<td>Campus Security</td>
<td>6111</td>
<td>6400</td>
</tr>
</tbody>
</table>

Doctor (Health Centre) 6402
Works and Services 6400

Departmental Safety Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Room</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steve Maddox</td>
<td>Chair</td>
<td>6208</td>
<td></td>
</tr>
<tr>
<td>Cliff Franklin</td>
<td>Designate</td>
<td>7611</td>
<td></td>
</tr>
<tr>
<td>Graeme Plank</td>
<td>Safety Rep</td>
<td>7586</td>
<td></td>
</tr>
<tr>
<td>Rob Thirkettle</td>
<td>Field Station Rep- Cashmere Cavern</td>
<td>6510</td>
<td></td>
</tr>
<tr>
<td>Graeme Plank</td>
<td>Field Station Rep- Birdlings Flat</td>
<td>7586</td>
<td></td>
</tr>
<tr>
<td>Tim Delany</td>
<td>Safety Rep</td>
<td>7508</td>
<td></td>
</tr>
<tr>
<td>Nigel Frost</td>
<td>Field Station Rep- Mt John</td>
<td>2707</td>
<td></td>
</tr>
<tr>
<td>Sharelene Mullen</td>
<td>Administrator</td>
<td>6404</td>
<td></td>
</tr>
</tbody>
</table>

Staff holding First Aid Certificates

<table>
<thead>
<tr>
<th>Name</th>
<th>Room</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cliff Franklin</td>
<td>303</td>
<td>7611</td>
</tr>
<tr>
<td>Graeme MacDonald</td>
<td>209</td>
<td>6583</td>
</tr>
<tr>
<td>Graeme Plank</td>
<td>809b</td>
<td>7586</td>
</tr>
<tr>
<td>Orlon Petterson</td>
<td>211a</td>
<td>6707</td>
</tr>
<tr>
<td>Wayne Smith</td>
<td>206</td>
<td>7609</td>
</tr>
<tr>
<td>Robert Thirkettle</td>
<td>106</td>
<td>6510</td>
</tr>
</tbody>
</table>

Building Warden

<table>
<thead>
<tr>
<th>Name</th>
<th>Room</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wayne Smith</td>
<td>206/208</td>
<td>7609</td>
</tr>
</tbody>
</table>

Floor Wardens

<table>
<thead>
<tr>
<th>Level</th>
<th>Name and Designated Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Robert Thirkettle, Graeme Kershaw</td>
</tr>
<tr>
<td>2</td>
<td>Graham MacDonald, Geoff Graham</td>
</tr>
<tr>
<td>3</td>
<td>Cliff Franklin, Lab Supervisor on duty</td>
</tr>
<tr>
<td>4</td>
<td>Lab Supervisor on duty</td>
</tr>
<tr>
<td>5</td>
<td>Paul Broady, R. Gardiner</td>
</tr>
<tr>
<td>6</td>
<td>Jon-Paul Wells, Mike Reid</td>
</tr>
<tr>
<td>7</td>
<td>XueFeng Liu, Roger Reeves</td>
</tr>
<tr>
<td>8</td>
<td>Graeme Plank, John Hearnshaw</td>
</tr>
</tbody>
</table>

All staff and graduate students must assume the role of floor or building warden in the absence of the designated persons.
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A. DEPARTMENTAL SAFETY RULES

1. Students and staff must wear safety glasses and laboratory coats in laboratories and workshops except for those areas which have been officially exempted from this requirement.

2. Proper footwear must be worn in all laboratories and workshops. The whole foot must be protected and non-skid soles are recommended.

3. Smoking is prohibited in the building.

4. Eating and drinking in laboratories is prohibited.

5. Work with hazardous or toxic materials must not be undertaken without proper precautions. If any doubt exists consult your supervisor or the Department Safety Officer.

6. All accidents must be reported to the Department Safety Officer immediately. This is particularly important when the circumstances leading to the accident are likely to recur. Acquaint yourself with the first aid equipment provided.

7. FOR MEDICAL ATTENTION PHONE STUDENT HEALTH SERVICE (EXT. 6402). IF NO REPLY DIAL 111.

8. No staff or students are permitted to work in an office, laboratory or workshop with the major access door locked.

9. Undergraduate students are not permitted to work in class laboratories outside the prescribed hours.

10. No student or staff is to carry out experimental work in a laboratory unless a second person is within call. No student is to work in a laboratory after 11 p.m. without written permission from a supervisor.

11. LPG Isolation valve switches are to be turned off by the last person to leave a laboratory, after having first checked that all gas taps are closed. This should be attended to at the end of each day and particularly in the event of emergency evacuations.

12. No undergraduate is to leave an experiment running overnight without obtaining permission from a supervisor. Graduate students who find it necessary to run such experiments are expected to take all reasonable precautions, and should always consult their supervisor. An “Operating Equipment” card is to be displayed beside the equipment and at the doorway to the laboratory.

13. Corridor doors and windows must be kept closed outside normal working hours. You are expected to ensure that after 6.00 p.m. and during weekends or holidays the entrances to individual floors, and all ground-floor windows are kept closed.

14. Students are not permitted to carry out electrical wiring on mains powered equipment or extension cords. These tasks should be referred to the electronics workshop. Students may be allowed to work unsupervised on laboratory equipment supplied up to 32 volts DC or 50 volts AC or at higher voltages under the direct supervision of competent staff.
Safety Induction

1. All members of staff and graduate students are expected to have completed the Safety Induction exercise available on the Learn website (http://www.learn.canterbury.ac.nz/).

2. All new members of staff or graduate students should complete this exercise as soon as possible after their arrival in the department.

