Physics Lab
ETH zürich

Safety in the Physics Lab P3 / P4:

General Introduction

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ETH Zurich

Safety in the Physics Department

D-PHYS Safety Council

Chairs

Prof. Dr. Paolo Crivelli

Prof. Dr. Giacomo Scalari

Expertenteam (Sicherheitsberater)

Gebiet	Verantwortliche
Radioaktivität	Dr. Christof Vockenhuber
Laser	Dr. Tobias Donner
Gifte/Chemikalien	Dr. Lukas Wacker
Druckgase	Dursun Aydin
Flüssiggase	René Keller
Elektrizität	Milos Jovanovic
Brandschutz	TBC

Tasks of the D-PHYS Safety Council

- The Safety Council is responsible for sustainably embedding safety measures at D-PHYS.
- It supports and fosters the exchange of information between D-PHYS staff and external experts.
- It points out shortcomings regarding safety matters within D-PHYS and advises on re-medial measures.
- It acts as the main contact for D-PHYS staff concerning matters of safety and provides support in their resolution.
- Meets prior to every Department Konferenz to discuss safety relevant topics

Additional members

- 1 representative per departmental facility: designated by the coordinator (Prof. Dr. S. Huber)
- 1 representative per research group (Group Safety Representative): designated by the PI
- 1 representative from the SGU: Dr. Ines Raabe
- 1 representative from the buildings/operations division: Hans Romer

Additional consultants can be brought in, if needed.

https://www.phys.ethz.ch/de/das-departement/sicherheit/sicherheitsrat.html

How do I minimize my personal risk?

You are the first responsible for your own safety!

Before you begin an experiment:

- Study the safety instructions in the experiment manual
- Inspect the experimental setup:
  - Where are the sources of danger ?
  - Is there any protective equipment to be used ?
  - Do I know how to properly use the equipment ?
- In case of doubt ask the assistants !

While doing the experiment:

- Observe safety instructions
- Use safety equipment
- Never rush, step by step: understand what/when something is dangerous

After finishing the experiment:

- Switch off cooling water, electricity, gas, …
- make sure everything is back in a safe state
- Clean up the workplace

General rules for safe working

Set up a clear workplace

- Take with you only the required material, leave jackets / bags in lockers in the corridors (see next slide)

No eating / drinking / smoking in the lab !

Wear suitable clothing

- e.g. long trousers, closed shoes, no wide sleeves, no scarfs, …

Lockers

- **Leave all unnecessary objects in the lockers (jackets, bags, etc…)**
  - Remember to empty lockers in the evening
- **When working with liquid nitrogen (or helium):**
  - take off metallic wrist watches, rings etc… store them in the lockers
- **When working with magnetic fields:**
  - take off wrist watches, keys and any metallic object, store them in the lockers
  - leave wallet, credit cards, etc… in the locker
  - pacemakers, metal implants, watches, keys, credit cards

strong magnetic field warning sign

prohibition signs

Earth's magnetic field: ~ 0.5 Gauss
Magnetic fields in the laboratory: ~ 1 Tesla = 10'000 Gauss

General rules for safe working

- **Only authorized persons are allowed to enter the laboratories**
  - Also applies to friends/colleagues who are not in PhysicsLab 3/4
- **Never do dangerous work on your own**
  - always a 2nd person in the room present
- **Caution with soldering iron**
  - …looks cold, but can be very hot!
- **Caution with heat gun**
  - …it looks like a hair dryer but it warms up to ~600 C (your oven at home goes to 250)
  - Careful: materials can melt or catch fire !

Basic electrical dangers

- Never put fingers or other **objects** in an outlet….
- Do not overload outlets
- Never pull a plug out by its cord.
- Get rid of damaged extension cords (a quick look is worth a lot!)
- Keep electrical appliances and tools away from water
- Turn off the power to equipment before inspecting it.
- All current transmitting parts of any electrical devices must be enclosed.
- Extension cords must be connected to a power strip equipped with a fuse.

Type J

- used almost exclusively in Switzerland & Liechtenstein
- 3 pins
- grounded
- 10 A
- 220 – 240 V
- socket compatible with plug types C & J

Basic electrical dangers

Don’t do this!

