Chair for Experimental and Astroparticle physics
Safety Manual

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Emergency numbers

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Fire department **Accident** **Emergency medical services** **Emergency technical situation**	**112** **Mobile: 089-289/14100**

Accidents with Radiation Hazard
(Contamination, Incorporation)

during working hours

Radiation representative (StrlSchV)	Ms. Morawitz	12682
Substitute	Ms. Fröhlich	12687
Radiation prevention contact	Ms. Ermer	12713
Radiation prevention technician	Mr. Taubitz	12687
Radiation representative (Cyklotron)	Dr. Mentler	12689
HR 6 Radiation prevention	Mr. Sabath	14680
HR 6 Chief and Radiation prevention commissioner	Mr. Daake	14688

Off-time working hours Fire Department 112

Technical Control Room		14200
Fire Department (control center)		12024
Works doctor (BAD)		01-32991410
Safety Engineer Garching	Mr. Drees	12283
Security representative	Ms. Fröhlich	12687
(Substitute	Ms. Morawitz	12682)

Safety Guidelines for Employees and Visitors

1. **Before working in laboratories or with experiments make sure that you:**
   - ***Certify by signature that you have noted and understood the general safety rules:***
     - by participation of oral instructions
     - in exceptional cases (short-time visitors) by reading the written summary in the safety manual
   - ***Obtain a briefing by the person in charge of your laboratory***
2. **Read the instructions "How to react in case of emergency" carefully (available on the Homepage E15/Safety):**
3. **Familiarize yourself with the general safety facilities:**
   - Location of the next telephone
   - Building Escape Routes (Plan of the Escape and Rescue Routes)
   - Location of the first-aid kits. Remember that minor injuries must be recorded in a book.
   - Location of fire alarm and fire extinguishers, including fire extinction blankets
   - Location of the eye douches and general showers
4. **Observe any special safety instructions for individual laboratories/experiments.**
5. **Observe the following rules for storage of hazardous materials:**
   - Do not keep amounts in excess of daily consumption in the laboratory
   - Use the cabinets designated for chemicals
   - Compressed gas cylinders must be kept in designated storage area (i.e. you should keep only adequately secured and reasonably required amounts in the lab environment)
6. **Always wear suitable protective clothing**
   - Goggles, protective gloves, overalls, shoes, ear and breathing protection, etc.
7. **Always keep escape routes free and clear.**
8. **Pay attention to the rules for handling of waste.**
9. **Inform security agent of all safety-relevant events and irregularities.**
10. **Your personal safety has priority. After that, take care of the safety of others.**

Protection against Electricity Risks

Since electricity is needed for almost all technical and industrial activities, it is absolutely necessary to take adequate precautions.

That's why we have laid down the following

General Safety Rules

1. When using electric appliances or devices, check first that they are in perfect condition.

2. Use only the designated electronic switches and control equipment. Do not alter the settings of any safety arrangements.

3. Never use electric appliances or devices when they – or when your hands or feet – are wet (except as advised by specially trained employees).

4. In case of a malfunction or power failures immediately switch off and unplug the device. If necessary, inform a specially trained employee. Do not take any risks!

5. Specially trained employees must be immediately notified of all defects and irregularities concerning electric devices or appliances. Do not use defective devices or appliances! Don't forget to inform others about the danger and keep them from using defective devices!

Special Safety Rules

6. Do not try to repair or „correct" electric appliances or devices in any way, if you do not have detailed knowledge of the potential risks and the necessary procedures/mode of operation.

7. When using electric tools or other portable electric devices, familiarize yourself with any special safety rules (e. g. concerning the expiration date of the BGV A3 certification) Strict compliance with such precautions is essential, particularly if you use electric tools or devices in extreme environmental conditions such as very high or low temperatures, humidity, potential of chemical spills or risk of fire or explosion.

8. Do not open protective covers and inlets of electric appliances, switch boxes or aggregates. Pay attention to danger signs and barriers that are supposed to prevent contact with energized electric lines, wires, circuits or other parts.