3. All contractors working in the Department, and who are not covered by other university health and safety inductions, should visit the Departmental Administrator in room 708 Rutherford as their first port of call to receive a Health and Safety induction briefing.

4. Area Champions (e.g. lab supervisors, etc) should ensure that all staff, students and visitors to their areas are made aware of health and safety procedures and standard operating procedures within those areas.

5. All first year students doing Physics laboratories are to receive a Health and Safety briefing as part of their first laboratory session, and should sign the attendance sheet to show they have received that briefing.
B. GENERAL INFORMATION

1. **Keys and work outside normal departmental hours**
The main doors of the Physics and Astronomy Department and corridor doors are kept closed outside the hours of 8.00am and 6.00pm Monday to Friday, with some corridor doors on teaching laboratory floors locked at all times except when laboratories are operating. Research workers and students must consult with the Head of Department (Room 710, Ext. 6541) before collecting their keys or cards from Registry. Students should refer to Section E and A.11 for the conditions under which experimental work may be carried on outside normal working hours. Outside normal working hours access cards must be carried.

2. **Cryogenics**
LN$_2$ available from Cryogenics, 1st floor. See Bob Flygenring (Room 114, Ext. 7512).

3. **LPG (Liquefied Petroleum Gas)**
LPG reticulated through pipes in the building for use in LPG burners. It should be noted that LPG itself is odourless and because of this an odorant (ethyl mercaptan) is added in trace amounts so that gas leaks will be noticed. (Familiarise yourself with this odour). LPG is heavier than air and could therefore accumulate on floors, sinks, drains, etc in explosive mixtures with air. For this reason all laboratories provided with LPG have individual solenoid-controlled isolation valves. When the indicator light (both on the switch by the laboratory door and in the corridor outside) is on the isolation valve is open. Whenever LPG is not in use or when the laboratory is vacated all isolation valves must be switched off (lights off - valve closed)

4. **Equipment maintenance**
All electrical equipment must be kept in a clean usable condition and not left in fume cupboards.

Regular inspection of electrical equipment is required by law, if you find any equipment to be faulty, immediately unplug and label the equipment as faulty and notify Electronics Workshop (room 207A/209, Extn 6583). Any portable equipment without a safety sticker should be bought to room 209 to be checked. This includes any equipment bought into the Department by individuals.

Equipment such as magnetic stirrers - hot plates, heating mantles, balances, ovens, vacuum pumps requiring servicing should be reported to Wayne Smith (Room 206.208, Ext. 7609), Graeme Kershaw (Room 106, Ext. 6510).

5. **Breakdowns in services**
Breakdowns should be reported to Graeme Kershaw (Room 106, Ext. 6510). In his absence serious breakdowns should be reported to Works & Services (Ext. 6400) or to Security (Ext. 6111). Lift breakdowns should be reported to Security (Ext. 6111).

6. **Use of special equipment**
Students who need to use some of the Department's special equipment must first consult their supervisor. He/she will refer the student to the staff member who is responsible for the instrument. In no case should a student begin to use an instrument without a clear understanding of the operating procedure.
7. **Material Safety Data Sheets, Chemical Databases, and Health and Safety Information**

8. **Other services and facilities**
   There are Ethernet connections to the University network via computers in Room 817. EMAIL facilities are available.

   **Photographic services**: Cliff Franklin is the person to contact regarding the Department’s digital camera (Room 303, phone 7611).

   **Photocopying**: Private photocopying charges are posted by the photocopier. Money for private photocopying should be given to the Departmental administrator.


9. **Leaving apparatus on overnight**
   a) If electrical apparatus, on the approval of a staff member, needs to be left on overnight in research labs an “Operating Equipment” card must be displayed beside the equipment. These cards are available from Room 705.

   b) Electrical equipment not required for immediate use should be switched off. Computers with power saving features may be left switched on.

10. **Procedure when research work has been completed**
    Once bench work has been completed students in consultation with their supervisor must:
    
    - Clean up their laboratory work bench including fume cupboard.
    - Return chemicals and glassware to the store, Room 613.

11. **Chemical Store**
    There is a small chemical store in room 625, associated with the RF Furnace. Instructions on the door must be followed at all times, and the door must be kept locked at all times.
    Refer to Appendix D.

12. **Nuclear / Radiation**
    See Appendix E.
C. EMERGENCY PROCEDURES

1. FIRE

Fire is one of the greatest potential hazards in the building and every effort should be made to avoid the possibility of starting a fire. Examples of hazards include: bunsen burners left on; water baths running dry; electrical equipment in poor maintenance; and lack of precautions when handling flammable solvents.

The building is protected by an Automatic Sprinkler Fire Alarm System. If an outbreak of fire was serious it would activate the ceiling sprinkler head above the fire, releasing a continuous spray of water, it would also activate the fire horns and automatically notify the Fire Brigade.

   a) Small Fire Emergency

Prompt action will often prevent a small fire from becoming a major disaster, e.g. smothering the flames with a wet towel or even a notebook, and the use of the correct type of portable fire extinguisher, are very effective.

Any person becoming aware of a small fire which has not activated the automatic fire detection system, should raise the alarm by operating the nearest alarm and ringing emergency number 6111. Operate a fire extinguisher only if it is safe to do so.

If the situation does not respond to "first aid" fire fighting methods, close the room doors, warn others by shouting an alarm and leave the immediate area.

   b) Fire Extinguishers

The following types of fire extinguishers are installed throughout the buildings. Everyone should be familiar with their proper use.

