Safety & Health

Faculty of Physics

Version 05.05.2014

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Purpose of this Tutorial

Training about health and safety is a legal requirement.

This tutorial will lead you through the relevant topics.

Estimated time for completion of the module: 40 minutes.

The online exam takes about 10 minutes.

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Online Training Instructions

- It is mandatory to complete the tutorial and the exam at the beginning of your work (for new employees), and thereafter once a year and on request per email within 2 weeks.
- If the tutorial hasn't been completed in time, the supervisor will ask the employee to complete the tutorial within one week. He/she will take measures if this requirement is not met. In particular, for new employees successful completion of the tutorial is required to receive their keys.
- Nobody is allowed to enter any laboratory before they have successfully completed the tutorial and exam.

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General Safety Rules

General Safety Rules 1

- Safety regulations **apply to everyone present in the laboratories**, regardless of whether they are employees, students, other members of the university, guests or employees of external companies.

- You have to **inform yourself and any guests about the location and usage of protective equipment** such as

First Aid boxes

Emergency showers

Eye washes

Fire extinguishers

Escape routes

Fire alarm push button

- You have to **inform yourself about the handling of hazardous materials** as well as about the function and operation of the instruments you use, and you have to **read the material safety data sheets and operating instructions**.

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General Safety Rules 2

Personal Protective Equipment

Always use the personal protective equipment (which is provided by the employer) according to its designated purpose!

- **Use eye protection (goggles):** If you already wear corrective glasses, try to use goggles and if they don't fit wear shields over your glasses.

- **Protective clothing:** closed-toe shoes, long trousers, cotton lab coat; Do not wear shorts, skirts, T-shirts, nylons or sandals.

- **Gloves:** choose the gloves according to hazard: *toxic* – **nitrile gloves***;* *cold* – ***Cryo-gloves®****; corrosive, irritant* – **chemical resistant gloves**

- **Respiratory protection:** disposable mask; if required (e.g. vapor, aerosols): reusable half-mask respirator with filters/cartridges
- **Working with lasers:** remove anything reflective you are wearing (rings, necklaces etc.) and wear appropriate goggles (see laser safety)
- **Check specifications** of all safety equipment you are using!
  - lifetime of equipment (e.g. masks)
  - solvent specs of gloves
  - laser safety goggles
- **Exchange** old safety gear

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General Safety Rules 3

- **Eating, drinking and putting on make-up is forbidden in the laboratories**. Do not store food or drinks in the cold-room. Use the kitchens instead.

- **Smoking is forbidden** in the entire building!

- **Always follow the instructions of the safety representatives**, physicians, fire protection officers, radiation protection advisors, laser protection advisors and biological safety representatives!

- Link to further guidelines
  (fire-, lab-, and workshop regulation)

Working Alone 1

Allowed:

- Working alone at a lab workplace with a low risk of accidents is allowed only if effective monitoring is ensured – i.e. another person must be within visual and calling range in case of injury or the occurrence of damage (Article 61 Par. 6 Employee Protection Act).

Not allowed:

- Working alone at a lab workplace with an increased risk of accidents is not allowed. This is the case when a short rescue time – between 0 and 5 minutes – is critical (e.g. risk of suffocation or loss of consciousness due to effects from chemicals/gases, shock reaction after laser injury).

Increased risk of accidents: foreseeable accidents or incidents which lead to injuries to employees as well as life-threatening situations, permanent damage or unacceptable pain due to late assistance

University Safety Representatives

You will find the actual contact details here:

Safety experts

Occupational health:

Physician

Psychologist

Security manager

Herbert Dagott, MSc +43-1-4277-128 45

Safety representatives

Here, you will find a list of the responsible person for each organisational respectively.

Security team 24h/365days +43-1-4277-127 00

Persons in charge of first aid are listed on each floor at the Faculty of Physics. Contacts for further safety personell (e.g. fire prevention etc.) can be obtained from yours groups secretary.

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Pregnant Employees

Notification of pregnancy:

- Immediately inform the floor secretary and the office of the administrative director (Marion Linger or Fabien Martins). Include a medical certificate attesting the due date to calculate start and duration of maternity leave (8 weeks before and 8-12 after birth). HR will inform the Health and Safety Executive (Arbeitsinspektorat).
- The occupational physician evaluates the workplace and the activities in the lab.
- All work that may present a significant risk to the expectant mother and/or child must be avoided. In such circumstances, immediately redeploy the woman from specific high risk activities as appropriate. New workplace/tasks can be assigned to the pregnant employee.

Theft protection

Theft protection

- Call **12700** (university security team) if needed.
- Police is called by the security team.
- Exception: immediate danger for persons and goods

IMPORTANT:

ALWAYS LOCK THE ENTRANCE TO THE CORRIDORS

… during weekends

… during the week: after 19h

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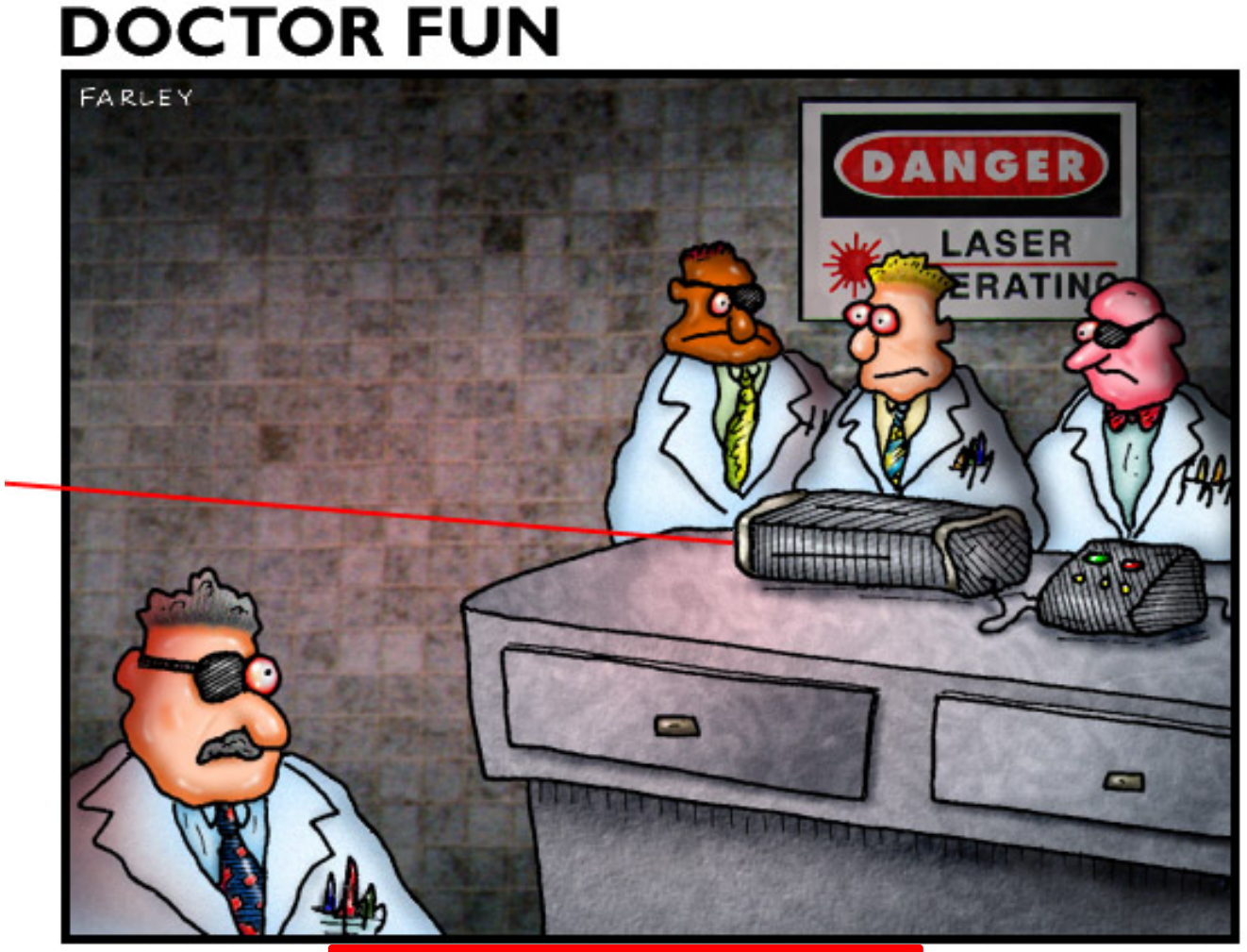
Laser Safety