9. Specially trained employees are responsible for all work carried out in close vicinity to electric appliances or facilities and will give appropriate instructions.

30.05.2011

What to do in case of electrical accidents:

1. **Whatever you do, always put your own safety first**
2. **Turn off current**
3. **Bring injured persons out of danger immediately and extinguish the fire, if necessary**
4. **Call a doctor**
5. **Identify any injuries sustained**
   - **5.1 If breathing and circulation are OK, place the injured person in recovery position (*stable recovery position*) and arrange for a medical check**
   - **5.2 If breathing or circulation has stopped, initiate mouth-to-mouth breathing/resuscitation or, as the case may be, a heart massage and arrange for the patient to be taken to hospital (he or she must be kept in a lying position!)**
   - **5.3 In case of shock: place the injured person in the shock position and arrange for him/her to be taken to hospital**

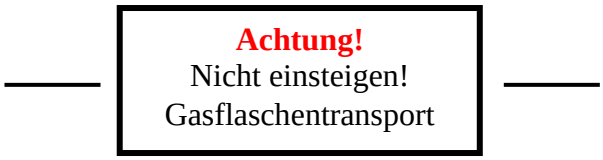
Transport of Gas Cylinders in Elevators

Health and Environmental Risks

- When people use an elevator in which gas cylinders are transported there is always the danger that gases may escape due to defective valves or negligence.
- In such a case, the confined space within the elevator would offer no escape so that any release of corrosive, poisonous or suffocating gases might have harmful or even lethal consequences.

Protective Measures and Precautions

- In elevators, gas cylinders, liquid nitrogen, poisonous, corrosive and otherwise hazardous materials should always be transported separately from people.
- Elevators carrying hazardous materials must under no circumstances be entered! Always use the following warning sign outside, which is available in every elevator:



- Gas cylinders and hazardous materials should only be transported during working hours so that an elevator can be repaired immediately in case of a malfunction.
- Elevators must never be used in case of fire!

Transport of Cold Liquid Gases (Nitrogen, Noble Gases, Oxygen) in Containers

- Cold liquid gases may be transported or stored in isolated double-walled containers, which can be either closed containing a safety valve or open. Containers with a 0.2 bar overpressure safety valve are considered open.
- Open containers must be closed with a plug during transport. These plugs must be sufficiently open to release gases, but still prohibit the spilling of liquids.
- Remember to use fire-proof plugs when transporting liquid oxygen!
- It is also possible to use glass containers with an evacuated double wall. The containers must be placed in wire baskets or metal containers.
- Remember that evaporated liquid nitrogen or noble gases – if enriched in the air – may lead to suffocation! Oxygen-enriched gas can be ignited and may result in fire.
- When handling containers with cold liquid gases, take care to avoid any contact with your skin. Always wear gloves and well-fitted safety glasses in order to avoid freezing injuries.
- In case of injuries the affected skin has to be treated immediately with large amounts of water. If the skin is heavily injured (e.g. skin detachments), medical attention must be given immediately.

Storage and Transport of Compressed Gas Cylinders

Protective Measures and Precautions

- Use only cylinders that show a valid safety check! Cylinders with expired badges must be appropriately **labelled** and returned to the supplier.
- Make sure that all cylinders are correctly labelled with the so-called banana labels showing the R- and S-phrases!
- Compressed gas cylinders must never be exposed to heat and should always be stored upright so that they cannot topple over.
- Make sure that the protective caps are fitted tightly whenever cylinders are transported or stored!
- Compressed gas cylinders must only be transported in special wagons designated for that purpose with the safety chains fastened and the protective caps screwed tightly in place.
- For the transport of cylinders that contain highly poisonous gases, make sure that breathing protection and suitable filters are always within reach!
- Combustible gases, which are kept in red cylinders, and oxidizing or fire-promoting gases (such as oxygen) must be stored at least 2 metres apart. If possible, store them at opposite ends of the storage facility with non-combustible gases in between.
- Remember to close all valves whenever you stop or interrupt your work!
- Keep oxygen instruments/fittings free from oil and grease!