<table>
<thead>
<tr>
<th>TYPE AND LOCATION</th>
<th>COLOUR</th>
<th>TO USE</th>
<th>USE AGAINST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Powder; in high risk areas</td>
<td>Red with white band</td>
<td>Remove pin or break seal, squeeze handle</td>
<td>General purpose, especially solvent fires</td>
</tr>
<tr>
<td>CO2 Gas; throughout</td>
<td>Red with black band</td>
<td>Remove or break seal squeeze handle</td>
<td>General purpose, especially electrical fires</td>
</tr>
<tr>
<td>Hose Reels; 2 per corridor</td>
<td></td>
<td>Turn on stop valve, turn nozzle and control water flow</td>
<td>Paper, rubbish, wood</td>
</tr>
</tbody>
</table>

i) Used extinguishers. When an extinguisher has been used, immediately notify the departmental administrator who will arrange to have it recharged. A used extinguisher should be laid on its side on the floor.

ii) Blankets are provided in the storeman’s office (in the loading bay). They could be used for smothering the flames when a person's clothing is alight. Do not roll a person in a blanket if clothes are alight as the blanket could act as a chimney and divert the heat and smoke towards the face.
2. CHEMICAL HAZARDS

a) If you have a major spillage, a cylinder or apparatus leaking a hazardous gas or a reaction that has become potentially explosive or any such sudden emergency immediately contact one of the following persons for advice on what to do.

<table>
<thead>
<tr>
<th>Name</th>
<th>Room</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graeme Kershaw</td>
<td>106</td>
<td>6510</td>
</tr>
<tr>
<td>Cliff Franklin</td>
<td>303</td>
<td>7611</td>
</tr>
</tbody>
</table>

b) All preparations and chemical operations which constitute a significant hazard must be carried out in the room on the sixth floor designed for such purposes (Room 613) in the Physics Department.

c) Emergency life support units are available on all floors. Breathing apparatus, located on level 1 of the Chemistry Department, are to be used only by those qualified to do so.

d) There are handheld (H/H) and eyewash stations (E/W) in the following rooms:

<table>
<thead>
<tr>
<th>Room</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>106</td>
<td>E/W</td>
</tr>
<tr>
<td>107</td>
<td>H/H</td>
</tr>
<tr>
<td>116</td>
<td>H/H</td>
</tr>
<tr>
<td>117</td>
<td>H/H + E/W</td>
</tr>
<tr>
<td>208</td>
<td>H/H</td>
</tr>
<tr>
<td>409</td>
<td>E/W</td>
</tr>
<tr>
<td>411</td>
<td>H/H</td>
</tr>
<tr>
<td>613</td>
<td>E/W + Fullbody shower</td>
</tr>
<tr>
<td>623</td>
<td>H/H</td>
</tr>
<tr>
<td>717</td>
<td>H/H (inside 715)</td>
</tr>
</tbody>
</table>

3. EARTHQUAKE

a) In the event of a strong earthquake take immediate cover under any solid structure table, bench, doorway.

b) When an earthquake happens:
Get under your desk (stand in a doorway or lie beside a solid structure and hold on). Desks will walk if the shaking is strong enough.
Do whatever is necessary to survive. Stay a survivor!

When shaking stops:
- If a fire has started put out if possible.
- Check for electrical and gas hazards – there’s no point in becoming a casualty once you’ve survived the quake.
- Turn off all electrical switches and gas taps.
- Assist those nearest to you who may be injured.
- **Do not go outside** – the hazards out there may be worse, example: falling masonry/glass.
- Wait for instructions from your Warden.
If an evacuation is initiated:
- Keep together with your group.
- Follow your Warden’s instructions
- Proceed to an assembly centre.

4. BOMB THREAT STRATEGY
If you receive a bomb threat **stay calm**. Get as much information as possible (use the “green card” to assist you). Contact the Floor Warden (or the Building Warden) directly.

The **Building Warden** is the **Incident Control Officer**. This person is responsible for ensuring that Police are informed immediately. The Building Warden will co-ordinate all search procedures and make any decisions regarding evacuation or re-entry. If the Building Warden orders an evacuation, exit by the same routes used for fire, unless directed otherwise by the Floor Warden.

5. ACCIDENTS
An accident is an event that causes a person to be harmed, or could, in different circumstances cause a person to be harmed. An incident is a "near miss" accident that generally doesn't cause injury.

When an accident happens:

1. Give **first aid assistance** if required, and do not hesitate to call an ambulance if the injury is serious.

2. Contact:

<table>
<thead>
<tr>
<th>Name</th>
<th>Room</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cliff Franklin</td>
<td>rm303</td>
<td>x7611</td>
</tr>
<tr>
<td>Alistair Lightfoot</td>
<td>rm303</td>
<td>x7611</td>
</tr>
<tr>
<td>Graeme MacDonald</td>
<td>rm209</td>
<td>x6583</td>
</tr>
<tr>
<td>Graeme Plank</td>
<td>rm809b</td>
<td>x7586</td>
</tr>
<tr>
<td>Wayne Smith</td>
<td>rm206</td>
<td>x7609</td>
</tr>
<tr>
<td>Robert Thirkettle</td>
<td>rm106</td>
<td>x6510</td>
</tr>
<tr>
<td>Nigel Frost</td>
<td>Mt John</td>
<td>x2701</td>
</tr>
</tbody>
</table>

for guidance if required.

3. Keep unnecessary people away from the scene.

4. If the accident involves serious harm, do not interfere with the accident scene except to treat an injured person or prevent further injury or serious damage to property.

All accident injuries must be reported promptly to the Department Safety Officer or Designate. Also a University “Event” form which is available from the mail room, off the photocopier room (room 709), must be completed as soon as possible and returned to the Safety Officer. This assists the university to meet its requirements under the Health and Safety in Employment Act to record and investigate accidents, and remedy or monitor hazards.

