

Risk Assessment Form



Title of Assessment

Superconductivity and Magnetism Labs Risk Assessment
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Date of assessment

04/11/19

Department

Physics

Date for review

Continuous

Descriptions of Activities

Risk assessment for laboratory work at the University of Warwick site conducted by William Blackmore pertaining to the research project entitled 'ExtremeQuantum' (PI: Dr Paul Goddard).
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Name of those working to this assessment

William Blackmore

Any others who may be affected by this assessment

Other team members who use the lab spaces and equipment

Assessment carried out by

William Blackmore

Additional information

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Foreseeable Significant Hazard	Existing control measures	Inherent Risk	Additional control measures	By whom & when	Controlled Risk Level
Laser exposure - ruby spectrometer (normal use)	Laser equipment only to be used by trained and authorised personnel. Full enclosure fitted to prevent accidental exposure to high power beam sections. Output from enclosure (end of fiber optic) is 1 mW, 532 nm visible CW. Overall system therefore does not exceed the power limit of laser Class 2 – no further safety measures than appropriate signage required. Dedicated risk assessment and safe system of work are provided separately and kept with the laser. All users must review. Note that opening the bolted enclosure and defeating the interlocks renders the system a Class 3b laser hazard, as advised by signage. This is necessary for realigning the system and this operation requires separate specific training, risk assessment and authorisation.	Severe	Clear signage informs personnel of the laser class and hazards. Avoid staring into the beam output from the optical fibre.	Users	V Low
Laser exposure - ruby spectrometer (realignment)	Laser equipment only to be used by trained and authorised personnel – authorised specifically for this operation in addition to the normal use. This operation requires opening the enclosure and overriding the interlocks to keep the beam on while adjusting the alignment of optical components. The laser hazard is therefore Class 3b.	Severe	Clear signage informs personnel of the laser class and hazards. To be carried out only in a keycode locked room with no optical access and clear signage forbidding entry. Lab then constitutes a Laser Controlled Area. Only users specifically trained and authorised for the realignment operation to be permitted inside the Area. Laser safety goggles appropriate	Users trained and authorised for this specific operation only – all other personnel to be removed from laser controlled area	V Low

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	Dedicated risk assessment and safe system of work are provided separately and kept with the laser. All users must review.		to this laser are kept with the system – these must be worn throughout, but not solely relied upon.		
Diamond Anvil Pressure cells – mechanical failures under load	Safety goggles worn when loading (loading refers to increasing the stored pressure via an external hydraulic press). Specifically trained and authorised users only. The stored energy in a diamond anvil type cell is extremely low due to the small pressure fluid volume.	Minor	Only trained users to be present in the lab during loading operations.	User, and (reduced risk) personnel in lab during operation	Low
Piston Cylinder Pressure cells – mechanical failures under load	Safety goggles worn when handling. Face guard worn during loading. Cells under load kept in strong, secure, well-labelled boxes when not in use. Avoid aiming the cylindrical axis of the cell at peoples' faces at all times when under load. Specifically trained and authorised users only.	Severe	Only trained users to be present in the lab during loading operations. Two users must be present for loading operations.	Users	Low
Pellet Press in P155 - Risk of trapping fingers. Overpumping causes dangerous levels of pressure.	Safety goggles to be worn at all times. Close perspex shield when pressing pellets, to avoid trapping fingers. Don't exceed 0.3 tonnes of pressure which is on the innermost scale of the dial. Various chemicals are store in P155, wear a lab coat and safety goggles when in the room and consult MSDS if using any chemicals.	Severe	Instruction booklet kept with equipment. Pellets are kept with member of facility staff to ensure only trained users operate equipment. Inspect all pieces of equipment before use.	Users	Low
Manual hydraulic ram – catching body parts between surfaces under load	Ram fitted with surrounding guard plates - must be in place when ram under load. Hands etc to be kept out of enclosure while loading. Specifically trained and authorised users only.	Severe	Only trained users to be present in the lab during operations where the press is under load.	Users	Low