About "being cool" and "peer pressure" in the laser lab



Peer pressure in the laser lab

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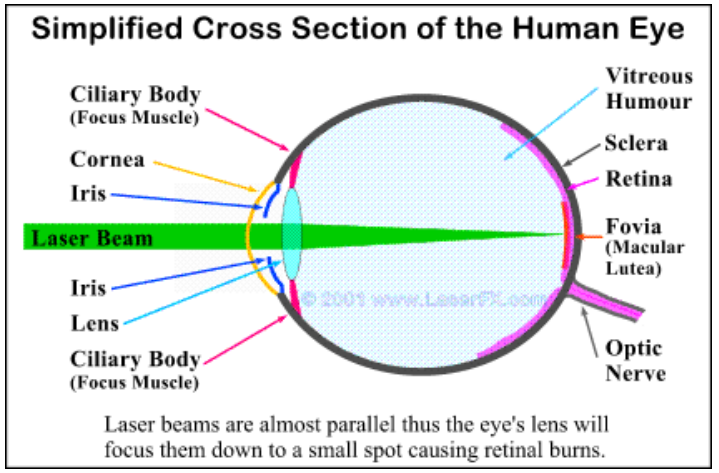
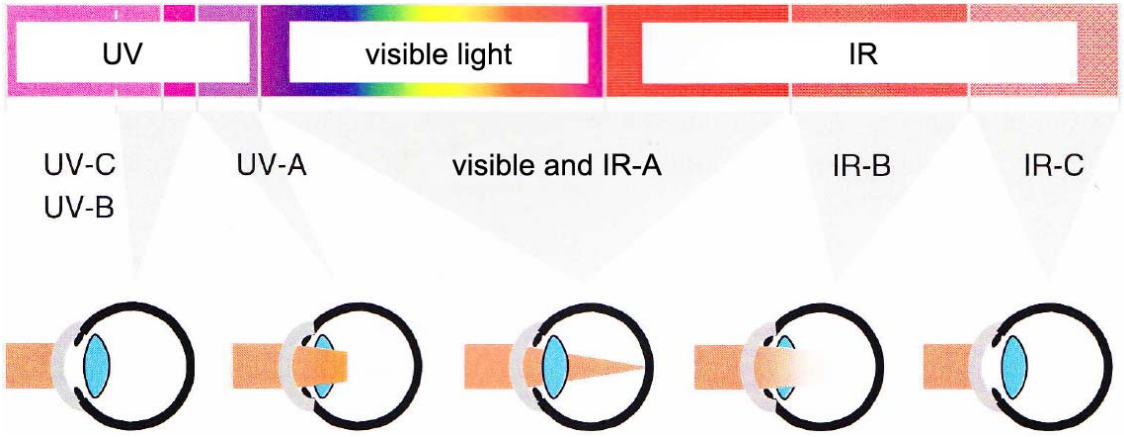
Anatomy of the Eye



- **At laser wavelength λ= 400 nm…1400 nm:**
  - Cornea, intraocular fluid, lens and vitreous humour are transparent.
  - The retina is most at risk and irreparable!
  - Particularly dangerous: λ >750 nm invisible – no blinking reaction!



At λ < 400 nm & λ > 1400 nm:

- The lens and cornea are at risk
- Minimal chance of recovery
- This wavelength is sometimes misleadingly called “eye-safe”

NB: Calling anything above a few milliwatts “eye-safe” is dangerous nonsense!
Intense laser light is always a danger!

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Classification of laser hazards by wavelength

- Relevant for non-ionizing radiation: thermal power per area as well as the specific wavelength-dependent absorption properties of tissue

- Due to the focussing of light by the eye's lens onto the retina, visible and near infrared light is particularly dangerous – damage of the retina is irreparable. In addition, as near infrared light is invisible, you will not perform protective reactions until it is too late.

- $\lambda > 1.4$ µm: Radiation is absorbed by the cornea; retina is protected – But:
  depth of absorption < 0.1 mm - for $\lambda > 3$ µm: damage of cornea

- $\lambda < 280$ nm: 2-photon ionization of various amino acids and all nucleotides possible
  → increased risk of DNA damage and cancer
- $\lambda < 400$ nm: molecular bonds can be destroyed (DNA!)
  Even low intensities can lead to increasing opacity of eye lenses and cornea (cumulative effect)!
- http://www.icnirp.de/documents/laser400nm+.pdf

Further note:

- Other intense light sources (e.g. Xe lamps etc.) can also lead to significant eye damage.
- Blue-light hazard: Constant irradiation with blue (in particular UV-C) light even at very low intensities over long times can lead to an inflammation of the conjunctiva (pink eye).

Laser Safety Classes according to European Norm EN 60825-1

Class	Power	Wavelength range	Description
1	< 40 µW blue < 400 µW red	302 nm...10^6 nm	Laser radiation is safe OR the laser beam is completely encapsulated. (No access to laser without tools.)
1M	Depending on situation	302 nm...10^6 nm	Laser radiation is safe IF not focussed by an optical device (lenses, telescope etc.).
2	≤ 1 mW	400...700 nm	Laser radiation only in the visible spectrum (400-700 nm). Eye-safe if exposure time is below 0.25 s.
2M		400...700 nm	Like class 2 IF not focussed by an optical device.
3R	5x cl. 2 visible 5x cl. 1 invisible	302 nm...10^6 nm	Laser radiation is **dangerous for the eyes** when exposure time is longer (seconds).
3B	5 to 500 mW (UV-A to IR-C) Otherwise lower.	302...10^6 nm	Even brief exposure to laser radiation is **dangerous for the eyes**.
4	> 500mW	302...10^6 nm	Laser radiation is **highly dangerous for the eyes and dangerous for the skin**. Even diffusely reflected radiation is dangerous. Fire and explosion risk when using radiation of this class.

Obligatory rules for laser lab safety

Design of your environment

- Identify laser labs (warning labels).
- For non authorized person it is strictly forbidden to enter the laser labs
- During operation of lasers of class 3b + 4 a warning light must be active and visible next to the entrance of the lab.

- Entering a lab with an active warning light is strictly forbidden
- Follow all safety instructions labeled on the device
- Install radiation protection curtains or walls with appropriate fire safety class for partitioning laser zones.

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Obligatory rules for laser lab safety

Laser safety is a shared responsibility!

- **New members** of staff should be **advised** of all the rules on their **first active day**.
- Each **individual is responsible for the safety** in his/her own area.
- **Only activate laser after** all safety precautions have been taken and all relevant personnel have been warned.
- **Block laser beam before you put in/take out optical elements.**

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When assembling new optics

- Use black (anodized) tools when working with lasers.
- Only install firmly secured optical elements into the laser line.

- Use beam catchers and screens.
- Adjust laser at the **smallest possible power!**
- Remove all jewellery and watches from your hands.
- Diffusive reflections can still have directed energy. With a class 4 laser this can have disastrous consequences.
- Computer monitors at beam height are extremely dangerous (reflections)!

Take laser safety seriously

- Never (!) put paper or solvents into the beam line of a class 3b or 4 laser!
- Use safety goggles.

- Never (!!!) move your eyes into beam height even with laser goggles on.
- **Laser safety goggles are not almighty!**
  - Maximum protection goggles will only protect for up to 5 s.
  - Goggles with cracks must be replaced.