A **critical incident** is an unforeseen and traumatic crisis event which could cause severe stress to the person who witnesses it. Examples include workplace violence, witnessing a fatality or near fatality, bomb threats, assault, explosions, etc. If a critical incident involves injury, follow the steps above. In all cases, contact the **University Security Centre** and inform them of the situation.
6. **FIRST AID ASSISTANCE**

The Department has a number of First-Aid Officers who are available for assistance after an injury. A Medical Practitioner is available at Student Health Service. For details see the EMERGENCY and SAFETY INFORMATION notices which are displayed throughout the building.

The following persons have current first aid certificates.

Refer to list on pg9, section 5

For professional first aid help, first phone the Health Centre, Ext. 6402 day and night. In the case of serious injury or illness telephone Security 6111 and request an ambulance.

First aid facilities in the Rutherford Building are:

a) First Aid Room. A First Aid Room is located on level 3 of Chemistry at the south end. Bruce Reid (Room 834, Chemistry) must be notified as soon as possible when this room has been used.

b) First Aid Boxes are located on each floor. These are clearly identified by a standard First Aid sign. The stock levels of First Aid requisites as determined by Cliff Franklin must be maintained.

c) Showers and Eyewash Stations are located throughout the building. The nearest safety shower is located in the link block on level 8

   Room:
   
<table>
<thead>
<tr>
<th>Room</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>108</td>
<td>E/W</td>
</tr>
<tr>
<td>109</td>
<td>H/H</td>
</tr>
<tr>
<td>118</td>
<td>H/H</td>
</tr>
<tr>
<td>119</td>
<td>H/H + E/W</td>
</tr>
<tr>
<td>209</td>
<td>H/H</td>
</tr>
<tr>
<td>409</td>
<td>E/W</td>
</tr>
<tr>
<td>412</td>
<td>H/H</td>
</tr>
<tr>
<td>613</td>
<td>E/W + Fullbody shower</td>
</tr>
<tr>
<td>624</td>
<td>H/H</td>
</tr>
<tr>
<td>717</td>
<td>H/H ( inside 715 )</td>
</tr>
</tbody>
</table>

d) Stretcher. A stretcher for emergency use is available in the stores office (Room 109, Physics & Astronomy Loading Bay).
D. EVACUATION PROCEDURES

When fire horns sound you must leave the building immediately, using either the stairs in the link block or north end of the building, and assemble on the grass area on the west side of the building by the Physical Sciences Library. Do not gather too close to the building.

DO NOT USE LIFTS. They may fail in an emergency.

If a person is unable to leave the building by stairs, leave them with someone near the main lifts and contact the building warden or fire brigade immediately on reaching main fire exit.

1. FIRE ALARM

- Turn off all bunsen burners.
- Electrical equipment that cannot be left unattended, must be turned off.
- Close the windows.
- Turn off LPG isolation valve switch.
- Leave the room and close the door.
- Make sure all the corridor doors are closed to prevent draughts. **Do not activate fire doors at lift end.**
- Leave the building under the direction of the floor warden, using the stairs in the link block or north end of the building.
- If for some reason a warden is missing, any member of staff should be prepared to take over.

2. EMERGENCY WARDEN

During normal working hours Floor Wardens have been appointed to all floors. All staff are required to co-operate and comply with their instructions during an emergency and, if wardens are absent, take over their role.

The following persons have been appointed as wardens for the Physics and Astronomy Department.

**Floor Wardens**

See page one: Wayne Smith has overall charge of the evacuation of the building.

**Responsibilities of Wardens**

- Instructing all personnel to leave the building immediately the fire alarm sounds.
- Ensuring as far as possible that their floor is clear.
- Reporting to the Building Warden the location of persons remaining in the building.
  - i) disabled persons and escorts
  - ii) persons trapped
- Checking that all LPG isolation valve switch indicator lights are off.
- Once you have checked your floor you then report to the Building Warden the state of your floor e.g. clear or unclear.
- To wear the wardens arm band which is situated at the link end of the corridors before the smoke stop doors beside floor wardens photo’s.

3. UNDERGRADUATE LABORATORIES

Staff in charge of undergraduate laboratories should get students to stop their work, turn off burners,
turn off electrical gear and shut windows and doors.

In the event of the fire preventing you leaving by the designated exit, be sensible and use the exit at the other end.

After leaving the building, move away on to the grass to the west side of the building.

Any comments or suggestions regarding emergency evacuation procedures within the Department should be directed to Wayne Smith (Building Warden) or the Department Safety Officer.
E. ACCESS TO THE BUILDING

1. Normal Working Days
The doors of the building are open from 7.30 am to 6.00 pm Monday to Friday on normal working days.

2. Night Time, Weekends, University or Public Holidays
The doors of the building are locked throughout all holidays, and every night between 6.00 pm and 8.00 am during which time the only entry and normal exit is via the front door on the Physics and Astronomy side of the entrance foyer and the north end of the building.

3. Working Outside Normal Hours
Any inherently hazardous operations should never be carried out alone, they should only proceed when informed people are in the vicinity; nights and holidays should be avoided, but if this is not possible, at least one other person should be within easy call and know that the operation is being performed.

All equipment not in use must be turned off at the power outlet during the night, weekend etc. Equipment which must operate unattended at such times must have an equipment card (available from Room 705) displayed in a position easily read by security guards. Cards must be signed by a supervisor.

4. Visitors
All Visitors are the responsibility of their host. In the event of an emergency, all long term visitors must be made aware of the safety requirements and evacuation procedures of the department.

Contractors must liaise with Graeme Kershaw, Room 106, Ext. 6510, before commencing work within the Department.

