THE UNIVERSITY OF SYDNEY

SAFE WORK PROCEDURE

Use this form to document Safe Work Procedures for hazardous activities and processes. The information in your Safe Work Procedure (SWP) should be supported by a risk assessment.

Faculty/School:	School of Physics		**Initial Issue Date: February 2026**
			Next Review Date: February 2027
SWP Reference Number:	SWP-A28-SAIL-general-lab-safety	**Version: 1.0**	**Version Issue Date: February 2026**
SWP Title:	General Optical and Laser Laboratory Safety - All SAIL Lab Areas		
Prepared by:	Chris Betters		
Responsible supervisor/s:	Chris Betters, Sergio Leon-Saval, Barnaby Norris, Julia Bryant		

List the Hazards and risk controls as per risk assessment		
Associated risk assessment reference:	**Hazards**	**Risk controls**
RA-A28-SAIL-general-lab-safety	Unauthorised access, inadequate training or supervision (including undergraduate students)	- MANDATORY: SAIL Lab General Local Induction before swipe card access granted - Swipe card access control system; supervisor approval and authorised users list - MANDATORY: Undergraduates must be supervised at all times (supervisor physically present) - Authorised entry signage on laboratory doors (hazards and required PPE listed) - Visitors signed in and supervised at all times - Incident reporting via RiskWare system
RA-A28-SAIL-general-lab-safety	Optical radiation from bright light sources (alignment lasers, LEDs, lamps, broadband sources)	- Never look directly into any beam or bright light source - Use beam blocks and shutters when not actively aligning - Use viewing cards or cameras for beam visualisation - Appropriate safety glasses/goggles as indicated by door signage - Work at lowest intensity possible; turn off sources when not in use
RA-A28-SAIL-general-lab-safety	Laser radiation (Class 1, 2, 3R, 3B, 4 - equipment-specific RAs apply)	- MANDATORY: Laser Operator Certificate required for all work with or near lasers (uploaded to Faculty "My Inductions Dashboard") - Equipment-specific laser Risk Assessments and Safe Work Procedures must be followed - Laser interlock systems on applicable laboratory doors - NEVER bypass or defeat - Laser safety eyewear appropriate for wavelength and class (Class 3B/4 operation) - Beam paths at or below sitting height where possible; block beams when not aligning
RA-A28-SAIL-general-lab-safety	Specular reflections from optical surfaces (mirrors, lenses, beam splitters)	- Remove reflective items (watches, jewellery, lanyards) before optical work - Use anodised or black optical mounts to minimise stray reflections - Use beam dumps for unwanted beams - Position to avoid reflected beam paths; keep beams below eye level
RA-A28-SAIL-	Elevated carbon	- NEVER work in Room 116B with door closed (CO2 asphyxiation

general-lab-safety	dioxide levels in Room 116B (temperature-controlled room)	risk) - CO2 sensor and alarm system with automatic fresh air introduction - Evacuate immediately if CO2 alarm sounds - Warning signage on door regarding CO2 risk and door policy
RA-A28-SAIL-general-lab-safety	Sharps hazards from cleaved fibre optic ends (Rooms 121D, 218G)	- Follow Fibre Optics Handling RA/SWP (specialist document) - Dispose of cleaved fibre offcuts immediately in sharps containers - Safety glasses worn during fibre cleaving - Portable eyewash stations in fibre fabrication labs (121D, 218G)
RA-A28-SAIL-general-lab-safety	Electrical hazards (240V mains, high voltage equipment)	- Visual inspection of equipment, cords and plugs before use - Equipment test and tag current - Never use electrical equipment in wet conditions - Follow Electrical Safety RA/SWP; qualified electrician for all repairs
RA-A28-SAIL-general-lab-safety	Chemical hazards (solvents, adhesives, cleaning agents)	- Follow Chemical Handling RA/SWP; consult SDS before use - Appropriate PPE (chemical-resistant gloves, safety glasses, lab coat) - Use fume cupboard or well-ventilated areas; no naked flames near flammable solvents - Spill kits available; flammables stored in flammables cabinet
RA-A28-SAIL-general-lab-safety	Mechanical hazards (heavy optics, moving stages, sharp edges)	- Keep hands clear of moving parts; emergency stops on motorised equipment - Remove loose clothing, jewellery and lanyards near moving parts; tie back long hair - Handle sharp-edged mounts and metal components carefully
RA-A28-SAIL-general-lab-safety	Slips, trips, and falls (cables, equipment, spills)	- Cable management (along walls, overhead, or cable protectors across walkways) - Keep walkways and exits clear; store equipment on benches, not on floor - Clean up spills immediately; good housekeeping practices
RA-A28-SAIL-general-lab-safety	Manual handling of heavy equipment and optics	- Use mechanical aids (trolleys, hoists) for items over 15 kg or awkward loads - Two-person lift for heavy or awkward items; proper lifting technique - Closed-toe shoes mandatory; steel-toe boots recommended for heavy equipment moves
RA-A28-SAIL-general-lab-safety	Fire hazards (electrical faults, flammable chemicals, laser ignition)	- Fire extinguishers in laboratory areas (know nearest location and type) - Emergency exits marked; do not block exits or extinguishers - Flammable chemicals stored correctly; building evacuation procedures - If fire: evacuate, activate alarm, call 000
RA-A28-SAIL-general-lab-safety	Working alone or in isolation	- Buddy system encouraged, especially for after-hours or higher-risk work - Inform supervisor or colleague when working alone; mobile phone accessible - Never conduct high-risk activities alone (e.g., Class 4 lasers, working at height)
RA-A28-SAIL-general-lab-safety	Inadequate lighting or environmental conditions	- Maintain adequate lighting for safe movement; task lighting for detailed work - Red lighting for dark-adapted work; never work alone in darkened laboratories - Take regular breaks; adjust chair and bench height for comfort

List resources required including personal protective clothing, chemicals and equipment needed