- The goggles must be suited to all the wavelengths used in your environment.
- This effectively means that in a lab with class 3 and 4 lasers your goggles need to be suited to all wavelengths in the lab as long as no appropriate measures to separate the danger zones are taken.

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Specifications of laser goggles

- Specifications are indicated on the goggles and/or in the data sheet provided by the manufacturer

- Example: “ 1030-1065 D L6“ *

  1030-1065 …. Useable wavelengths in nm

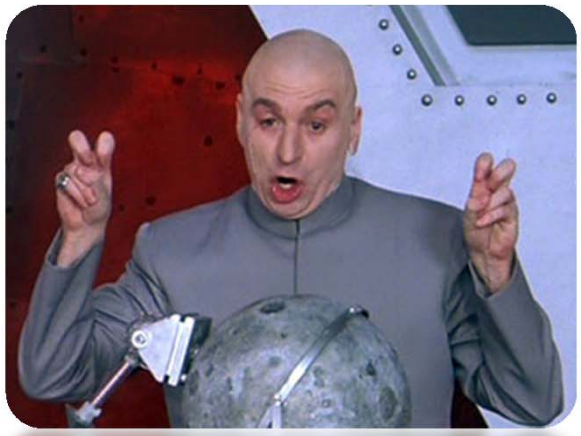
  D …. Appropriate for cw laser radiation; alternatives: I (pulsed lasers <1μs), R (Q-Switch, typically several ns), and M (mode coupled lasers, e.g. fs-pulses)

  L6 …. Goggles have an optical density (OD) of 6 and have been tested to withstand the laser radiation for at least 5 seconds (this is indicated by the L or LB) OD = 6 means intensity is reduced by 6 orders of magnitude.

- Goggles for pulsed lasers must be chosen carefully according to mean and peak power.
- Ask your safety advisor („Laserschutzbeauftragter“) if you are not sure about the required goggles!

* Additionally, the label may carry the following information: LV [Manufacturer Identification], DIN [Norm], S [Mechanical Properties]

What to do in case of an accident



- Providing first aid is essential, e.g. shock treatment! If possible – visit an ophthalmologist (eye doctor).

- Every accident or incident involving a laser has to be reported to the Laser Safety Advisor promptly!
  Wilhem Markowitsch (Faculty) - 51426
  Nikolai Kiesel (Quantum Group) - 72534

- The Laser Safety Advisor or local responsible person will initiate all further steps.

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Electricity & Safety

Electrical Hazards

- **Hazards to humans**
  - High currents can cause tissue burns.
  - DC currents can cause muscle spasms.
  - AC voltages > 50 V can cause cardiac fibrillation.
  - Currents > 50 mA have been seen to be fatal!

- **Lab Hazards**
  - Already a few volts (< 5 V) can be dangerous:
    - Batteries and steelwool
    - Wrench close to the poles of a battery

- **Maximum permissable contact voltage** (TAEV 1996 IV/1.1):
  - AC voltage: U < 50 V
  - DC voltage: 120 V

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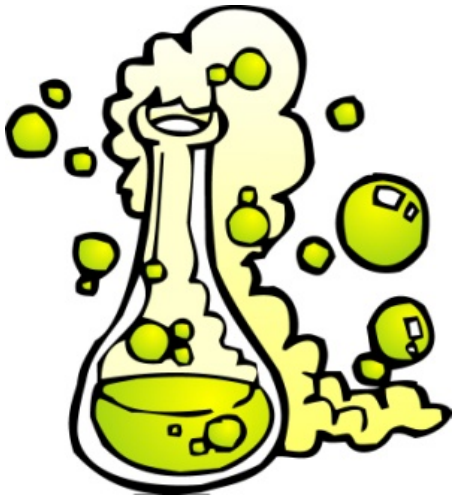
Chemical Safety

Handling of Hazardous Chemicals

- For any substance you are working with, make sure you **understand the hazards** and **inform yourself** about the **appropriate measures** that you will have to take (includes using warning signs where necessary).



- When working with **unfamiliar substances** always **consult** the:
  Material Safety Data Sheet (MSDS)

  Available at:
  http://www.hvbg.de/d/bia/gestis/icsc/index.html

- All bottles containing **chemicals** must be **appropriately labelled**. This includes chemicals you have mixed yourself.

General Rules in the Laboratory

Toxic substances**: Keep them locked** (regardless of amount)!

Corrosive chemicals: Do not store above head height!

Carry easily breakable containers in styrofoam boxes!

Fuming chemicals → manipulate under fume hood!

Vaporizing chemicals → manipulate under fume hood!

Use always your **personal protective equipment**, if necessary check the Material Safety Data Sheet.

While working with unknown or dangerous substances use:

- **Gloves and dust mask when in contact with dust emitting substances (C_{60}, carbon nanotubes etc…)**
- **Gas mask (volatile fluorine compounds, concentrated solvent vapours)**

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Hazardous Substances

old new

- **T+ – very toxic**
  Single or short exposure (via skin, airways or mouth) to these chemicals can cause **death or extremely serious acute or chronic damage to health – even at very small quantities.**

- **T – toxic**
  Exposure via skin, airways or mouth to these chemicals can cause **death or serious acute or chronic damage to health – even at small quantities.**

- **Xn – harmful**
  Chemicals that may cause limited damage to health through exposure via skin, airways or mouth.

Source: Arbeitsstoffe: Leitfaden gefährliche Arbeitsstoffe, Zentral-Arbeitsinspektorat, 4. Auflage 2012

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Hazardous Substances

old **new**

- **C – corrosive**
  Chemicals that may destroy living tissue on contact.

- **Xi – irritant**
  Chemicals that may cause inflammation of the skin or mucous membranes on contact, either instantly or after repeated exposure.

Source: Arbeitsstoffe: Leitfaden gefährliche Arbeitsstoffe, Zentral-Arbeitsinspektorat, 4. Auflage 2012

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Hazardous Substances

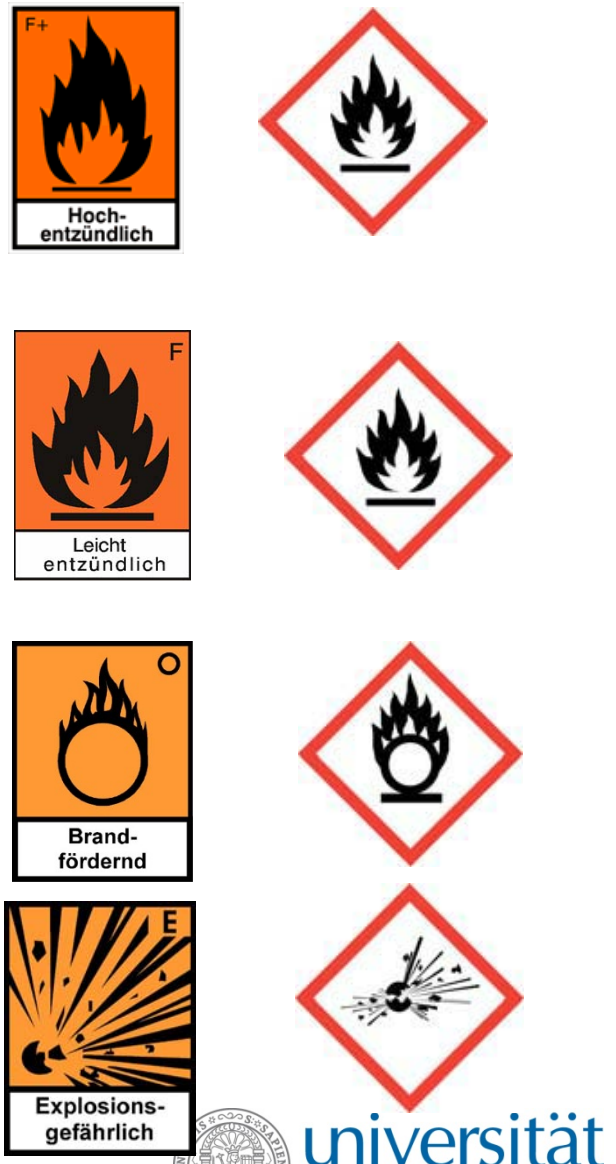
- **F+ – extremely flammable**
  Liquid chemicals that have an extremely low (under 0° C) flash point and boiling point (below 35° C), and gases that catch fire in contact with air.