The practice of staff members bringing in young children into the Department, especially in the evening or at weekends, is potentially dangerous and undesirable. Laboratories and workshops are strictly out-of-bounds to children.

5. Department Workshops
Use of machinery restricted to authorised staff only. Visitors to workshop must report to workshop office. All staff and students must wear suitable protective footwear and be aware of hazards related to the environment.
F. PERSONAL PROTECTION

1. Potentially Hazardous Situation
All staff and research students are encouraged to report to Department Safety Officer, Deputy Safety Officer or a member of the Safety Committee, any perceived or suspected hazardous situation or practice, including a “Near Miss”! A Hazard Form, available from the main office (room 705) should also be completed and returned to Deputy Safety Officer, Room 303. These forms are also available from the mail room off the photocopier room (room 709).

2. Hazard Identification
Copies of the following forms are available from the Office (Rm 705) or from the mail room off the photocopier room (Rm 709).

- HAZARD/INCIDENT ALERT
- ACCIDENT OR SERIOUS HARM REPORT
- SELF-REPORT OF DISCOMFORT AND PAIN

3. Dress
The Department's safety rules on dress must be observed. They can be briefly summarised as follows: Each worker in a Laboratory, Store or Workshop must wear adequate town or walking shoes, suitable eye protection and specially provided protective gloves, and footwear or clothing when necessary. Long hair must be properly confined to avoid entanglements.

4. Eye Protection
In any laboratory containing glassware and/or chemicals there is an ever present risk of serious eye injury. If you are at risk of serious injury due to events in any part of the laboratory, you must not take off your safety glasses. Supervisory staff should be particularly vigilant in bringing such risks to the attention of other staff, and ensuring that appropriate protection is provided and used.

Simple safety glasses with shatterproof lenses and protective side panels are adequate for most laboratory situations. Students who wear contact lenses are however subject to an especial hazard. In the event of chemicals entering the eye it is often difficult to remove contact lenses in order to allow thorough washing of the eye. This makes it essential that further safety measures are undertaken. Contact lens wearers should either arrange to wear prescription safety glasses in the laboratory and thereby avoid the problem or they should wear full protective goggles whilst in the laboratory.

Where ultraviolet light is being used (e.g. in photography, lasers or UV spectrophotometers etc.) appropriate protective glasses must be worn.

All laser light sources must be regarded as potentially dangerous. Never look directly into a laser beam, or a beam reflected from another surface. Laboratories containing analytical equipment fitting with a laser light source should display the standard “Caution/Danger Laser Beam” sign on the door. Any procedure requiring an exposed laser beam, must be performed by a suitably protected and qualified person, during which time a “NO ENTRY” sign must be displayed on the door.

5. Food and Drink in Laboratories
Eating lunches and brewing tea or coffee in laboratories is unacceptable for obvious safety reasons. In particular, never drink from a beaker or flask: this practice has led elsewhere to fatal accidents. Foodstuffs must not be stored in laboratory refrigerators or warmed in laboratory ovens. The only place food may be heated is in the cooking equipment in the seminar room (701) and Room 205.
6. **Smoking**
Smoking is prohibited in the building.

7. **Running in the Building**
Except in an emergency, do not run within the building. A collision with another person carrying something could be very serious, and slipping on floors and stairs is a common cause of injury.

8. **Unsafe Condition Report**
When anyone in the Department considers that there is a deficiency in current safety procedures, or that improvements could be made in certain areas, there are a number of communication avenues open to the person. The matter can be reported to a member of the Safety Committee. The Safety Committee member will then, after broader consultation, decide whether there is a case for taking the matter to the Chair of the Safety Committee. If the matter concerns a change in Department policy, the Chair will convene a meeting of the Safety Committee to discuss the issue.
G. SEXUAL HARASSMENT / GENERAL HARASSMENT

Harassment can happen to anyone: students, staff, women or men. It can also come from anyone. Sexual harassment usually involves abuse of power, and is serious and distressing for the recipient of harassment. Please refer to the notices distributed around the University giving details of Sexual Harassment Officers.

A pamphlet on sexual harassment, and a complete listing of people throughout the University that complaints can be directed to is available from Registry.

Remember: if you are being harassed, it is not your fault. You have the responsibility to yourself and to other potential victims to do something about sexual harassment immediately.
H. **SAFETY IN THE USE OF EQUIPMENT**

1. **Glassware**
   Glass apparatus which is cracked or has jagged edges must be repaired or disposed of immediately. The most common causes of major or minor cuts to the hands are:
   a) Handling damaged glassware
   b) Pushing glass tubing through a hole in the rubber stopper
   c) Fitting flexible tubing to a glass tube or outlet

   The possibility of injury arising from (b) and (c) can be reduced by using tubing of the correct size together with a small amount of lubricant (glycerol and ethanol, or preferably water).

   a) **Pipettes.** Never use mouth suction pipetting for any substance or solution that could be injurious if it entered the mouth, eg. strong acids, alkalis and solvents. There are several excellent mechanical-suction devices for pipettes quite readily available.

   b) **Glassware under Vacuum.** All glassware subject to vacuum conditions must be of the correct design and manufacture, it should be periodically checked for strain and damage, and all such glassware drawn “new” from store should be similarly checked before use. Strain checks and annealing, if required, can be carried out by Glassblowing Workshop (in Chemistry).

   c) **Dirty Glassware.** All dirty glassware should be rinsed free of harmful chemicals before being set aside for washing up.

   d) **Chromic Acid Cleaning.** All containers of “Chromic” or other acids for cleaning pipettes etc. should be of polythene (with or without a glass liner) and should be secured to a wall by an easily removable polythene strap. These and other containers of “acid” should also stand in a vessel or tray large enough to contain the whole volume should the container develop a leak.