PPE - GENERAL LABORATORY WORK (MINIMUM):
- Safety glasses or goggles (as indicated by door signage)
- Closed-toe shoes (mandatory in all laboratories)

- Long trousers (no shorts or skirts above knee)
- Laboratory coat (recommended, mandatory when indicated)

PPE - TASK-SPECIFIC (WHEN REQUIRED):
- Laser safety eyewear (specific wavelength and optical density for laser class)
- Chemical-resistant gloves (nitrile, latex, or as specified by SDS)
- Heat-resistant gloves (for handling hot components)
- Cut-resistant gloves (for handling sharp metal components - not during optical alignment)
- Face shield (for chemical handling or high-risk laser work)

PROHIBITED ITEMS:
- Reflective jewellery (watches, rings, bracelets) near active optical setups
- Loose or flowing clothing near moving equipment
- Open-toe shoes, sandals, thongs
- Shorts or skirts above knee length

EQUIPMENT AND MATERIALS AVAILABLE IN LABORATORIES:
- Optical benches and breadboards
- Mounting hardware and adjustment tools
- Alignment tools (beam viewing cards, IR viewers, cameras)
- Translation and rotation stages
- Optical components (mirrors, lenses, beam splitters, filters)
- Light sources and laser systems (equipment-specific RAs apply)
- Measurement and diagnostic equipment
- Computer workstations for equipment control

REQUIRED FOR SAFE OPERATION:
- Equipment-specific manuals and documentation
- Safety Data Sheets (SDS) for chemicals in use
- Equipment-specific RA/SWP documents
- Sign-in logs and supervision records
- Incident report forms (RiskWare access)

SAFETY EQUIPMENT - FIRE SAFETY (must be present and accessible):
- Fire extinguishers in various laboratory areas: dry powder (ABE) for general fires; CO_2 for electrical fires - know location nearest to your work area
- Emergency exit routes clearly marked
- Fire alarm pull points accessible

SAFETY EQUIPMENT - FIRST AID AND EMERGENCY RESPONSE:
- First aid kit on same level (near parents room, outside laboratories)
- Portable eyewash stations in Rooms 121D and 218G (fibre fabrication labs)
- Emergency eyewash stations (building facilities)
- Emergency contact numbers displayed
- Building evacuation assembly points marked

SAFETY EQUIPMENT - ROOM-SPECIFIC SYSTEMS:
- CO_2 sensor and alarm in Room 116B
- Laser interlocks on applicable laboratory doors
- Emergency stops on motorised equipment
- Spill kits for chemical emergencies

VENTILATION/ENVIRONMENTAL CONTROLS:
- Building HVAC system provides general ventilation
- Room 116B: temperature control via air recirculation with CO_2 monitoring
- Local exhaust ventilation or fume cupboards for chemical work (as specified in Chemical Handling RA/SWP)
- 3D printer room (116C) has dedicated ventilation
- Some laboratories may have additional air purification or filtration

List step by step instructions or order for undertaking the task

BEFORE STARTING - CRITICAL ACCESS REQUIREMENTS (you MUST meet these requirements before accessing SAIL laboratories):

Complete SAIL Lab General Local Induction:
- Delivered by authorised assessor (see Staff Approved to Assess Competence)
- Covers all hazards and controls in this SWP
- Includes emergency procedures and location familiarisation
- Sign-off required on competency sheet

Swipe card access granted ONLY after:
- Induction completed and signed off
- Supervisor approval obtained
- Access added to authorised users list
- Your name appears on door signage (if applicable)

Additional requirements for laser work:
- Laser Operator Certificate completed
- Certificate uploaded to Faculty "My Inductions Dashboard"
- Equipment-specific laser RA/SWP reviewed and signed off

Undergraduate students MUST:
- Complete all above requirements PLUS
- Have designated supervisor assigned
- Never work unsupervised - supervisor must be physically present in laboratory
- Sign in/out with supervisor for each session

Equipment-specific requirements:
- Read and understand equipment-specific RA/SWP before use
- Complete equipment-specific training and competency assessment
- Be listed on authorised users list for that equipment

PRE-ACCESS CHECKS (EVERY TIME YOU ENTER A LABORATORY):

Check door signage before entering:
- Read hazards listed on authorised entry sign
- Note required PPE for the laboratory area
- Check for laser warning signs or active laser indicators
- If laser interlock system present, check status before opening door

If laser interlock is active (laser in use inside):
- Do NOT open door without permission from person operating laser
- Knock or call to alert people inside
- Wait for laser to be shut down or made safe before entering
- Never bypass or defeat interlocks

Don appropriate PPE before entering:
- Safety glasses (as required by door signage)
- Closed-toe shoes (verify before entering)
- Laboratory coat if required
- Any additional PPE indicated on door signage

Enter laboratory and perform visual sweep:
- Look for any obvious hazards (spills, damaged equipment, trip hazards)
- Check for unusual smells (chemical leaks, burning, smoke)
- Listen for unusual sounds (alarms, equipment malfunctions)
- If anything unusual: report to supervisor before proceeding

Room 116B specific checks (CRITICAL):
- Check CO2 alarm is functional (green status light)
- NEVER close door if you are working in the room
- If door must be closed for temperature control: evacuate room
- Only access briefly to check equipment if door closed
- If alarm sounds: evacuate immediately

For undergraduate students:
- Locate your supervisor and sign in for the session

- Supervisor must acknowledge your presence
- Supervisor must remain in laboratory throughout your session
- Never commence work until supervisor present

SETTING UP YOUR WORKSPACE:

Select appropriate work area:
- Choose optical bench or workspace suitable for your task
- Ensure adequate space for equipment and safe working
- Check area is clean and clear of obstructions
- Verify adequate lighting for your task

Inspect work area:
- Check optical bench surface is clean and undamaged
- Verify mounting holes and slots are not blocked
- Check for any existing equipment or experiments
- If area occupied: coordinate with other users or select different area