- **F – flammable**
  Chemicals that may catch fire in contact with air, only need brief contact with an ignition source, have a very low flash point (under 21° C) or evolve highly flammable gases in contact with water.

- **O – oxidising**
  Chemicals that easily release oxygen and therefore facilitate ignition and burning.

- **E – explosive**
  Chemicals that explode when ignited.

Source: Arbeitsstoffe: Leitfaden gefährliche Arbeitsstoffe, Zentral-Arbeitsinspektorat, 4. Auflage 2012



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Hazardous Substances – Flammables

- Flammable chemicals must be stored in appropriate areas. Be aware that some chemicals must not be stored together (**segregation** needed, look it up in the material safety data sheet!). Storage of flammable chemicals outside an approved flammable storage cabinet must be kept to a minimum (maximal daily requirement).

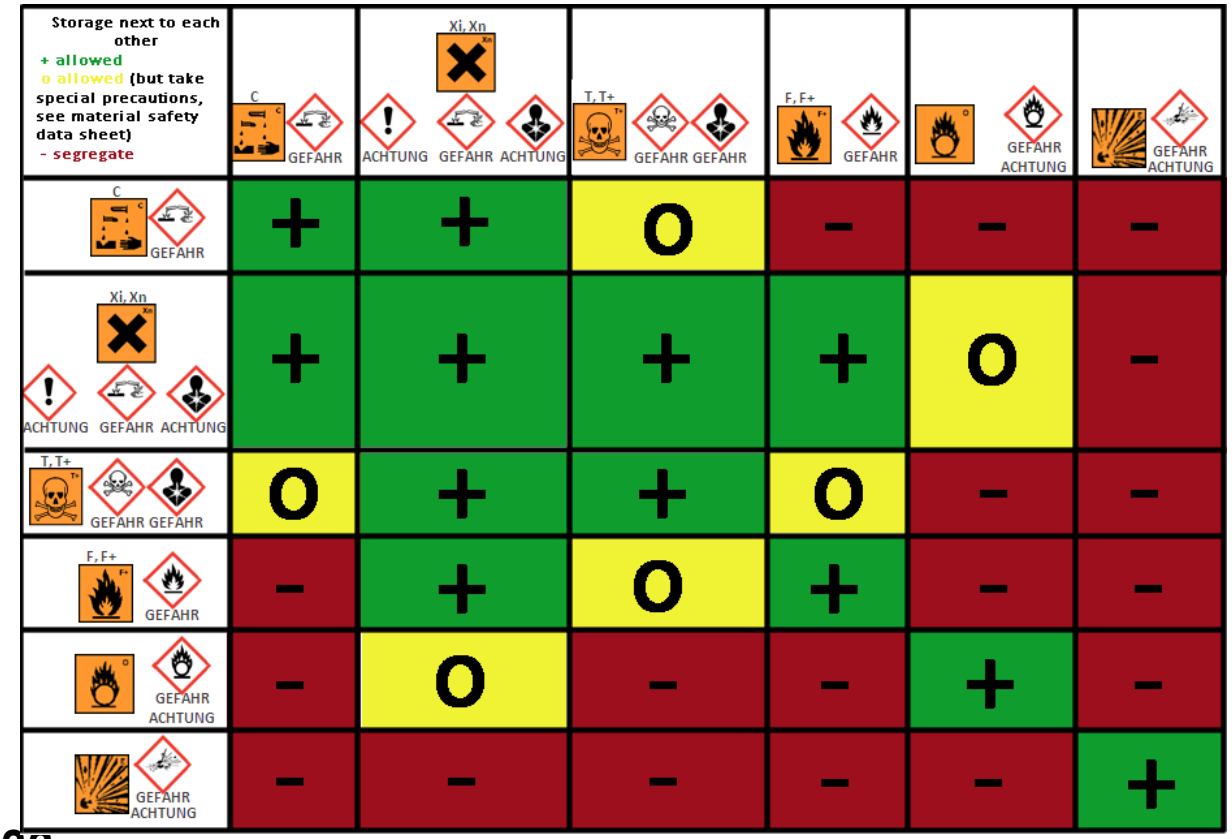
- All potential **sources of ignition** (Bunsen burners, hot plates, electrical equipment, etc.) should be **eliminated from** areas in which **flammable or combustible chemicals** are used.

- Only refrigerators and freezers approved for flammable storage (**adequate ventilation**!) should be used for storing flammable materials.

- Keep **containers** of flammables **closed at all times** when not in use.

Storage of Hazardous Substances - (In)compatibilities

- You will find the tables with the appropriate symbols along with the MSDS
- For any questions, please contact
  Petra Beckmannova (51205) or Stefan Loyer (72605)



+ Compatible: storage next to each other is allowed

- Incompatible: segregate!

O Storage together allowed (but take special precautions, see material safety data sheet)

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Working with alkalis

- Alkalis react vigorously with air, water, solvents!
  - Cesium is worst, Lithium relatively safest
- There are stories of labs that burnt down and people that were severely burnt in alkali flames.
  Take alkalis seriously!
- Handling of alkalis (Li, Na, K, Rb, Cs):
  - Only after discussing safety measures with the head of your research group
  - In general: only in protective atmosphere

Handling compressed gas cylinders 1

General

- During transport and handling of compressed gas cylinders or the handling of gas delivery system the necessary personal protective equipment must be used.
- Avoid heating of compressed gas cylinders to over 40 C (liquefied gases) or 60 C (compressed gases)
- The gas cylinders must always be secured against falling.

Transport

- Transport only with a suitable vehicle (Safety chain, vertical stand)
- Always screw cap, no transport with reduction unit on
- Never roll or drag a pressure bottle
- Only transport in the empty elevator (without people)

  Use the priority key for the elevator ride so no other person can enter.

  Priority key can be borrowed from Ms. Petra Beckmannova

Handling compressed gas cylinders 2

Storage

- Gas sensor in the space of storage.
- Pressure bottles stored upright,. Never store liquefied gases lying in passages, passages or escape routes.
- No storage of gas bottles with combustible materials.
- Storage rooms must be sufficiently ventilated and shall be marked (Gas Bottle Label, if applicable note danger of suffocation).
- Hazardous gases must be stored in special safety cabinets.
- No storage of gas bottles at the place of consumption.

Working with fluorine gas F_2

- Toxic levels:
  - Breathing F_2 at a concentration of 10 ppm in air is already dangerous
  - Most people can smell F_2 at a level of 0.1 ppm
  - The installed sensors trigger at about 1 ppm
  - 25 ppm for 5 min: eye damage
  - $LC_{50,1h}$ = 185 ppm
    Concentration that kills 50% of all affected people within 1h

F_2 kills !

- Measures
  - Use gas mask whenever you handle the F_2 line
    - Never remove the emergency mask from the lab
    - Exchange filters when required
  - Open windows when handling F_2 lines
  - F_2 bottles must be stored in vented safety boxes
  - Annual check of all gas sensors by a certified company (Dräger)
  - No handling of F_2 with inactive sensors!

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Cleaning fluids

- **HF = Hydrofluoric acid**
  - Often used in clean rooms, but extremely dangerous
  - 1 cm^3 spilled on your skin (or more than 10 x 10 cm^2) may necessitate amputation and is still likely to kill you

- **Piranha solution**
  = sulfuric acid (H_2SO_4) + hydrogen peroxide (H_2O_2),
  Piranha solution is extremely dangerous (risk of explosions)
  http://www.drs.illinois.edu/css/factsheets/pdf/PiranhaWaste.pdf

Only upon consultation with responsible Professor!