2. **Electrical Equipment**
   All work involving the electrical installation of the buildings, i.e. fittings, fixed wiring, switchboards, etc., shall be carried out by Works and Services staff. Repair or modification to all equipment capable of being connected to the electrical installation of the buildings shall be carried out only by authorised electronic or mechanical workshop staff.

   All new and externally borrowed mains operated equipment must be inspected and approved by electrically registered technical staff before that equipment may be installed.

   Electrical leads should be removed from the power outlet by pulling on the plug, and not on the cable.

   Electrical cables should be kept off floors to minimise hazards and to assist the cleaners. If this is unavoidable then a ramped cover must be installed over the cables to facilitate the movement of equipment and to minimise accidents.

   a) **Circuit Breakers.** When a circuit breaker has “tripped” on overload, the circuit and its load must be checked by an authorised person before power is restored.

   b) **Multi Outlet Power Boards** should be fixed to a vertical surface and not left lying “socket up” on a bench top, or on the floor.
c) **Double Adapters.** Not more than one double adapter may be used per power outlet.

d) **Electric Heaters.** “Open bar” radiators and fan heaters in Laboratories and Stores are unacceptable fire and explosion hazards and must not be used. Hair dryers are equally hazardous in the presence of flammable solvents and should be used with extreme care. Modern hot plates and hot plate/stirrers are usually suitable for work with flammable solvents. Care must be taken not to use those of older designs that could have open heaters under the top plate.

e) **Refrigerators.** NO FLAMMABLES SHOULD BE STORED IN REFRIGERATORS UNLESS SPECIALLY MODIFIED.

3. **Water cooled systems**

a) Connections to metal pipework should be made either with copper tubing via the appropriate fittings or with the yellow tubing and secured with the metal band clamps available from the Instrument Workshop (if in doubt see Wayne Smith in the Instrument Workshop or Graeme Kershaw in the Mechanical Workshop). Tubing attached to a tap must be securely clamped and drain lines held in position.

b) Rubber tubing in good condition can be used for glass condensers, however, if these are to be left unattended for long periods the tubing must be secured to the tap and the condenser with tube clamps.

c) The water pressure to the building can vary overnight and sudden changes in pressure can part poor connections.

d) If cooling water is not required overnight then turn it off before you leave.

4. **Fume Cupboards**

Fume cupboards should not be used for storage of dangerous chemicals. N.Z.S. 7203. If fume cupboards are found in an untidy and hazardous state and used to store chemicals the laboratory in which it is situated will be closed down until the accepted standards are met.

The sash on the fume cupboards must be pulled down below the indicated mark at all times, except when setting up equipment. This allows an adequate air flow through the cupboard.

Any queries as to the suitability of a fume cupboard for a specific operation must be directed to Department Safety Officer, Deputy Safety Officer or a member of the Safety Committee.

Fume cupboards should be kept clean and clear of all unnecessary bottles and apparatus, and the practice of storing materials in a fume cupboard is prohibited.

5. **Gas Cylinders**

All gas cylinders must be securely chained or strapped in an upright position to a bench or wall. Proper trolleys should be used for transport of cylinders. Some other precautions are:

a) Do not store or use compressed gases in unventilated areas.

b) Avoid mechanical damage to cylinders or their control valves: their destructive potential is unbelievable.

c) Do not use undue force in opening or closing a valve. Never use oil or grease!

d) Special precautions are needed when using compressed (or liquefied) toxic gases such as chlorine, ammonia etc. The Departmental Safety Committee must be
consulted before such cylinders are brought into or used in the Department.

e) All gas cylinders not connected to apparatus must be stored in the Chemistry Department gas bottle store. Access to this is via the Chemistry Storeman.

6. Minor Maintenance

Minor maintenance jobs, such as leaking taps, faulty lights, steam leaks, faulty electrical switches, etc., should be reported to Graeme Kershaw as soon as possible.

In cases where a potential hazard is involved (e.g., leaking gas taps) contact Works and Services (Ext. 6400) directly or Security after hours (Ext. 6111).
I. SAFETY IN THE USE OF LABORATORY SPACE

1. General Laboratories

Good housekeeping should always be maintained; it is an essential part of basic Laboratory practice and Laboratory safety.

- Dispose of unwanted materials immediately
- Clean up all spills right away
- Maintain adequate working space
- Keep floors and exits clear of apparatus and materials
J. SAFETY IN THE USE OF CHEMICALS

1. Use and Transport of Chemicals

Many chemicals cause poisoning if they are inhaled, ingested, or come into contact with the skin. Some chemicals, if improperly handled, cause fire or explosion. Memorise the emergency safety routines and know where to find fire fighting equipment and the nearest large sink and eyewash stations. Above all, familiarise yourself with the hazards of, and the control procedures for, the chemicals that you use.

All containers must be clearly labelled with the current contents. Containers should never carry more than one contents label and unlabelled containers should be taken to the Chemistry Issue Store for disposal. Unlabelled containers are the responsibility of the supervisor of the laboratory in which they are found.

Before obtaining a new hazardous chemical or instituting a new hazardous procedure it is essential to check with your supervisor, Safety Officer or member of the Safety Committee. It is the responsibility of persons using dangerous materials to warn relevant personnel of the potential hazard. When new unusually hazardous chemical is brought into the laboratory an “Unusually Hazardous Substance Form (PSH2)” must be completed and a suitable hazard control procedure devised. The relevant Material Data Sheets must be studied and be in easy access for when required.