Gather required equipment and materials:
- Collect only what you need for current task
- Check equipment condition before use
- Report any damaged equipment immediately
- Keep work area organised and uncluttered

Set up power and utilities:
- Visually inspect power cords and plugs before connecting
- Check for damage, exposed wires, or loose connections
- If damaged: DO NOT USE - tag as defective and report
- Do not overload power points
- Use power strips/boards with overload protection
- Route cables to avoid trip hazards (along walls, under benches, or use cable protectors)

Prepare for optical/laser work:
- Remove reflective items (watches, jewellery, lanyards, ID badges)
- Ensure hair is tied back if working near moving equipment
- Remove or secure loose clothing
- Position yourself comfortably (adjust chair height, bench access)

Chemical handling preparation (if applicable):
- Consult Chemical Handling RA/SWP
- Review Safety Data Sheets (SDS) for chemicals in use
- Verify adequate ventilation or access to fume cupboard
- Gather appropriate PPE (chemical-resistant gloves, face shield if needed)
- Prepare spill kit location (know where it is)

SAFE WORKING PRACTICES - GENERAL CONDUCT:

Maintain awareness:
- Be conscious of others working nearby
- Alert others before activating equipment that may affect them (bright lights, movement)
- Respect active experiments and equipment in use
- Ask before touching or adjusting others' equipment

Housekeeping throughout work:
- Keep work area tidy and organised
- Return tools and equipment to storage when finished
- Clean up spills immediately
- Dispose of waste properly (see Clean Up section)
- Do not block walkways, exits, or emergency equipment

Food and drink prohibition:
- No food or drink in any laboratory area
- No storage of food in laboratory refrigerators
- Use designated eating areas (e.g., Room 121A breakout room)
- Wash hands before eating after laboratory work

Mobile phone and electronic device use:
- Keep phone on silent or vibrate to avoid disturbing others
- Minimise phone use during laboratory work (stay focused)
- No photography of others without permission
- Some areas may prohibit phones near sensitive equipment

SAFE WORKING PRACTICES - OPTICAL WORK SAFETY:

Before activating any light source or laser:
- Ensure area is clear of unnecessary personnel
- Check beam path will not expose others
- Alert others in area that you are activating a light source
- Use lowest intensity possible for alignment
- Have beam blocks or shutters ready

During optical alignment:
- Never look directly into any beam or bright source
- Use beam viewing cards, cameras, or power meters to visualise beams
- Position work at or below sitting height where possible
- Be aware of all potential specular reflection surfaces
- Use beam dumps for unwanted beams
- Work systematically to track all beam paths

Laser-specific safety (in addition to equipment-specific RA/SWP):
- Verify laser safety eyewear is appropriate for wavelength and class
- Wear laser safety eyewear as specified by equipment RA/SWP
- Never bypass laser interlocks
- Never point laser at persons or reflective surfaces
- Use lowest power setting possible for alignment
- Block beam when not actively aligning
- Respect laser warning signs and restricted areas
- If laser interlock trips: investigate cause before resetting

Managing specular reflections:
- Remove watches, jewellery, and reflective accessories before optical work
- Position mirrors and optical components carefully
- Use anodised or black optical mounts to minimise stray reflections
- Cover or remove unnecessary reflective surfaces from work area
- Be conscious of beam path at eye level
- Use protective barriers or curtains if reflections unavoidable

Working in low-light conditions:
- Maintain adequate lighting for safe movement
- Use red lighting for dark-adapted work (less disruptive to night vision)
- Use torch or headlamp to navigate if needed
- Allow time for eyes to adjust when entering/leaving dark areas
- Never work alone in darkened laboratories
- Ensure emergency exits remain visible

SAFE WORKING PRACTICES - ELECTRICAL SAFETY:

Before using electrical equipment:
- Visual inspection of equipment, cords, and plugs
- Check for damage, fraying, exposed wires
- Verify equipment is test and tagged (current date sticker)
- If damaged or out of test date: DO NOT USE - tag as defective

During electrical work:
- Follow Electrical Safety RA/SWP for specific procedures
- Never work on live circuits unless qualified and authorised
- Turn off and unplug equipment before opening enclosures
- Never use electrical equipment in wet conditions
- Do not defeat interlocks or safety switches

- Use RCD-protected circuits for high-risk equipment
- Know location of emergency power shut-off

High voltage equipment (if applicable):
- Additional training and authorisation required
- Follow equipment-specific RA/SWP
- Warning signs must be displayed
- Restricted access to qualified personnel only

SAFE WORKING PRACTICES - CHEMICAL SAFETY:

Before using chemicals:
- Follow Chemical Handling RA/SWP
- Review Safety Data Sheets (SDS)
- Verify adequate ventilation
- Gather appropriate PPE

During chemical work:
- Use minimum quantities necessary
- Label all containers clearly (contents, date, name)
- Never store in unmarked containers
- Use fume cupboard for volatile or hazardous chemicals
- Wear chemical-resistant gloves and safety glasses
- Avoid skin contact - wash hands after handling
- No naked flames near flammable solvents
- Clean up spills immediately

Chemical storage:
- Return chemicals to designated storage areas
- Segregate incompatible chemicals
- Store flammables in flammables cabinet
- Keep containers closed when not in use
- No storage on floor or blocking exits

SAFE WORKING PRACTICES - FIBRE OPTICS WORK (ROOMS 121D, 218G):

Sharps hazard from cleaved fibres:
- Follow Fibre Optics Handling RA/SWP
- Wear safety glasses during cleaving
- Dispose of fibre offcuts immediately in sharps container
- Never leave cleaved fibres on bench
- Inspect hands and work area for fibre fragments
- Portable eyewash readily accessible

SAFE WORKING PRACTICES - MANUAL HANDLING:

Before lifting or moving heavy items:
- Assess load (weight, size, balance, grip points)
- If over 15 kg or awkward: use mechanical aid (trolley, hoist) or get assistance
- Plan route before lifting
- Clear pathway of obstacles