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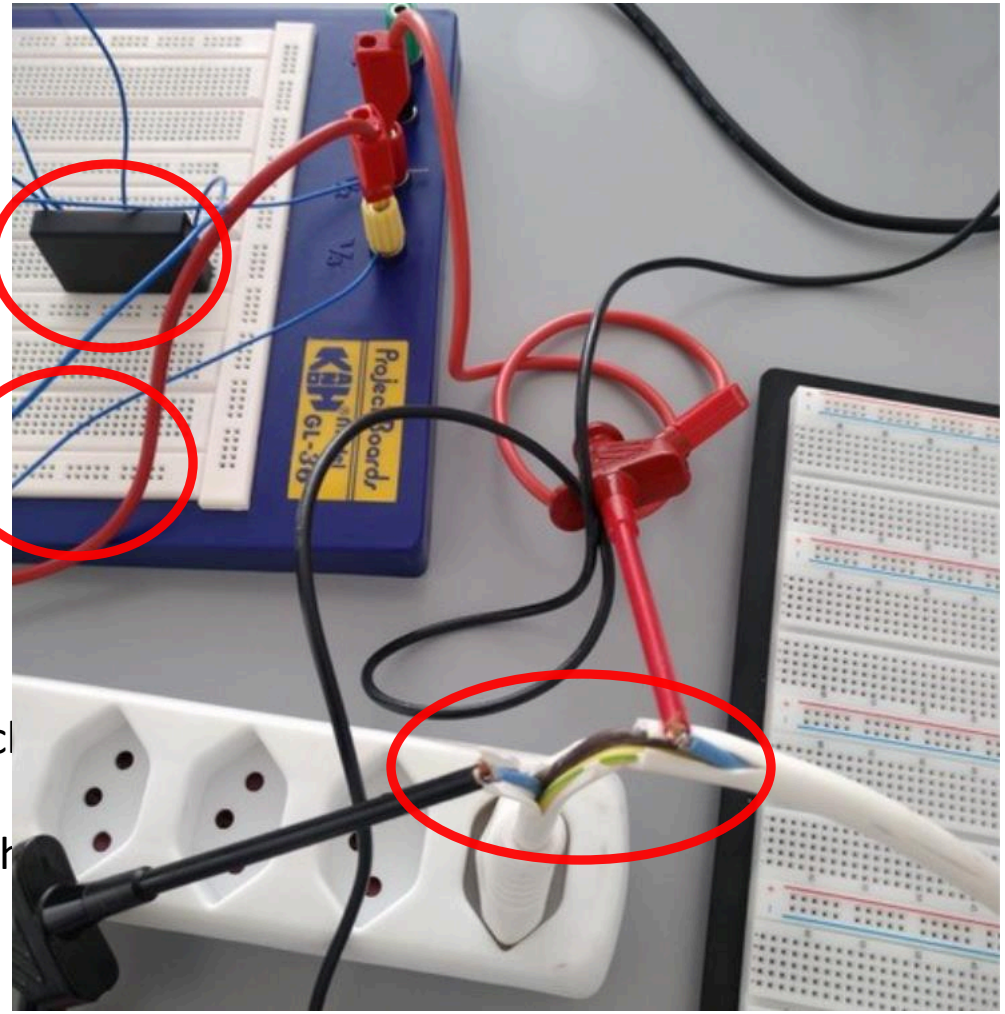
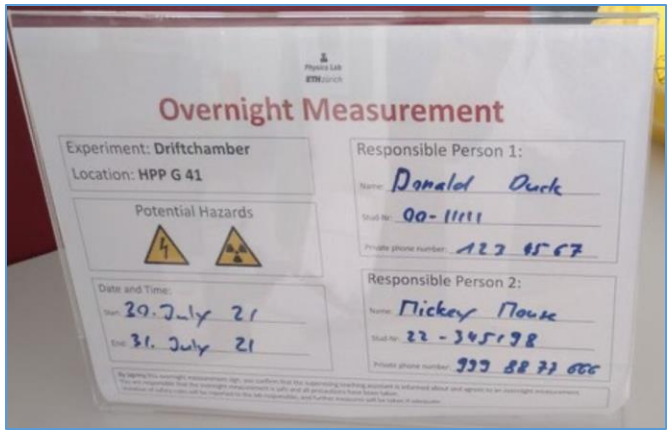


Overnight Measurements

Some experiments might need longer data taking periods, which can be extended over night

- Compton Scattering
- Environmental Radioactivity
- e+e- annihilation
- Driftchamber
- X-ray diffraction
- Gamma Spectroscopy



If you want to keep your experiment running over night, you have to fill out an **overnight measurement** sign. Else, the lab team will switch everything off (and not so gently…)

Please discuss the need for the long data taking with your TAs and fill in the form that you find on the experiment desk. This is required by SGU! If you run out of sheets, the helpdesk can help.

Suggestion: read the SUVA documentation

(on the website you can select the language)

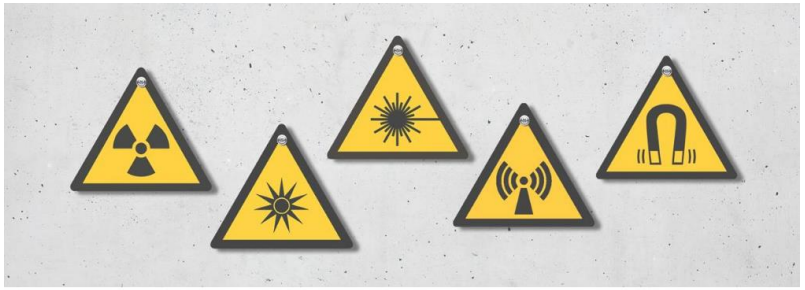
Familiarize with the SUVA website: https://www.suva.ch/

Schweizerische Unfallversicherung SUVA
Swiss National Accident Insurance Fund

Some examples in: https://www.suva.ch/material/documentations/

Laser Safety

Radiation Protection



Chemicals

End of «General Lab Safety»

Questions so far?