How to React in Case of Danger

- First rule: Never put yourself at risk!
- Bring all injured persons out of the danger zone, then inform other persons!
- In case of fire, remove all compressed gas cylinders immediately, if possible. If not, cool the cylinders with water. Immediately notify the fire fighters with respect to the compressed gas cylinders!
- Where to find a fire extinguisher:.....
- Where to find a breathing protection mask:.....

First Aid

- **Eye injuries:** Rinse the injured eye thoroughly for some minutes with cold water, then consult an ophthalmologist.
- **Skin injuries:** Wash injured skin thoroughly with water and remove contaminated clothing.
- **Inhalation of hazardous gases:** Make sure that breathing is unobstructed and that the injured person is getting enough fresh air, then phone in-house first aid.

Instruction for handling of liquid Nitrogen (LN_2) and Helium (LHe)

Area of application: Laboratories at Physics-Department TUM
erected 1.12.1999 by safety department Z62**.**

(Info: LN2 and LHe are not hazardous materials according to GefStoffV, this guideline is not defeated by the demands to §20 GefStoffV)

E15

Possible dangers

Cryogenic liquefied Gases, skin contact can cause freez burn or frostbite.
High concentration in the air can cause suffocation.
Danger of explosion by use of thick apparatuses.

Protective measures and behaviuos rules

Protect eyes, face and skin against liquid splashes.
Ensure sufficient airing, protect against O_2- lack.
Storage containers at a cool and well ventilated place.
Use only TÜV-inspected equipments.
Avoid oxygenation at cold and liquid surface (danger of explosion).

How to react in case of danger

Provide sufficient airing

First Aid

In case of eye or skin injuries wash with plenty of water minimum 15 minutes.
Call the Doctor **Tel. 112**
From Mobil **089 289 14100**

30.05.2011

Prof. Dr. Stefan Schönert

GHS: The new hazard pictograms

New Labels

Old Labels

explosive
(danger)

E

flammable
(danger)

F od. F+

fire promoting
(danger)

O

compressed gas
(warning)

toxic
(danger)

T od. T+

corrosive
(danger)

C

GHS: The new hazard pictograms

harmful
(danger)

Xn

hazardous to health
(warning)

Xi

harmful to the environment
(warning)

N

Evacuation alarm

Keep calm

- Leave the building immediately following the escape route.
- Ask also your colleagues to do the same.
- Do not use an elevator.
- Call a fire brigade 112, if your experimental equipment without other care could become a danger.

Please wait at assembly points after leaving building

Persons in charge of E15 Laboratories

Building	RoomNr.	Name of the lab	Responsible person	Deputy
Physik 1	3501	Big demixing cryostat	Dr. Jean-Côme Lanfranchi	Sabine Roth
	3511	Alu-high vacuum coating plant lab	Dr. Jean-Côme Lanfranchi	Achim Gütlein
	3519	LarSpectrometer	Prof. Dr. Lothar Oberauer	Martin Hofmann
	3518	Elektrolab	Dipl.-Ing.Hermann Hagn	Nobert Gärtner
	3510	Computerroom	Matteo Agostini/Michael Willers	
	3504	Cleanroom/Chemistry	Dr. Jean-Côme Lanfranchi	Dr. Hong Hanh Trinh Thi
	3502	Lab/Chemistry	Dr. Hong Hanh Trinh Thi	
Physik 2	217	former Kellner´s lab	Prof. Dr. Stefan Schönert	
	219	High vacuum coating plant lab	Dr. Jean-Côme Lanfranchi	M. Willers/ A. Gütlein/ S. Roth
	221	Neutrino lab	Prof. Dr. Lothar Oberauer	Dr. Hong Hanh Trinh Thi
	245	Workshop	Harald Hess	Erich Seitz
UGL 1		Detector lab	Dr. Jozsef Janicsko	Dr. Jean-Côme Lanfranchi
UGL 2			Prof. Dr. Lothar Oberauer	Prof. Dr. Stefan Schönert
MLL		Scattering experiment	Dr. Jean-Côme Lanfranchi	Raimund Strauß