Proper lifting technique:
- Stand close to load
- Bend knees, keep back straight
- Grip firmly with whole hand
- Lift smoothly using legs, not back
- Keep load close to body
- Do not twist - move feet to turn
- Lower load carefully using same technique

Two-person lifts:
- Communicate clearly ("ready, lift on three...")
- One person coordinates

- Lift and move in unison
- Both persons must be comfortable with the lift

Moving heavy optical tables or large equipment:
- Steel-toe boots recommended
- Minimum two persons
- Use lifting equipment (jacks, trolleys)
- Secure load before moving
- Clear pathway completely
- Move slowly and carefully
- Watch for pinch points

SAFE WORKING PRACTICES - WORKING ALONE:

If you must work alone (avoid for high-risk tasks):
- Inform supervisor or colleague of your plans
- Provide expected duration and location
- Keep mobile phone accessible
- Check in periodically (text/call when leaving)
- Do NOT conduct high-risk activities alone: Class 4 laser operation; working at height; handling large quantities of hazardous chemicals; entering confined spaces; any work with significant injury risk

Buddy system encouraged:
- Work with colleague when possible
- Especially for after-hours or high-risk work
- Mutual monitoring and assistance
- Faster emergency response if needed

SAFE WORKING PRACTICES - ATTENDANCE AND SUPERVISION:

Equipment left running unattended:
- Generally prohibited unless equipment RA/SWP specifically allows it
- If equipment can be left unattended: door signage or warning sign must indicate equipment running; emergency contact information displayed; regular check-ins scheduled; automatic shutdown or safety systems functional
- Never leave Class 3B or 4 lasers running unattended

Undergraduate supervision:
- Supervisor must be physically present in laboratory at all times
- Supervisor responsible for student safety and conduct
- Student must sign in/out with supervisor for each session
- Supervisor verifies safe practices and provides guidance

COMPLETING WORK AND LEAVING THE LABORATORY:

Shutdown equipment:
- Follow equipment-specific shutdown procedures
- Turn off light sources and lasers
- Power down electronics in proper sequence
- Allow equipment to cool if necessary
- Close protective covers or shutters

Secure optical setups:
- If leaving setup overnight or longer: block all beams with shutters or beam blocks; label experiment with name, date, contact; note any hazards on label; cover sensitive components if needed (dust protection)
- Do NOT leave Class 3B or 4 lasers unattended and powered

Return equipment and tools to storage:
- Clean tools before returning
- Check items back into inventory if required
- Report any damaged or missing items
- Leave communal areas tidy for next user

Clean work area:
- Wipe down bench surface
- Remove all personal items
- Dispose of waste properly

- Check floor area for dropped items or spills
- Leave area as you found it (or better)

Chemical cleanup:
- Return chemicals to designated storage
- Ensure containers properly sealed and labelled
- Dispose of chemical waste properly (hazardous waste system)
- Remove contaminated PPE and dispose/clean appropriately
- Wash hands thoroughly

Final checks before leaving:
- Visual sweep of work area
- All equipment powered off (unless specifically approved to run)
- No trip hazards left in walkways
- Lights appropriate for room status (on/off as per lab practice)
- Emergency equipment accessible (not blocked)

Sign out:
- If using sign-in/sign-out log: record departure time
- Undergraduate students: sign out with supervisor
- Note any issues or equipment defects in log

Exit laboratory:
- Remove PPE (safety glasses can remain if worn in corridor)
- Close door securely (do not prop open unless normal practice)
- Wash hands before eating or leaving building

If last person leaving laboratory:
- Ensure all equipment powered off (except approved equipment)
- Check all lights appropriate for unoccupied state
- Verify door will lock when closed (swipe card access)
- Room 116B: verify door closed and CO2 system active
- Notify security if working very late (after hours sign-out)

VISITOR MANAGEMENT:

If you are hosting a visitor:
- Visitor must be signed in (visitor log or your supervision)
- You are responsible for visitor safety
- Brief visitor on hazards and safety rules
- Provide appropriate PPE (safety glasses, closed-toe shoes required)
- Visitor must remain with you at all times (supervised)
- Visitor must not operate equipment unless specifically trained and authorised
- Explain emergency procedures and exit routes

If you encounter an unknown visitor:
- Politely ask if they need assistance
- If unescorted: direct them to sign in or find their host
- If suspicious or unwilling to identify: contact security or supervisor
- Do not leave laboratory unattended with unknown visitors

List emergency shutdown procedures

GENERAL EMERGENCY - STOP ALL WORK AND INITIATE EMERGENCY PROCEDURES IF:
- Fire alarm sounds
- Fire or smoke detected
- Equipment malfunction or unusual sounds/smells
- Safety system failure (interlock, emergency stop, alarm)
- CO2 alarm sounds in Room 116B
- Any injury occurs
- Chemical spill beyond immediate cleanup capability

- Electrical shock or arc flash
- Any unsafe condition you cannot immediately correct

BUILDING FIRE ALARM (EVACUATION):
Upon hearing fire alarm:
- STOP all work immediately
- Do NOT shut down equipment (leave as is unless you caused fire)
- Do NOT collect belongings
- Assist anyone needing help (but do not endanger yourself)

Exit building:
- Use nearest emergency exit (never use lifts)
- Follow exit signs
- Close doors behind you (do not lock)
- If smoke present: stay low, test doors for heat before opening

If exit route blocked:
- Use alternative exit
- If trapped: close door, seal gaps with cloth, signal for help from window

Proceed to assembly point:
- Go directly to designated assembly point (as marked in building)
- Report to fire warden
- Account for all persons under your supervision (undergraduates, visitors)
- Provide information to fire warden if you have knowledge of fire location

Do NOT re-enter building:
- Wait for all-clear from emergency services or fire warden
- Do not go back for belongings
- Remain at assembly point until accounted for

EQUIPMENT EMERGENCY SHUTDOWN:
If equipment malfunctions or operates abnormally:
- Press emergency stop button if available
- Turn off power switch/circuit breaker if safe to do so
- Unplug equipment if necessary and safe
- Do NOT attempt to fix or troubleshoot while powered