- **RCA cleaning** (dangerous):
  is actually a sequence of cleaning with HF and Piranha

- **Better**: use plasma cleaning of surfaces. In many cases sufficient: Cleaning with detergent and excessive rinsing in deionized water, drying in clean air

What to do with waste chemicals?

- Store separately and **clearly labeled** in a sealed container and only accessible to informed personnel.

- **Attention:**
  Mixing different solvents and chemicals can cause overheating or even explosions.

- **Always** clean your working place!
  (E.g. clean table, dispose of empty bottles – see below, etc.)

- Roughly twice per year chemical waste is collected. In case you require disposal, please contact:

Ing. Daniel Gitschthaler, daniel.gitschthaler@univie.ac.at

- For very small amounts you might consider for disposal: Inner yard, in direction of Faculty of Chemistry, on the left:
  "Chemie – Lagerraum", Tue and Thu, 14:00 – 15:00 hours

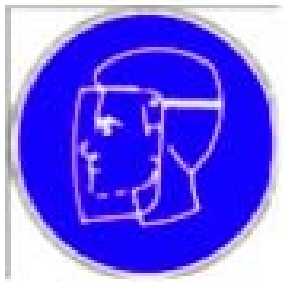
Cryogenics

- **Never touch** uninsulated pipes or vessels containing cryogenic liquids (e.g. liquid nitrogen). Your skin will stick to **extremely cold materials**. Even non-metallic materials are dangerous to touch at low temperatures!

- It is **strictly forbidden** to place dry ice (CO_2) in the cold room as it is not ventilated. Upon evaporation the room will be filled with CO_2 gas (danger of suffocation)!

- The use of cryogenic liquids is only allowed in rooms with the following sign (sufficient ventilation):

Protective Clothing



- Face shields are recommended during transfer and handling of cryogenic liquids. If severe spraying or splashing could occur, safety glasses or chemical goggles will provide additional protection.

- Always wear loose-fitting, dry leather gloves or Cryo-gloves when handling objects that come into contact with cryogenic liquids and vapour.

Working with liquid nitrogen or helium:
Danger of suffocation

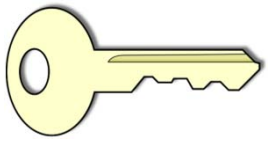
Working Environment

- Install oxygen sensor:
  Oxygen level should be 20%+, values below 19% are not safe
- The alarm must happen in an optical and acoustical way in and outside the Labs
- Post warning signs outside of the lab
- Ventilate workspace
  - Exchange lab volume 2-4 times per hour under normal use
  - Ideal: emergency ventilation: 10 x in case of gas alarm

- **In case of alarm:**
  - Open windows (if you are still able to do so) & leave the room
  - Inform the responsible persons

Elevator transport:

- liquid gases must travel alone,
  i.e. send them to their destination and take the stairs
- Start elevator transport with **override key** for secure travel.
  The key can be borrowed from Petra Beckmannova.



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Further dangers of cryogenic liquids: “explosions“

Explosion hazards

- Helium: volume increase by 700x from liquid to gas
- Safety valves must be free and de-iced
  …Also on the nitrogen tanks
- In some labs glass dewars have accidentally turned into fragmentation bombs

Radiation Safety

Radiation Safety

• Radiation protection areas and radioactive sources are marked with the radiation warning sign (pictured above).

• Entering labelled rooms is strictly forbidden for unauthorised personnel! (These rooms have to be kept locked.)

• For employees who have not completed specific radiation safety training, it is strictly forbidden to work with radioactive material.

• If you notice any improper storage, use or disposal of material which is labelled as radioactive, immediately inform the radiation safety representative! Don't touch the material and keep a safe distance!

• In order to get authorisation for working with radioactive material, it is obligatory to contact the radiation protection representative in charge. He or she will inform you of the necessary steps.

Radiation Safety Representatives

Name	Building	Room	Tel.
Dr. Erhard Schafler	Strudlhofg. 4	3E40	51445
Dr. Alfred Priller	Währinger Str. 17	1/13	51703

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What to do in case of an emergency

What to do in case of fire?

- **1. Alarm**
  Activate push-button fire alarm
  Call fire brigade: 0-122

- **2. Rescue**
  Help to rescue endangered persons!
  Leave building **rapidly** via escape routes.
  Gather at assembly point.

- **3. Extinguish (optional)**
  Only try to extinguish fire without putting yourself in danger!





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Assembly point in case of fire alarm

Leave the building via following the emergency exit signs.
Then gather at the respective assembly points

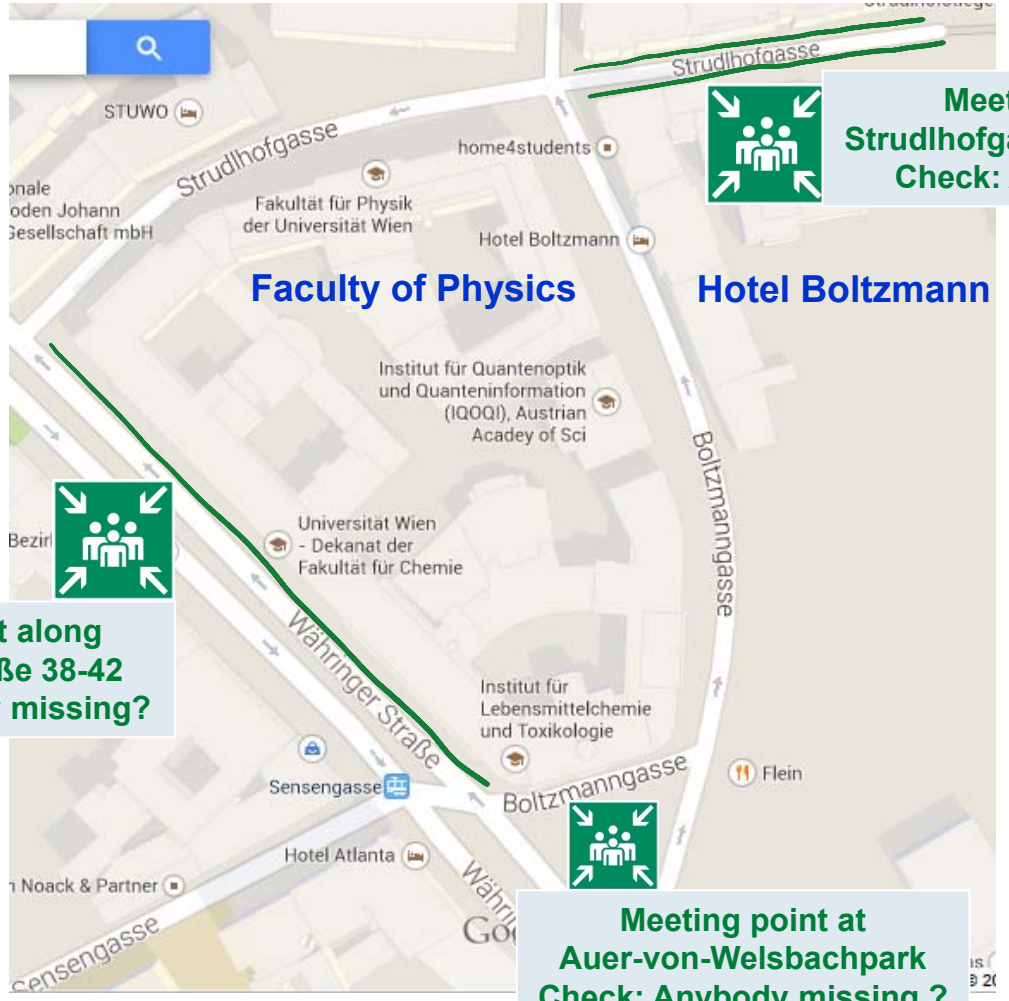
From the main building of the faculty of physics (see also next page) gather at the nearest of one those assembly points:

Strudlhofgasse,
Auer von Welsbach-Park oder
Gehsteig Währinger Straße 38-42

From Sensengasse 8 or Währingerstraße 17 gather at:

The sidewalk in front of the building
Please keep the firefighter access free!