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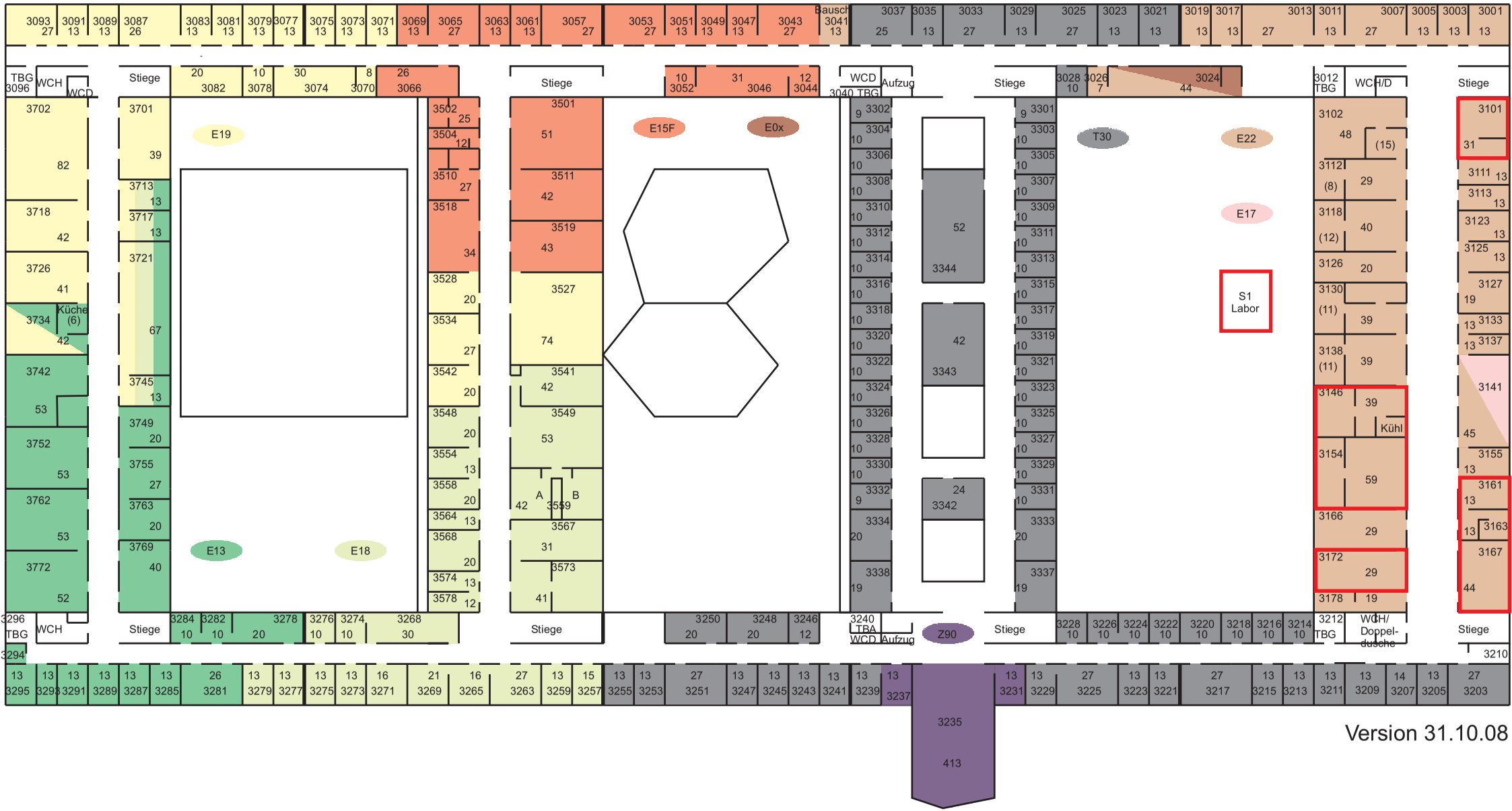