Secure the area:
- Move people away from immediate hazard
- Block access to equipment if needed
- Post warning sign if leaving area unattended

Report and document:
- Report to supervisor immediately
- Tag equipment as defective (lockout/tagout)
- Complete incident report if safety-related
- Do NOT use equipment until inspected and cleared by supervisor

ROOM 116B CO2 ALARM:
If CO2 alarm sounds:
- Evacuate room immediately
- Do NOT delay to shut down equipment
- Close door behind you
- Restrict access to room

Alert supervisor:
- Contact Chris Betters, Sergio Leon-Saval, Barnaby Norris, or Julia Bryant immediately
- Notify building manager
- Await confirmation that CO2 levels normal before re-entry

If someone shows CO2 exposure symptoms (headache, dizziness, confusion, rapid breathing):
- Remove person from room to fresh air immediately
- If unconscious: call 000 immediately
- Monitor breathing and consciousness
- Keep person calm and still
- Seek medical attention for moderate/severe symptoms

After alarm clears:
- Supervisor or building manager must verify system operational

- Investigate cause (door closed, sensor malfunction, ventilation failure)
- Complete RiskWare incident report

List Emergency procedures for how to deal with fires, spills or exposure to hazardous substances

FIRE EMERGENCY - SMALL, CONTAINED FIRE (waste bin, small electrical):
Alert others and assess:
- Shout "Fire!" to alert others in area
- Assess: can it be safely extinguished? Is appropriate extinguisher available? Do you have clear escape route?
If safe to fight fire:
- Send someone to activate fire alarm and call 000
- Locate appropriate fire extinguisher: dry powder (ABE) - general purpose, most fires; CO2 - electrical fires, electronics; water - paper/wood only (NEVER on electrical or chemical fires)
- Check pressure gauge in green zone
- PASS method: Pull pin, Aim at base of flames (not flames themselves), Squeeze handle, Sweep side to side
If fire does NOT extinguish immediately:
- EVACUATE - do not continue fighting
- Close door behind you (do not lock)
- Activate fire alarm if not already done
- Proceed to assembly point

FIRE EMERGENCY - LARGE OR SPREADING FIRE:
- Evacuate immediately
- Close doors (do not lock)
- Activate fire alarm (break glass at pull point)
- Call 000 (Emergency Services)
- Notify fire warden
- Proceed to assembly point
- Do not re-enter building

CHEMICAL SPILL - SMALL (<500 mL, NON-HAZARDOUS):
- Alert others in area
- Ventilate if safe (open doors/windows, turn on extraction)
- Don appropriate PPE (gloves, safety glasses, lab coat)
- Use spill kit to absorb and contain: surround spill with absorbent material; work from outside toward centre; pick up saturated absorbent carefully
- Place contaminated materials in chemical waste bag
- Clean area with appropriate cleaning agent
- Dispose of waste via hazardous waste system
- Report spill to supervisor

CHEMICAL SPILL - LARGE OR HAZARDOUS CHEMICAL:
- Evacuate area immediately
- Alert supervisor: Chris Betters, Sergio Leon-Saval, Barnaby Norris, or Julia Bryant
- Call University Security: [Insert number]
- Close doors to contain vapours (do not lock)
- Restrict access - post warning signs
- Provide SDS to emergency responders
- Do NOT attempt cleanup unless trained and equipped
- Complete RiskWare incident report

CHEMICAL EXPOSURE - EYE CONTACT:
- Immediately flush eyes with water for 15-20 minutes
- Use portable eyewash (fibre labs) or emergency eyewash station
- Hold eyelids open during flushing - ensure water flows over entire eye surface
- Remove contact lenses if possible during flushing
- Continue flushing while someone calls for medical assistance
- Seek medical attention (emergency department for corrosive chemicals)
- Bring SDS to medical facility

CHEMICAL EXPOSURE - SKIN CONTACT:
- Remove contaminated clothing immediately (cut off if necessary)
- Flush affected area with water for 15-20 minutes
- Use safety shower for large area contamination
- Do NOT apply creams, ointments, or neutralising agents
- Seek medical attention for: large contaminated area; persistent pain or redness; corrosive or highly toxic chemicals; any burns or blistering
- Bring SDS to medical facility

CHEMICAL EXPOSURE - INHALATION:
- Move person to fresh air immediately
- Loosen tight clothing
- Keep person calm, still, and warm
- If breathing difficulty: call 000 immediately
- If breathing stops and you are trained: begin CPR
- Provide SDS to emergency services
- Seek medical attention for significant exposure

CHEMICAL EXPOSURE - INGESTION:
- Call 000 or Poisons Information Centre: 13 11 26 immediately
- Do NOT induce vomiting unless directed by medical professional
- Rinse mouth with water (do not swallow)
- Do NOT give anything to drink unless directed
- Keep person calm and monitor
- Provide SDS to emergency services

ELECTRICAL SHOCK:
Person in contact with electrical source:
- DO NOT TOUCH the person - you may be shocked
- Turn off power at source if safe to do so (switch off equipment, pull plug if accessible, shut off circuit breaker)
- If cannot turn off: use non-conductive object (dry wood, plastic) to separate person from source
- Call 000 immediately
After person separated from electricity:
- Check responsiveness and breathing
- If unconscious but breathing: place in recovery position, monitor
- If not breathing and you are trained: begin CPR immediately
- Continue CPR until help arrives or person recovers
- Treat any burns (cool with water, cover with clean dressing)
- Keep person still and warm
- All electrical shocks require medical evaluation (delayed effects possible)
Equipment isolation:
- Tag equipment as defective; lockout equipment to prevent use
- Report to supervisor and facilities immediately; complete incident report
- Do NOT use until inspected by qualified electrician