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Handling chemical samples – inhalation or ingestion	MSDS to be consulted in each case and appropriate PPE worn and individual measures taken such as use of fume hoods in some cases. Standard lab procedures to be observed - no eating or drinking, hands to be washed after leaving etc.	V Low		User, and (reduced risk) personnel in lab during operation	V Low
Machining and polishing of BeCu alloys Ingestion of toxic Beryllium-containing dust	Minimal quantities involved (typically 8 mm disk, 0.08 mm thick, 0.5 mm diameter holes). Select machining parameters to minimise production of particulate matter. Ensure work area is free of draughts. Clean work areas thoroughly after use. Dispose of any contaminated gloves and cleaning tissues as hazardous waste in dedicated container within the lab. Conform to lab rules on washing hands and not eating and drinking in the lab environment.	Minor	All lab users to familiarise themselves with BeCu MSDS documentation. Only trained users to work machining BeCu.	All personnel in lab environment	Low
Use of chemical solvents – irritation to skin or eyes	Appropriate PPE and steps to be taken as with safety data sheets, as above.	Low	Any spills must be correctly cleaned, and major spills require department to be notified. All solvents to be correctly disposed of.	User, and (reduced risk) personnel in lab during operation	V Low
Laboratory sharps - blades, needles and used glassware	Adherence to safe lab protocol to be followed. Work on a clear workbench. Keep all sharp instruments covered when no longer in use. Dispose of sharp objects in sharps bin provided.	Low		All personnel in lab environment	Low
Use of cryogenic liquids	Will be trained before use and ensure safety course is attended. Ensure suitable ventilation is provided - asphyxiation hazard due to boiling cryogenic liquids. Dewars containing gases or cryogenic	Low		All personnel in lab environment	Low

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	liquids are to be transported in goods lift only and not to be accompanied. Eye and hand protection to be worn when handling cryogens.				
Use of instruments involving large magnetic fields – possible interference with pacemakers or metal implants	Ensure to warn people when entering the room if the magnet is charged. Warning signs displayed on doors. Make sure equipment is checked regularly if fields are changing. Door to 17 T magnet (Room P127) have key-code locks to allow only trained users access. Loose metal objects or sensitive electronics to be kept outside safe radius of 17 T magnet – this is marked on the floor.	Severe	Non-essential personnel to be kept out of labs with strong magnetic fields active or potentially active.	All personnel in lab environment who may enter 5 Gauss line of magnet in question	Low
Use of instruments involving X-ray generation (Ionising radiation source) – possible radiation burns or cellular damage	Diffraction meters are located in designated X-ray areas and are commercial controlled setups including interlocking doors and shields to prevent radiation exposure the surroundings, coupled with warning systems to indicate source is in use. Only to be used following proper training.	Severe	Ionising radiation safety course and training on individual instruments to be completed.	User of instrument, and other personnel present while radiation source is in use.	V Low
Moveable platform – falls	Brakes to be firmly applied and stability checked before mounting the platform. Overreach or overly strenuous tasks over platform rails to be avoided. Large loads to be lifted with additional aid.	Low		User	Low
Spillages and trip hazards	Fluid spillages or trailing wiring etc may constitute slip or trip hazards. Labs to be kept tidy and organised, and any spillages or mess to be cleared promptly.	V Low		Any personnel in environment	V Low

Work should not be carried out until the assessment is completed to a suitable & sufficient level and all required control measures are in place.

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Is assessment suitable and sufficient Yes

Any further actions required to allow work to commence	
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Approved By	Paul Goddard
Date	07/11/2019

Position	Principal Investigator
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Please print a copy, sign it and keep for your records

	Severity of injury				
Likelihood	Superficial	Minor	Serious	Major	Extreme
Unlikely	Very low	Very low	Low	Low	Moderate
Possible	Very low	Low	Low	Moderate	High
Likely	Low	Low	Moderate	High	Very high
Very likely	Low	Moderate	High	Very high	Very high
Extremely likely	Moderate	High	Very high	Very high	Very high

Overall Risk Rating (highest level found)	Low
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See 'Matrix for risk evaluation' for further guidance.