Risk Assessment

PROCEDURE:

- Complete risk assessment in consultation with PI/Supervisor and technical staff as appropriate.
- Risk assessment checked and signed by PI/Supervisor
- A copy or scan of the signed document to be given to the lab technician, School Safety Adviser and PI/Supervisor.

NOTES:

- No laboratory work is to commence without a risk assessment signed by the PI/Supervisor.
- The risk assessment must be reviewed when any changes are made to the equipment, materials, procedure or personnel.
- Technical staff can stop work if no risk assessment is in place or if, in their opinion, there is a risk to safety.
- Examples of how to complete this form are available at www.hse.gov.uk/risk/casestudies/

Project name:	Superconducting and Superinsulating Nanofluids		
Location of work:	Home Study, FRASER NOBLE 057		
Principal Investigator/Supervisor:	Dr Marcus Bannerman	Signed:	Date:
Assessment Prepared by:	Asad Mohiuddin	Signed: Asad.M	Date: 28/11/18
Outline description of the work:	Review nanofluids and their history in thermal conductivity enhancement. This includes describing what models have already been used to approximate their behaviour and critically review their applicability. Construct a Transient Heated Wire cell for the testing of liquid and gas mixture thermal conductivities and use this data to explore the anomalous heat transfer in nanofluids and gas mixtures which have similar dimensional properties to nanofluid systems. Perform molecular simulations of thermal conduction to confirm if transient effects in the thermal conductivity, possible at small time/length scales, dominate conduction. These simulations may be molecular dynamics simulations using DynamO, or coupled kinetic theory-hydrodynamics simulations using code developed by Craig Moir, a PhD student at Aberdeen. Explore new heat exchanger designs which incorporate any time-dependent anomalous phenomena.		
Names of persons carrying out the work:	Asad Mohiuddin (Student), Craig Moir (PhD Student), Dr Marcus Bannerman (Supervisor)		

What are the hazards?	Who might be harmed and how?	What are you already doing?	Do you need to do anything else to manage this risk?	Action by whom?	Action by when?	Done
Lifting heavy tools and equipment	Student – Back and neck injuries	Ask for assistance when moving items.	No	Student	Continuous	
Slipping and/or tripping	Student – Bruises, skeletal damage	Keep the floor clear of any unnecessary obstructions. Use wet floor sign when appropriate.	No	Student	Continuous	
Extended exposure to computer screen	Student – Headache, Sore eyes	Apply a blue light filter to keep retina healthy. Take regular breaks away from the screen.	No	Student	Continuous	
Soldering skin contact	Student – Temporary scars and burns	Take care when handling soldering iron. Insure the soldering iron is switched off or on its stand when not being used. Keep burnt skin under running cold water.	No	Student	Continuous	
Inhalation of melting flux from soldering	Student, Bystanders – Dizziness, headache, coughs	The smoke is harmless but long exposures can lead to discussed symptoms. Take regular breaks and avoid breathing directly into smoke.	No. But potentially in the future consideration in installing a fume extraction system.	Student	Continuous	
Malfunctioning of circuitry and equipment	Student, Bystanders – Electrical Fire	Take appropriate electrical fire precautions. Keep food and drinks away from electrical equipment. Read manual before handling equipment.	No	Student	Continuous	
Risk assessment for the future of the project (not currently used)						
Helium Gas	Student, Bystanders – Asphyxiation	Insure that the environment is well ventilated.	No	Student	Continuous	
Hydrogen Gas	Student, Bystanders – Flammable, Explosive	Use inert hydrogen gas. Keep the gas under the lower flammability.	No	Student	Continuous	
Water bath	Student – Water spillage, hot water/steam	Avoid moving the water bath if it contains water. Avoid excessive heating of the water.	No	Student	Continuous	