

**Risk Assessment  
Research Room 1017**

08 October 2007

**Laser hazards:**

This laboratory contains the following laser sources:

	Laser medium	Wavelength	Max power	Class
Main beams for magneto-optical trap	AlGaAs diode	780 nm	400 mW	IIIb
Spectroscopy lasers (various)	AlGaAs diode	780 nm	100 mW	IIIb
Sacher Tiger, Toptica BoostTA	AlGaAs diode	780 nm	1 W	IV

**Special precautions for laser work:**

- Class IIIb and IV lasers are to be interlocked to the lab door, via power supplies or shutters, at all times.
- The use of suitable goggles is strongly advised and encouraged, especially during beam alignment and by guests and others not actively involved.
- Beams should, as far as possible, be kept to a horizontal plane within the optical table beam shields. Special beam shields should be installed for out-of-plane beams, such as those associated with the MOT.
- The most hazardous operations involve the positioning of components within the laser beam. Careful thought should be given to the directions of new reflections, especially with regard to other individuals present. It is good practice to block the laser beam securely before introducing new components.
- Rings, wristwatches and other reflective items of jewellery should not be worn when working with class III/IV laser beams.

**Hazardous materials:**

- The SAES rubidium sources contain small quantities of zirconium powder and rubidium chromate, which may cause cancer by inhalation and sensitization by contact and are toxic to aquatic organisms. Although the sources are well packaged, it is advisable to wear gloves and avoid dust inhalation on the rare occasions when they are handled or the MOT is open to air. A 'material safety data sheet' is available and should be read.

## Electrical Hazards:

There are no specific electrical hazards associated with this project, but good laboratory practice dictates that

- laser power supplies and other mains electrical units be raised above the floor to avoid electrical hazards in the event of spillages or flooding of the lab
- repairs and alterations to mains electrical units be carried out or checked by appropriately experienced personnel, and
- mains electrical units be tested annually

## Electronic Development - Hazards:

The development of control and supply electronics may involve running high voltage apparatus while the equipment covers are removed to allow access to test points, or while the prototype is still under development. Good laboratory practice dictates that

- the apparatus be positioned securely, to minimize the chance of accidental contact with high voltages. High voltage conductors should not be exposed unnecessarily
- exposed metalwork be earthed to give protection should high voltage wiring become loose
- there be good illumination, which should not rely upon the power circuit used to supply the apparatus under test, which could be tripped during testing; and
- testing be performed only by appropriately briefed or experienced personnel.
- Care should also be taken to minimize inhalation of flux and insulation fumes while soldering; for big jobs, fume extraction apparatus should be used. Keep the iron tip clean, and use solder with a lower-hazard flux when possible.

## General:

Most laboratory accidents involve tripping over obstacles or the careless use of tools.

- The lab is to be kept reasonably tidy at all times. It is especially important that the floor area be kept clear, as many experiments are conducted in poor light. Coolant pipes etc. that run across the floor are to be taped or covered by a ramp.
- Methanol, propanol and acetone are used in small quantities for cleaning optics. These solvents are to be kept in labelled bottles, and the main supplies stored in a fireproof cupboard. Skin contact and fume inhalation should be avoided.
- Appropriate training should be given before letting anyone work alone in the lab.

## Emergencies and First Aid:

Nearest fire extinguisher: in foyer, outside room 1047 (x-ray lab)

Nearest first aid kits: to left of door in room 1017 (this lab)  
room 1001 (student workshop)

Emergency assistance: internal emergency dial 112  
public emergency dial 91-999

Departmental First Aid: Arthur Longhurst room 4113 ext 27978  
Damon Grimsey room 1005 (main workshop) ext 22040  
Mark Scully room 1001 (student workshop) ext 22040

Authorised User	Signature	Date
Tim Freearde		
Matthew Himsworth		
James Bateman		
Richard Murray		
André Xuereb		

I have read this risk assessment, and will adhere to it.