THERMAL BURNS:
- Remove from heat source immediately
- Cool affected area with running cool (not ice-cold) water for 20 minutes
- Remove jewellery or tight clothing near burn (unless stuck to skin)
- Do NOT burst blisters or apply creams/ointments
- Cover burn with clean, non-fluffy material (cling film ideal)
- Seek immediate medical attention if: burn larger than 20p coin (5 cm or more); burn on face, hands, feet, joints, or genitals; full thickness burn (white or charred skin); extensive blistering; victim is child or elderly; chemical or electrical burn; unsure of severity

LASER EYE EXPOSURE (SUSPECTED):
- Stop laser operation immediately
- Move person away from laser area
- Do NOT rub eyes
- Record details: laser wavelength, class, power; estimated exposure duration; beam characteristics (direct, reflection, diffuse)
- Seek immediate medical attention (even if no pain - retinal damage may not be immediately apparent)
- For Class 3B or 4 lasers: go to hospital emergency department immediately

- For Class 2 or 3R: arrange ophthalmological examination within 24 hours
- Provide laser safety information to medical staff
- Call supervisor immediately
- Complete RiskWare incident report
- Do NOT resume laser operation until incident reviewed

INJURY REQUIRING FIRST AID:
- Assess situation - ensure area safe
- Call for first aider or trained personnel
- First aid kit location: same level as laboratories, near parents room (outside laboratory areas)
- For serious injuries: call 000 immediately
- Provide comfort and reassurance
- Do NOT move injured person unless necessary for safety

After first aid treatment:
- Complete first aid documentation
- Report to supervisor immediately
- Complete RiskWare incident report
- Accompany to hospital or arrange transport if medical treatment required
- Notify next of kin if serious injury

EQUIPMENT MALFUNCTION:
- Press emergency stop (if available)
- Isolate power if safe to do so
- Move people away from hazard
- Do NOT attempt repairs
- Tag equipment as defective (lockout/tagout)
- Restrict access
- Report to supervisor immediately
- Complete incident report if safety-related
- Equipment NOT used until inspected and cleared

EMERGENCY CONTACTS:
- Emergency Services (Fire, Ambulance, Police): 000
- Poisons Information Centre: 13 11 26
- University Security (after hours/weekends): [Insert number]
- Chris Betters (Supervisor): [Insert number]
- Sergio Leon-Saval (Supervisor): [Insert number]
- Barnaby Norris (Supervisor): [Insert number]
- Julia Bryant (Supervisor): [Insert number]
- School of Physics Safety Officer: [Insert number]
- Building Fire Warden: [Insert name and number]
- First Aid Officers: [Insert names and contact details]

List Clean up and waste disposal requirements

DAILY HOUSEKEEPING - WORK AREA:
- Wipe down optical bench or work surface
- Return all tools and equipment to storage
- Coil cables neatly (no trip hazards)
- Remove personal items
- Check floor for dropped components or debris
- Leave area tidy for next user

DAILY HOUSEKEEPING - LABORATORY GENERAL:
- Keep walkways and exits clear
- Return emergency equipment to proper location if moved
- Do not block fire extinguishers or emergency equipment
- Report any housekeeping issues to supervisor

WASTE DISPOSAL - GENERAL WASTE:
- Paper, packaging, non-contaminated materials
- Use general waste bins
- Recyclable materials in recycling bins (check local procedures)

WASTE DISPOSAL - OPTICAL WASTE:
- Broken optical components; damaged lenses, mirrors, filters
- Package safely (prevent cuts from sharp edges)
- Dispose in general waste unless chemically contaminated

WASTE DISPOSAL - FIBRE OPTIC WASTE (ROOMS 121D, 218G):
- Cleaved fibre ends are sharps
- Dispose immediately in designated sharps containers
- Never leave on bench or in general waste
- Follow Fibre Optics Handling RA/SWP

WASTE DISPOSAL - CHEMICAL WASTE:
- Contaminated wipes, gloves, absorbent materials; used solvents and cleaning agents; expired or unwanted chemicals
- Follow Chemical Handling RA/SWP
- Use university hazardous waste system
- Label clearly: contents, date, your name
- Store in designated chemical waste area until collection
- Never pour down sink unless specifically approved

WASTE DISPOSAL - ELECTRICAL/ELECTRONIC WASTE:
- Broken equipment, components, circuit boards, batteries
- Do NOT dispose in general waste
- Contact facilities for e-waste collection
- Some components may contain hazardous materials

WASTE DISPOSAL - METAL AND HARDWARE:
- Screws, fasteners, small metal parts can be disposed in general waste if non-contaminated
- Reusable items should be cleaned and returned to stock

SPILL CLEANUP:
- Water or non-hazardous liquids: clean immediately with absorbent material or mop; dry floor thoroughly; use "wet floor" sign if needed
- Chemical spills: follow procedures in Emergency section; use spill kit for small spills; dispose of contaminated materials as hazardous waste

LABORATORY CLEANLINESS STANDARDS - ACCEPTABLE:
- Active experiments clearly labelled and contained
- Cables managed (along walls, under benches, or protected)
- Equipment on benches or proper storage (not floor)
- Work surfaces generally clean
- Exits and emergency equipment accessible

LABORATORY CLEANLINESS STANDARDS - UNACCEPTABLE (REPORT TO SUPERVISOR):
- Blocked exits or emergency equipment
- Trip hazards (cables across walkways)
- Food or drink in laboratory
- Unlabelled chemicals or experiments
- Spills left uncleaned
- Equipment on floor creating hazards
- Damaged equipment not tagged

List references used in the development of this SWP, e.g. codes of practice

Work Health and Safety Act 2011

Work Health and Safety Regulation 2017

AS/NZS 2243.1:2005 Safety in laboratories - Planning and operational aspects

AS/NZS 2243.2:2006 Safety in laboratories - Chemical aspects

AS/NZS IEC 60825.1:2014 Safety of laser products - Equipment classification and requirements

Risk Assessment RA-A28-SAIL-general-lab-safety (General Optical/Laser Lab Safety)

Fibre Optics Handling RA/SWP (reference when developed)

Chemical Handling RA/SWP (reference when developed)

Electrical Safety RA/SWP (reference when developed)

University of Sydney WHS policies and procedures

University of Sydney Laboratory Safety Manual

School of Physics Local Safety Procedures

Building emergency and evacuation procedures

Equipment manufacturer manuals and safety documentation

List competency required – qualifications, certificates, licensing, training - e.g. course or instruction:

MANDATORY TRAINING 1 - SAIL LAB GENERAL LOCAL INDUCTION (must be completed before laboratory access):
Duration approximately 1.5-2 hours (presentation + laboratory tour). Assessment method: attendance and participation in full induction session; demonstration of understanding through Q&A during session; practical demonstration (locate emergency equipment, identify door signage); no formal written test required; assessor must be satisfied trainee understands all safety-critical information.