Assembly point in case of fire alarm



Meeting point along Strudlhofgasse (marked in green) Check: Anybody missing ?

Meeting point along Währingerstraße 38-42 Check: Anybody missing?

Meeting point at Auer-von-Welsbachpark Check: Anybody missing ?

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In case of an alarm: Keep calm!

- Leave the building promptly! Use fastest and safest way out of the building!
- Don‘t use the elevators! (If you are in the elevator while the alarm starts, the elevator will go to the ground floor and open the doors.)
- Follow the escape routes!

- Gather at assembly point and wait for further instructions.

- Help people who are unfamiliar with the location or have mobility problems or injuries without putting yourself in danger. Take only personal belongings that are in immediate reach. Don‘t lose time. Reentering the building after evacuation is forbidden.

For more information:

https://intra.univie.ac.at/fileadmin/user_upload/rrm/Download/Brandschutzordnung.pdf

Fire Safety Precautions 1

Check the location of the next fire extinguisher

in case of fire every second is important!!!

- Make yourself familiar with the fire safety rules (escape routes, assembly points)!
- Keep fire extinguishers and fire alarm boxes clear at all times.
- Keep escape routes clear.
- Escape routes are **not a storage area** – they are not to be cluttered with any objects.
- In areas with fire hazards: **Do not work with open flames!**

It is stricly forbidden to block a firedoor, or to fasten it by wedges

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Fire Safety Precautions 2

- Remove posters and papers from your doors.
  They are your fire escape doors!

- Fire extinguishers must be fixed to the walls
  are not to be removed **except for their use in case of fire**

- We have a **fire alarm system**
  - Fire alarm can be set to heat or smoke
  - **Don‘t smoke!** False fire alarms will be set on your private bill (>1000 €)

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(German) Classification and Use of Fire Extinguishers

Combustibles A: Common combustibles such as **wood, paper, charcoal, some plastics and textiles** → Extinguisher: **water, foam, dry chemicals**

Liquids B / F: B: Flammable liquids or liquefying materials such as **petrol, diluents, paint, resin, wax, oil, fat, etc.** → Extinguisher: **CO_2 (B), foam (B), dry chemicals (B)**. **Fat fire extinguisher (F)**: fires involving cooking media (fats, grease and oils)

Gases C: Gases, including low pressure gas, e.g. ***methane, propane, butane, acetylene*** → **dry chemicals**

Metals D: Combustible metals such as aluminium dust → **dry chemicals**

	A	B	C	D
water	X	-	-	-
foam	X	X	-	-
CO 2	-	X	-	-
dry chemicals	X	X	X	X

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Contact in case of emergency:

European Emergency Number: 0-112

Fire brigade: 0-122

Police: 0-133

Ambulance: 0-144

Emergency doctor on call: 0-141

Poison control centre of the AKH: 0-406 43 43

Health and Safety Manager

(Herbert Dagott, MSc): 0664 60277 12845

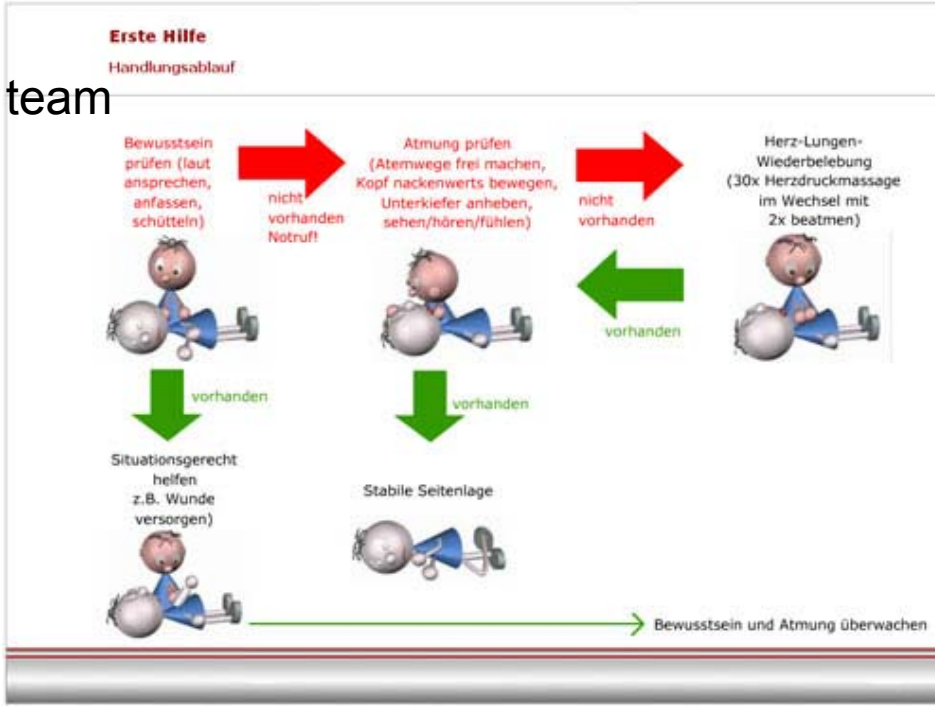
Security team of the University of Vienna (24h duty): 12700

Accidents and Injuries

Stay calm!

RAISE THE ALARM
(rescue teams: fire brigade 122, police 133, ambulance 144)

- ✓ WHERE is the accident
- ✓ WHERE are you waiting for the rescue team
- ✓ WHAT happened
- ✓ WHAT kind of injuries
- ✓ HOW MANY injured people
- ✓ WHO is calling



EVACUATE AND HELP

- ✓ Provide first aid
- ✓ Call a first aider if necessary

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- This sign identifies a first aid kit

  Know the location of first aid kits in your working environment – inform your group leader if not available.

- We have a defibrillator on the ground floor

  Do not be scared to use: Fully automated guidance through the process!

- List of First-Aiders (ErsthelferInnen)

  Listed on each floor.

- Room for first aid on the ground floor 3E65. All First-Aiders have a key.

Safe use of our students' machine shop

Sichere Benutzung der Studierendenwerkstatt im 4. Stock

Verantwortlicher für den Schlüssel: Stefan Loyer (72605)

Um einen Schlüssel für die Werkstätte zu bekommen:

1) Pass the special course "260081 UE "
2) Sign the "Workshop regulations of the Student workshop"
   and you will get the filled Key-Form (in the Quantum-group office, 2nd floor)
3) Take your documents to Stefan Loyer who checks them and signs your Key form
4) Hand-in all signed forms in the dean's office (Mrs. Hofböck) and you will receive the button for the Student Workshop

Verbot der Alleinarbeit (d.h. keine eine andere Person in Sicht- bzw. Rufweite) wenn Tätigkeiten mit erhöhter Unfallgefahr ausgeführt werden, die eine sehr kurze Rettungszeit – zwischen 0 und 5 Minuten – bedingen können.

Safety in the students' machine shop

- **Before work:**
  - Transparent safety goggles (obligatory)
  - Gloves (if needed)
  - Hair net if your hair might become entangled with the lathe or drill

- **At work:**
  - Don't leave the spanner on the turn table when you start the machine (risk of death)
  - A second person must be in range of sight and hearing

- **After work:**
  - Clean the work bench!
  - Notify Stefan Loyer (72605) of missing or broken items.