Problems have arisen in the Department because stocks of hazardous chemicals that are no longer needed tend to build up over the years. To prevent this, order the minimum needed for the work in hand. For example if you need 10mL of a solvent, get it from a colleague rather than obtaining a large volume.

Experiments using dangerous chemicals must be carried out in fume cupboards.

Special precautions are needed with highly toxic volatile materials (e.g. HCN) or large quantities of flammable solvents. Never use naked lights or non-spark-free electrical appliances near flammable or explosive solvents. Experiments involving quantities of flammable solvents or any other hazardous material or procedures would not be conducted outside normal working hours (8.30 am - 5.00 pm). If you have to carry out a hazardous procedure, even during normal hours, make sure that your colleagues know what you are doing.

In the interests of safety, bulk chemicals and potentially hazardous chemicals in any quantity should not be carried in the passenger lifts. In addition:

a) The following chemicals are banned from passenger lifts in any quantities: Strong acids and bases, volatile solvents, flammable liquids and toxic solids.

b) Large gas cylinders and filled cryogenic dewars are not permitted unless the proper procedures are followed.

Alternative arrangements to transport items referred to in b) in the goods lift must be made with Cryogenics staff.

All quantities of acids, caustic, flammable or dangerous liquids should be transported in a “Winchester Carrier” to and from laboratories and stores in the goods lift.
2. **Carcinogens**
Every effort should first be made to find an alternative chemical that is not a carcinogen.

a) **Storage of Carcinogenic Substances.** Containers should be placed in a polythene bag, sealed with sellotape and clearly labelled:
   “CARCINOGEN” or “SUSPECTED CARCINOGEN”
   and stored away from other chemicals.

b) **Handling Carcinogens.** Personal protection is required to prevent any absorption through the mouth, lungs or skin (see appendix D).
   Small amounts may be weighed and dispensed in a small disposable cabinet.

3. **Liquid Nitrogen and Solid Carbon Dioxide**
Liquid nitrogen is a dangerous material. Safety spectacles should be worn when transferring it into or out of a vacuum flask, no matter what the quantity.

a) **Transporting: for the safety of yourself and others.**
   i) Liquid nitrogen should never be transported via the staircase.
   ii) Up to one litre of liquid nitrogen in a Dewar flask covered with a lid can be carried by a person via the lifts.
   iii) Volumes larger than one litre should be carried in containers secured on trolleys. If the trolley is to be transported between floors, then the lifts should be used. In this case, the trolleys should be sent in the lifts unattended. To do this you need to place the trolley into the lift and on the black keypad below the floor buttons enter the following code 7683# then enter floor to which you want to send the trolley. The lift will travel directly to that floor and sit with the doors open for 5 minutes to enable you to get to the floor and retrieve your trolley. **Please note after 5 minutes the lift will automatically go back into general service.**

b) All liquid nitrogen containers should be completely emptied at least twice a year, because of the gradual accumulation of liquid oxygen.

c) Liquid nitrogen traps on vacuum lines tend to liquefy air passing through the trap as well as organic vapours, to give a dangerous combination. Do not draw air through a trap unnecessarily and always empty the trap immediately after use.

d) Both liquid nitrogen and solid carbon dioxide must be stored in a ventilated area: never in a Cold Room.

e) Liquid air should never be used in the department.

4. **Oxygen**
Ensure that oxygen cylinders are shut off securely when not in use, and that there are no leaks in an “oxygen system” when in use. The risk of fire is considerably increased by an oxygen enriched atmosphere.

5. **Storage of Chemicals**
a) Oxidising and dangerous acids should be stored standing in a plastic tray. Strong acids should not be stored close to solvents.

b) Ensure that flammable and corrosive chemicals are NEVER in the same cabinet.

c) Bottles larger than one litre should not be stored on shelves above eye level.
d) Winchester bottles whether empty or containing liquid should not be stored on the floor.

e) The practice of storing materials in a fume cupboard is prohibited.

6. **Disposal of Chemicals**

Information on the disposal of chemical wastes can be found on M.D.H.S. system located on level one corridor (Chemistry). Consult your supervisor or Peter Harland if in doubt. Each individual user carries the responsibility for checking on the properties and disposal methods for materials used. All bottles must be labelled and all wastes delivered to the store must be labelled and rendered safe to handle by untrained personnel. A “Waste Disposal Request Form” is required for each item.

Water miscible solvents may be poured down the sink with dilution. All chemicals which cannot be disposed of via the sewage system must be neutralised and labelled, and returned to the store for disposal at a later date via a controlled land fill site.

Solvents must not be poured down the sink. They must be collected in “solvent residue” bottles, which will be emptied regularly. Do not mix acetone and chloroform in the residue bottles; the resulting mixture may explode. Solvent residues and other materials for disposal may be left in the designated area of the Chemistry Store after advising the Storeman, who will reject the items if unsatisfactory for disposal. The Safety Committee will assist groups to dispose of hazardous, water immiscible and flammable materials, and should be consulted.

If you are about to leave the Department or complete a project, consult your supervisor about safe disposal of any hazardous chemicals you may have remaining in your laboratory.

Also see Appendix A.

8. **Accidents Involving Chemicals**

For the safety of others, spillage of chemicals on benches or floors must be cleaned up immediately, irrespective of whether they are dangerous or not.

If a major spillage of a dangerous chemical occurs, warn other people to keep clear of the immediate area and seek assistance from the Safety Officer or a member of the Safety Committee.