INDUCTION CONTENT - HAZARD AWARENESS:
- Optical hazards (bright sources, specular reflections)
- Laser hazards (general awareness - equipment-specific training separate)
- Room-specific hazards (Room 116B CO_2, fibre lab sharps)
- Electrical hazards (240V equipment, visual inspections)
- Chemical hazards (general awareness - specific training for chemical work)
- Mechanical hazards (manual handling, moving parts)
- Slips, trips, falls (cable management, housekeeping)
- Fire hazards

INDUCTION CONTENT - LABORATORY ACCESS AND CONDUCT:
- Swipe card access system
- Door signage (hazards, PPE requirements, authorised entry)
- Undergraduate supervision requirements
- Sign-in/sign-out procedures
- Visitor management
- Working alone policies
- Housekeeping standards
- No food/drink policy

INDUCTION CONTENT - EMERGENCY PROCEDURES:
- Building evacuation (fire alarm response)
- Fire emergency (fighting small fires, when to evacuate)
- Room 116B CO_2 alarm response
- Chemical spill response
- First aid and injury response
- Emergency contact numbers
- Location of emergency equipment (extinguishers, first aid, eyewash)
- Assembly points

INDUCTION CONTENT - SAFE WORK PRACTICES:
- Pre-access checks (door signage, PPE)

- Setting up workspace safely
- Optical work safety (avoiding direct beam exposure, managing reflections)
- Cable management and trip hazard prevention
- Manual handling techniques
- Chemical handling basics (SDS, PPE, ventilation)
- Equipment inspection (cords, test tags)
- Leaving laboratory safely

INDUCTION CONTENT - LABORATORY TOUR:
- Walk through of laboratory areas (116B, 116C, 121A-D, 120, 218G-H-I)
- Location of emergency equipment: fire extinguishers (types and locations); first aid kit (near parents room); portable eyewash stations (Rooms 121D, 218G); emergency exits and assembly points; emergency contact information displays
- Room-specific features: Room 116B CO2 sensor and alarm; laser interlock systems; 3D printer room ventilation
- Location of reference materials (RAs, SWPs, SDS)

INDUCTION CONTENT - DOCUMENTATION AND REPORTING:
- Incident reporting via RiskWare
- Equipment defect reporting
- When to report to supervisor
- Maintaining training records

MANDATORY TRAINING 2 - LASER OPERATOR CERTIFICATE (for laser work):
Required for: all personnel working with lasers; all personnel working in areas where lasers are operated; anyone who may be exposed to laser radiation.
Content: laser safety principles and regulations; laser classification system; biological effects of laser radiation; laser safety controls (engineering, administrative, PPE); laser safety eyewear selection and use; emergency procedures for laser exposure.
Provider: external certified laser safety training provider, OR internal certified laser safety instructor (if available).
Documentation: certificate must be uploaded to Faculty "My Inductions Dashboard"; copy provided to supervisor; valid indefinitely (unless changed by university policy).
NOTE: Laser Operator Certificate is GENERAL laser safety awareness. Equipment-specific laser systems require ADDITIONAL training via equipment-specific RA/SWP.

MANDATORY TRAINING 3 - EQUIPMENT-SPECIFIC TRAINING (before using any equipment):
- Read equipment-specific RA/SWP thoroughly
- Complete equipment-specific training (hands-on demonstration)
- Competency assessment by authorised assessor
- Sign-off on equipment-specific competency sheet
- Name added to authorised users list for that equipment
Examples: Bambu Lab H2D Laser Edition (RA-A28-SAIL-bambu-h2d, SWP-A28-SAIL-bambu-h2d); CMS Combiner Manufacturing System (RA-A28-SAIL-218G-3sae-cms, SWP-A28-SAIL-218G-3sae-cms); Form 3 printers; specific laser systems (Class 3B, Class 4); high voltage equipment; other specialised equipment

MANDATORY TRAINING 4 - SPECIALIST ACTIVITY TRAINING (as applicable):
- Fibre Optics Handling: required for fibre cleaving, splicing, handling; follow Fibre Optics Handling RA/SWP; training on sharps safety, disposal, eyewash use
- Chemical Handling: required for use of solvents, adhesives, hazardous chemicals; follow Chemical Handling RA/SWP; training on SDS interpretation, PPE selection, spill response
- Electrical Work: required for electrical repairs, modifications, high voltage work; follow Electrical Safety RA/SWP; may require formal electrical qualifications for some work

COMPETENCY ASSESSMENT - THEORY COMPONENT (Q&A session or discussion covering):
- Identification of hazards in SAIL laboratories
- Understanding of door signage and PPE requirements
- Emergency procedures (evacuation, fire, CO2 alarm)
- Room 116B door closure prohibition
- Undergraduate supervision requirements
- When to report incidents or defects
- Location of emergency equipment

COMPETENCY ASSESSMENT - PRACTICAL COMPONENT (trainee demonstrates):
- Ability to read and interpret door signage
- Location of fire extinguisher nearest to work area (and type)

- Location of first aid kit
- Location of emergency exits and assembly points
- Location of portable eyewash (if working in fibre labs)
- Understanding of Room 116B CO2 hazard (if applicable)
- Appropriate PPE for laboratory entry

COMPETENCY ASSESSMENT - PASS CRITERIA:
- Trainee demonstrates clear understanding of all safety-critical topics
- Trainee can locate all emergency equipment
- Trainee understands when and how to respond to emergencies
- Trainee understands room-specific hazards relevant to their work
- Assessor is satisfied trainee can work safely in SAIL laboratories

If not yet competent: additional discussion and clarification; re-walk laboratory tour; reassess understanding; if significant gaps, schedule additional training session. Do NOT grant access until competent.