An ergonomic PC workstation

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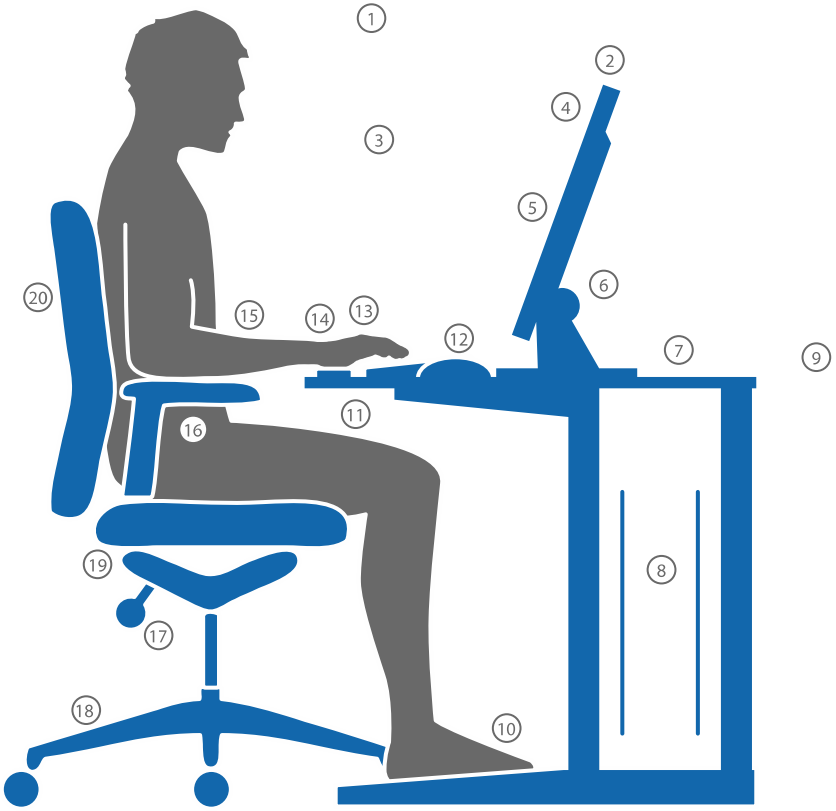
Positioning of Your Workstation

- ✓ To avoid glare from windows, position your computer workstation so when facing the monitor you are sitting beside or parallel to the window. High light levels from outside (e.g. when facing a window) may generate reflections and will make it difficult to focus on the screen.
- ✓ Don‘t clutter your leg space (e.g. with the computer tower). You need room under your desk to vary your leg posture throughout the day and to avoid awkward seating positions.
- ✓ Don‘t clutter the space on your table, so that you can position your monitor, keyboard and mouse freely as needed according to your work tasks.
- ✓ Between table and other furniture a distance of 1 m should be kept; at least a minimum passage width of 0.6 m is required.
- ✓ In your office, avoid storage of items you rarely need.

An Ergonomic Workstation (Overview)

① glare-free lighting
② monitor 90 degrees from window
③ distance to monitor ≥ 60cm
④ top of screen and eye level
⑤ glare-free monitor
⑥ monitor tilted 10° -25°
⑦ table area ≥ 160 x 80 cm
⑧ adjustable table height 68-82 cm
⑨ surrounding noise max 55 dB (printer)
⑩ footrest if required



11 thighs horizontal
12 ergonomic mouse
13 palm rest max. 3 cm
14 space for hand rest ≥10cm
15 elbows 90° angle
16 adjustable arm rests
17 dynamic seating function adjustable to body weight
18 5-point base to avoid tip-over
19 adjustable seat height
20 back support

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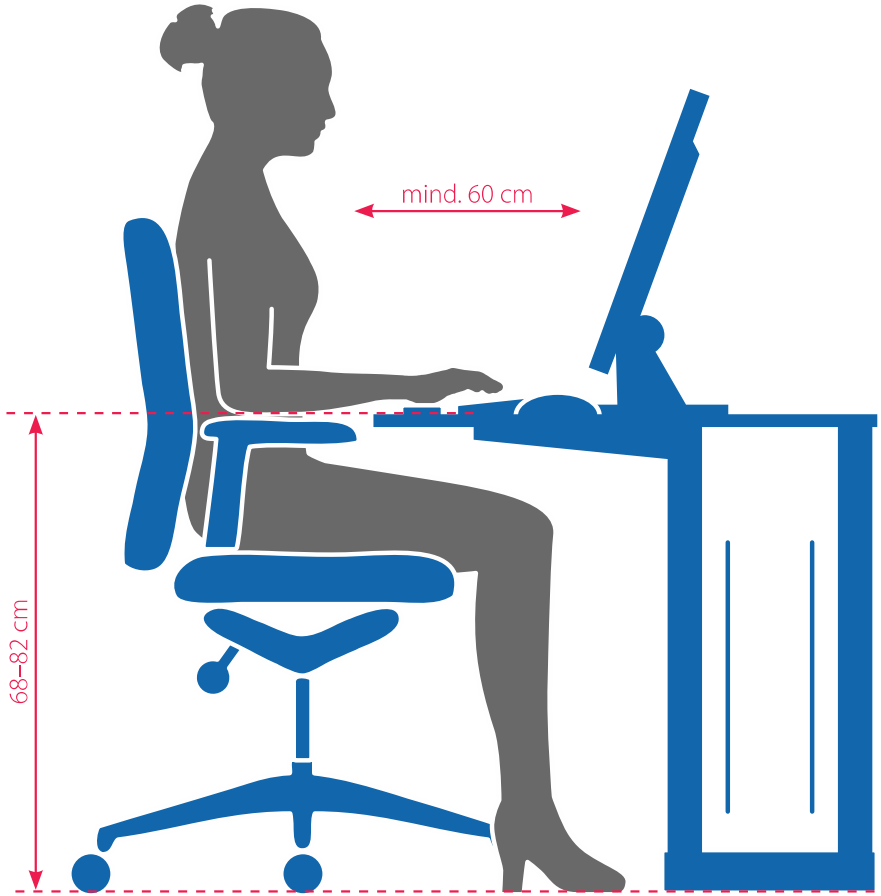
Adjust Chair and Table According to Your Needs

- ✓ Place your feet flat on the floor
- ✓ Right angle between thigh and calf
- ✓ Right angle between upper arm and forearm
- ✓ Sit straight, don‘t slouch
- ✓ Relax your shoulders

Adjust Chair and Table According to Your Needs



- ✓ In case you can‘t reach the floor when sitting, then your seating position is too high. You should lower the chair and the table. If the latter is not possible, you need a footrest.
- ✓ **Dynamic seating position – general rule:** There is no correct seating position, but the continuous **change from one position to the other** is beneficial for your intervertebral discs and your circulation

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Height and Distance to Monitor

- ✓ The monitor should be tilted backwards
- ✓ Adjust the height of the monitor so that the top line of text on your computer screen is at or slightly below eye level
- ✓ The distance between your eyes and the screen when sitting in a typing position should be about arm‘s length
- ✓ When sitting in a typing position, your neck should be slightly flexed downwards (10° -15°)

Height and Distance to Monitor

- ✖ Continuously looking horizontally or upwards will strain your neck and your eyes.
- ✖ A screen that is too high can lead to dry, irritated eyes because it forces you to constantly keep your eyes wide open and blink less frequently. A screen that is too high can also cause neck pain.
- ✓ Regularly take breaks every 50 minutes of continuous computer work:
  10 minutes break or change of work!!!
- ✓ Frequent short breaks are more effective than few longer breaks. Over the day, several 10 minute-breaks should be kept.

DSE/VDU Glasses

- ✓ Employees who use computers (display screen equipment) regularly and for a significant amount of time over a working day, are eligible for DSE/VDU glasses (when problems have been identified during a DSE/VDU test).

- ✓ DSE/VDU glasses are designed for the distance to the monitor as well as to your paper documents (e.g. bifocal lenses). The distance will be more than the usual reading distance of 30 cm.