9. **Multi-Gas Detector**

A Gastec Multi-Gas Detector is kept in Room 834 (Chemistry) with the following detector tubes: carbon monoxide, hydrogen fluoride, LP Gas.
K. AFTER AN INCIDENT

1. Serious Harm Reporting Criteria

Definition:

The following types of harm are defined in Schedule 1 as "serious harm" for the purposes of the Act:

1. Any of the following conditions that amounts to or results in permanent loss of bodily function, or temporary severe loss of bodily function: respiratory disease, noise-induced hearing loss, neurological disease, cancer, dermatological disease, communicable disease, musculoskeletal disease, illness caused by exposure to infected material, decompression sickness, poisoning, vision impairment, chemical or hot-metal burn of eye, penetrating wound of eye, bone fracture, laceration, crushing.

2. Amputation of body part.

3. Burns requiring referral to a specialist registered medical practitioner or specialist outpatient clinic.

4. Loss of consciousness from lack of oxygen.

5. Loss of consciousness, or acute illness requiring treatment by a registered medical practitioner, from absorption, inhalation or ingestion of any substance.

6. Any harm that causes the person harmed to be hospitalised for a period of 48 hours or more commencing within 7 days of the harm's occurrence.

In the instance of Serious Harm, the Health & Safety Manager is available 24 hours, 7 days a week.

If a Serious Harm incident occurs, please contact the Health & Safety Manager IMMEDIATELY on 027-438-7842 or alternatively the Health & Safety Advisor on 027-742-8689.

Where Serious Harm has occurred to an employee, a contractor or a person on work experience, the accident scene must not be disturbed until a Department of Labour Health & Safety Inspector (or Maritime New Zealand) has given their permission to do so. This requirement to report Serious Harm accidents applies 24 hours a day. Notice of a Serious Harm event must be conveyed to the Health & Safety Manager as soon as possible and prior to notifications to the Department of Labour and other government authorities. In the Health & Safety Manager's absence, a senior manager must be notified.

Event Report Form

The Event Report Form (Word) is used to report Injury, Illness, Discomfort and Pain, Near Miss, Incident, and Serious Harm.

The Event Report Form is used to report any event which involves an Employee, Student, Visitor, Contractor, Volunteer, or a Person on Work Experience.

Forms are available from the Mail Room, 709
NB: No event is insignificant. All events should be reported immediately.

2. **Pain and Discomfort**

Discomfort pain and injury covers many conditions of the muscles and bones:

- Gradual process injuries
- Simple back pain
- Sprains and strains

Usually these arise gradually over time, rather than from sudden events.

Sometimes discomfort, pain and injury may appear as one of these conditions after a sudden event. But in reality the sudden event may have been merely ‘the straw that broke the camel’s back’.

Importantly discomfort, pain and injury is by no means a clearly defined group of conditions, even traumatic injuries, such as cutting a finger or suffering a fracture in a fall, may have elements of the factors that contribute to discomfort, pain and injury.

For further information see the Health and Safety Website at: [https://intranet.canterbury.ac.nz/hs/info_training/dpi_info.shtml](https://intranet.canterbury.ac.nz/hs/info_training/dpi_info.shtml)

*If in doubt, see your supervisor, or fill out the form found on the link above.*

3. **Rehabilitation**

Vocational Rehabilitation (staff only)

The University of Canterbury and ACC are committed to helping you recover and get back to work as soon as possible by offering you support and assistance. This is called vocational rehabilitation. For more information on vocational rehabilitation please see the [Vocational rehabilitation - Returning to work or regaining your ability to work after an injury fact sheet (PDF)](https://intranet.canterbury.ac.nz/hs/info_training/dpi_info.shtml).

Where a staff member is injured, light duties identified as appropriate will be carried out until the injured person is certified fit by a medical professional for full previous duties.
L HIGH RISK RESPONSE GROUP

In the case of an emergency, all support should be given to the High Risk Response Group. In Physics and Astronomy they are concerned with the Radioactive Materials Store, and Cryogenics. The contact person in this department is the Head of Department.
Appendix E

Radiation Safety Plan

Sealed Radioactive Sources

Radiation Safety Policy
The Department of Physics and Astronomy will ensure, as far as reasonably possible, the health and safety of its employees, contractors working on the premises, and members of the public who may be exposed to the hazards arising from the use of sealed radioactive sources.

No staff member of the Department of Physics and Astronomy is permitted to use sealed radioactive sources unless they are so authorised in this Radiation Safety Plan and has signed the relevant entry to indicate familiarity with and acceptance of the requirements and procedures in this Radiation Safety Plan.

Responsibilities and Authorisations

Principal licensee
Overall responsibility for ensuring this Radiation Safety Plan is implemented and reviewed lies with the principle licensee for the Department of Physics and Astronomy.

<table>
<thead>
<tr>
<th>Name</th>
<th>License number</th>
<th>Position title</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cliff Franklin</td>
<td>15986</td>
<td>Lab Supervisor</td>
<td></td>
</tr>
</tbody>
</table>

Licensed users
The following licensed persons are authorised to use the sealed radioactive sources of the Department of Physics and Astronomy and are responsible for complying with the procedures in this Radiation Safety Plan.

<table>
<thead>
<tr>
<th>Name</th>
<th>License number</th>
<th>Position title</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orlon Peterson</td>
<td>22885</td>
<td>IT Supervisor</td>
<td></td>
</tr>
</tbody>
</table>

Persons authorised by the principal licensee to use sealed radioactive sources under instruction
The following persons are authorised to use the sealed radioactive sources of the Department of Physics and Astronomy under the instructions of the principal licensee, and are responsible for complying with the procedures in this Radiation Safety Plan. They are authorised to act as the principal licensees delegate for the purpose of undergraduate laboratory supervision. These persons must receive training on the basic radiation protection requirements associated with the safe use of sealed radioactive sources before being so authorised.