ONGOING REQUIREMENTS - REFRESHER TRAINING:
- Every 3 years for all laboratory users
- Can be abbreviated refresher (1 hour) if no significant changes
- Full re-induction if major changes to laboratories or procedures
- Earlier refresher if: incident involving the person; unsafe practices observed; procedures significantly updated; extended absence from laboratories (>2 years)

ONGOING REQUIREMENTS - OTHER:
- Equipment-specific refreshers: as specified in equipment-specific RA/SWP (typically annually or when procedures updated)
- Laser Operator Certificate: valid indefinitely (current university policy); re-certification required if policy changes
- Continuous improvement: participate in safety meetings and discussions; report hazards and near-misses; contribute to procedure improvements; stay informed of safety updates

RECORD KEEPING (training records maintained by supervisors):
- Date of SAIL Lab General Local Induction; assessor name and signature
- Laser Operator Certificate (copy or confirmation of upload to Faculty system)
- Equipment-specific training dates and sign-offs
- Refresher training dates
- Authorised users lists (by equipment)

Records retention: minimum 7 years (WHS regulation requirement); active personnel records updated regularly; training database or spreadsheet maintained; access to records for audits and compliance checks

AUTHORISED ASSESSOR REQUIREMENTS (to be authorised as an induction assessor, staff must):
- Have completed SAIL Lab General Local Induction themselves
- Be thoroughly familiar with all SAIL laboratory areas and hazards
- Understand emergency procedures and equipment locations
- Have authority to grant laboratory access
- Be competent in identifying unsafe practices
- Be approved by laboratory management or School of Physics Safety Officer

Additional authorised assessors may be added with approval from the listed supervisors.

ASSESSMENT PROCESS (FOR ASSESSORS):
1. Schedule induction session (allow 1.5-2 hours; ensure laboratory areas accessible for tour)
2. Deliver induction content: present all required topics; conduct laboratory tour; demonstrate emergency equipment locations; discuss room-specific hazards relevant to trainee's work; allow time for questions
3. Assess competency: Q&A on safety-critical topics; practical demonstration (locate emergency equipment); verify understanding; identify gaps requiring additional training
4. If competent: sign trainee off on sign-off sheet; add trainee to authorised users list; arrange swipe card access activation; provide trainee with copy of RA-A28-SAIL-general-lab-safety and SWP-A28-SAIL-general-lab-safety; inform trainee of additional requirements (Laser Operator Certificate, equipment-specific training)
5. If not yet competent: provide additional training and clarification; schedule reassessment; do NOT grant access until competent
6. Record keeping: maintain training record (name, date, assessor, outcome); update authorised users list; file signed competency sheet; track refresher training due dates

AUTHORISED USERS LIST MAINTENANCE:
- Maintained by laboratory supervisors
- Updated when new users inducted and when users leave (access removed)

- Reviewed annually to ensure current
- Available for reference (who has access to which areas)

DOCUMENT REVIEW SCHEDULE (this SWP must be reviewed):
- Every 3 years (by February 2029)
- After any serious incident in SAIL laboratories
- When laboratory layouts or room uses change
- When new hazards are identified
- When procedures change significantly
- When Australian Standards or university policies are updated
- When specialist RAs/SWPs are developed (Fibre, Chemical, Electrical)

Review process: supervisors review document for accuracy and completeness; consult laboratory users for feedback; update to reflect current practices and hazards; retrain all users if major changes implemented; issue new version and update sign-off sheets

Staff approved to assess competence for this SWP

Chris Betters (Laboratory Supervisor), Sergio Leon-Saval (Laboratory Supervisor), Barnaby Norris (Laboratory Supervisor), Julia Bryant (Laboratory Supervisor)

SWP Sign off sheet	
SWP name and version:	**General Optical and Laser Laboratory Safety - All SAIL Lab Areas (Version 1.0)**

In signing this section the assessor agrees that the following persons are competent in following this SWP.

Name	Signature	Date Competent	Name of Assessor/Authoriser	Assessor/Authoriser signature

Risk Matrix

			Potential Consequences				
			Class 3	Class 2	Class 2	Class 1b/1c	Class 1a
			Minor injuries or physical discomfort. Short-term psychological impact (isolated or one-off event).	Injury or illness requiring medical treatment and/or short-term impairment (less than 2 weeks). Psychological impact requiring support.	Injury or illness requiring hospital admission and/or temporary impairment (less than 6 months). Psychological impact requiring medical treatment.	Injury or illness (physical or psychological) resulting in long-term or permanent impairment (more than 6 months). Injury or illness resulting in temporary impairment to multiple people.	One or more fatalities. Injury or illness resulting in long-term or permanent impairment to multiple people.
			Insignificant	**Minor**	**Moderate**	**Major**	**Severe**
Likelihood	Expected to occur regularly under normal circumstances	**Almost Certain**	**Medium**	**High**	**Very High**	**Very High**	**Very High**
	Expected to occur at some time	**Likely**	**Low**	**Medium**	**High**	**Very High**	**Very High**
	May occur at some time	**Possible**	**Low**	**Medium**	**Medium**	**High**	**High**
	Not likely to occur in normal circumstances	**Unlikely**	**Low**	**Low**	**Medium**	**Medium**	**High**
	Could happen, but probably never will	**Rare**	**Low**	**Low**	**Low**	**Medium**	**Medium**