- ✓ Further information about DSE/VDU eye checks and glasses can be found at uni:intra/Themen A-Z, Bildschirmarbeitsbrille

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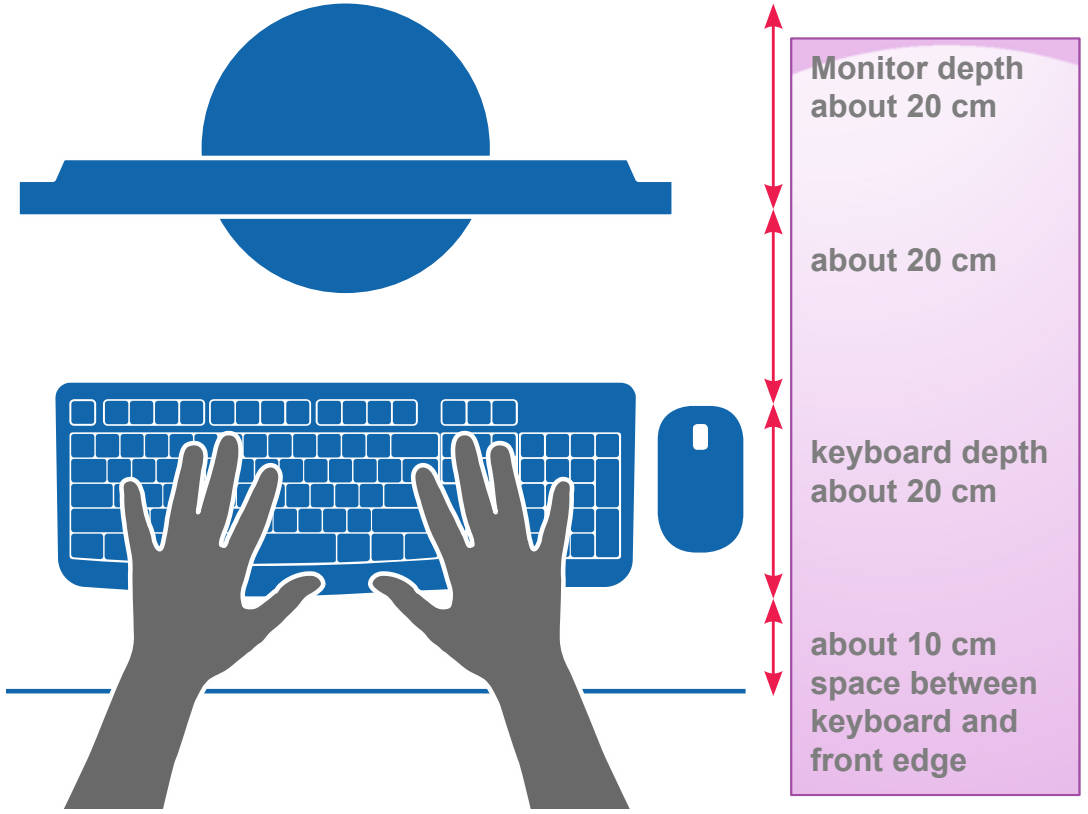
Required Space

- ✓ Between the front edge of the table and the keyboard should be a minimum space of 10 cm for hand rest
- ✓ Between keyboard and monitor should be space for paper documents
- ✓ The monitor must not protrude over the rear edge of the table



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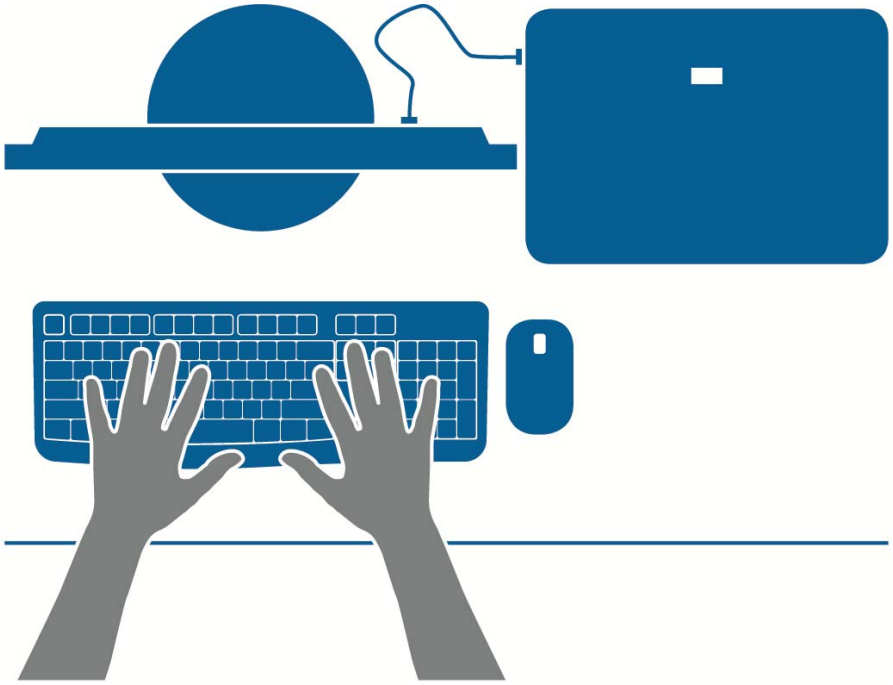
Working with the Notebook

- ✓ Connect your laptop to a docking station or use an external keyboard and an external monitor. This allows you to arrange your equipment freely according to your needs.



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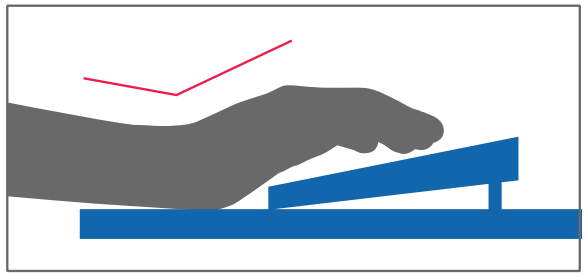
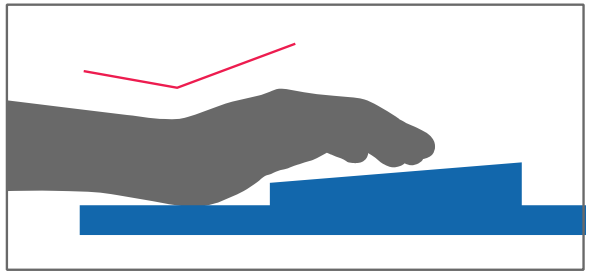
The Keyboard

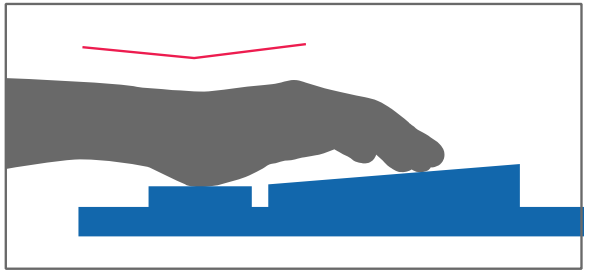
- ✓ The keyboard has to be separated from the monitor and can be tilted.
- ✓ Keep the small legs, found on the underside of most keyboards, folded in to keep the keyboard flat and prevent bending of your wrists. Optimal strain relief can be achieved by using a palm support.



Strain on wrists



Strain on wrists relieved



Optimal strain relief by using a palm support

Legal Notes

- According to ArbeitnehmerInnenschutzgesetz ASchG § 15 all staff must fulfill regulations that are necessary for safety of life, health and morals.

- In case health and safety rules are ignored: action must be taken, such as

a) Personal instruction by the direct supervisor and notification to the next management level

b) Official written warning notice which will be forwarded to the relevant departments (e.g. human resources, workers' council,...) and personal instruction by the direct supervisor will be repeated.

c) If, after a) and b), health and safety rules continue to be broken or ignored, this may eventually lead to temporary dismissal or even termination of work contract.

Congratulations, you‘re almost done …

Please proceed now to the online test.

For any hints, ideas, recommendations etc.
please use the feedback zone in moodle

This safety tutorial and the quiz were by:

Nikolai Kiesel, Wilhelm Markowitsch, Viktor Schlosser,
Philipp Haslinger, Stefanie Barz, Florian Blaser, Petra Beckmannova

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Members of the research area „Quantum Optics, Quantum Nanophysics and Quantum Information“,
please send feedback and questions to miriam.lotz-scheibenpflug@univie.ac.at

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