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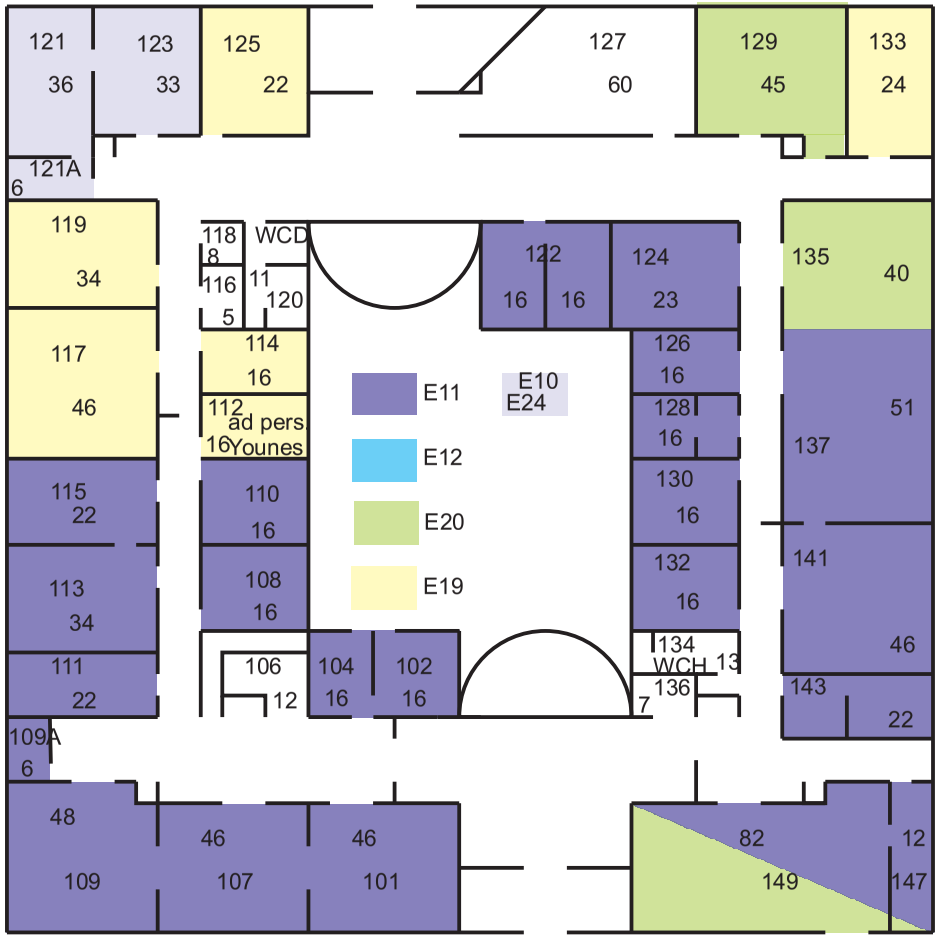
GEBÄUDE 5107 - PHYSIK II - UNTERGESCHOSS



Signature List for New Employees/ Visitors

Name	Institution	General Safety	Special Safety	Date	Signature

Example

Safety Regular Briefing of Employee XY…

(just for understanding, it must be signed in German form)

Datum der Unterweisung: 2. April 2011

Uhrzeit der Unterweisung: 10:00 Uhr

Thema der Unterweisung:

Einführung der Sicherheitsleitfäden (Checkliste aller Sicherheitsmaßnahmen im Zuständigkeitsbereich):

- Sicherheitsleitfaden für neue Mitarbeiter und Gäste

Vorstellung des Sicherheitsbuches in dem Bereich
Die Anwesenden bestätigen hiermit an der Unterweisung teilgenommen zu haben.

Anwesende: **Unterschrift:**

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Vor- und Zunahme

Unterweisung durchgeführt:
