

DESY Ukraine Winter School 2023

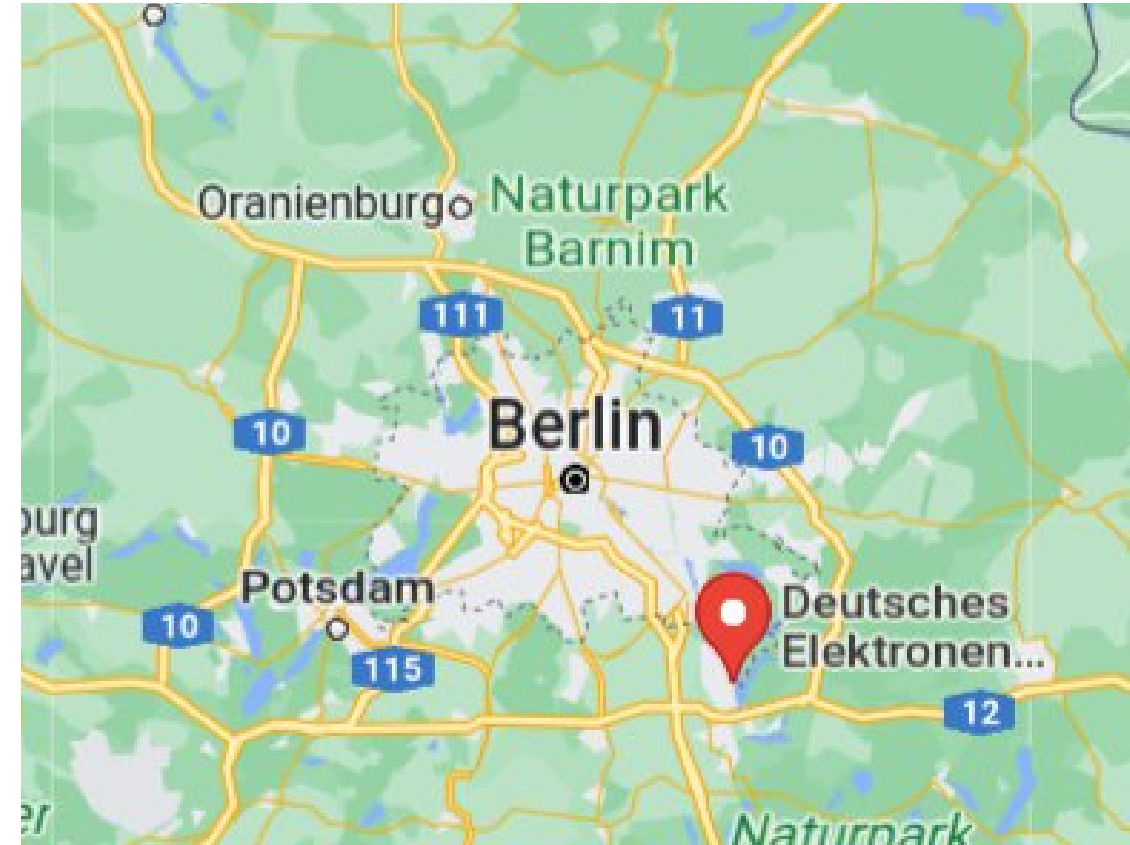


Olaf Behnke, Stefan Ohm, Frank Lehner, Martin Sandhop

We greet you, the DESY Ukraine Winter students 2023:

17 (on-site) + 2 (remote) at DESY Hamburg

5 (on-site) + 2 (remote) at DESY Zeuthen



NICE TO MEET YOU!

DESY Laboratory

DESY is a leading laboratory in Germany for

- Particle Accelerators
- Photon Science (Hamburg only)
- Particle Physics and Astroparticle Physics (mainly Zeuthen)

Hamburg



Zeuthen



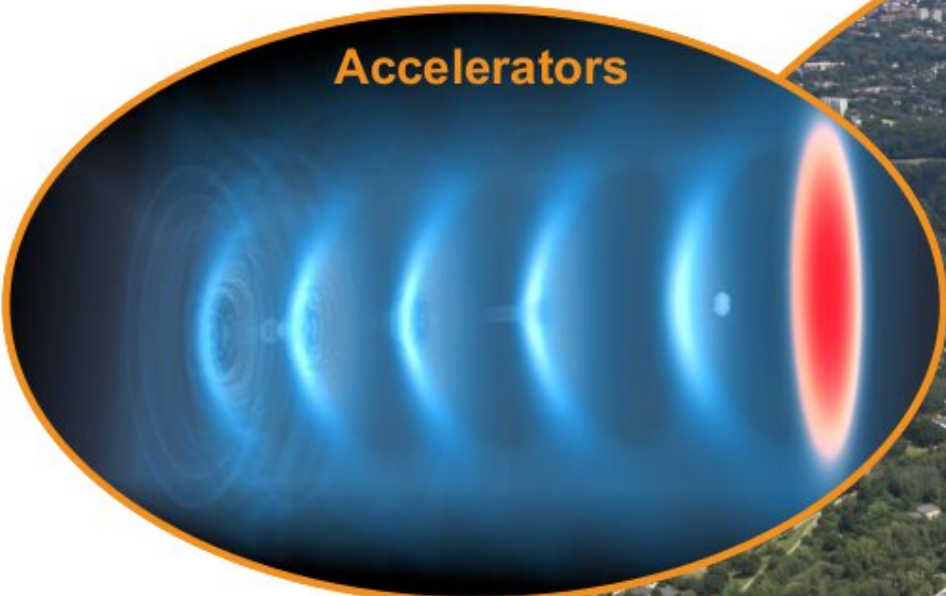
~2700 Employees, ~230 MEuro annual budget (numbers from 2015)

DESY Activities

From four research areas

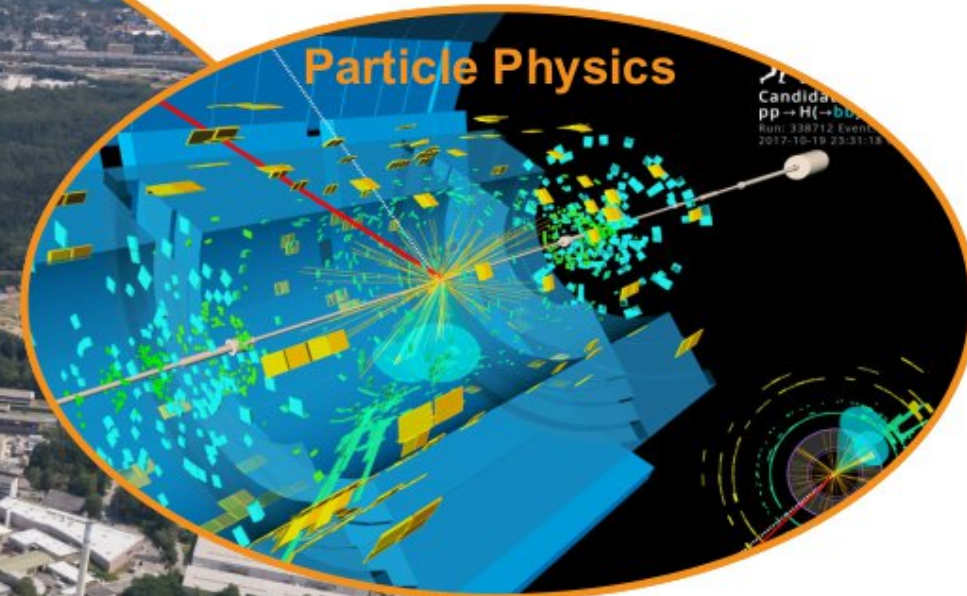
More DESY intro in next week's 6th feb. talk by T. Schoerner

Accelerators



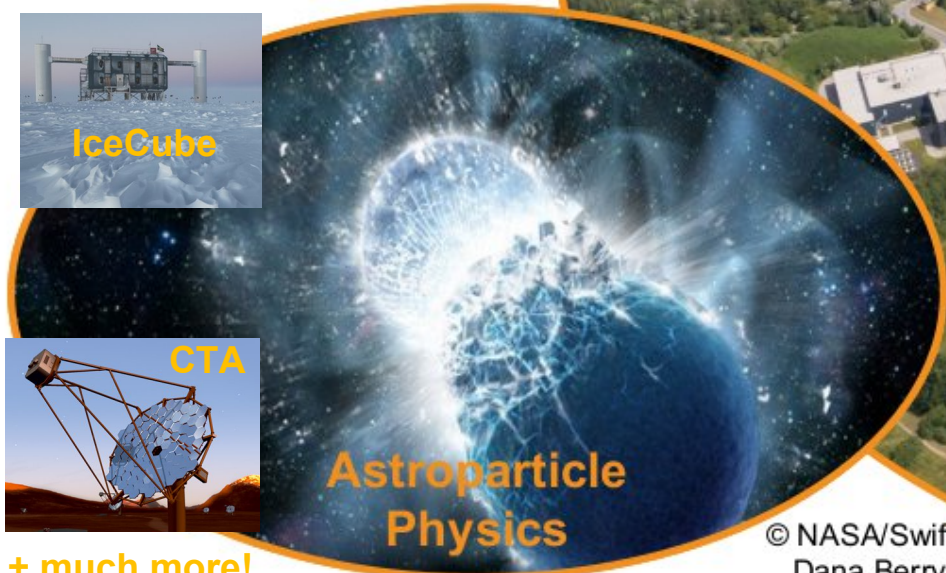
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Particle Physics



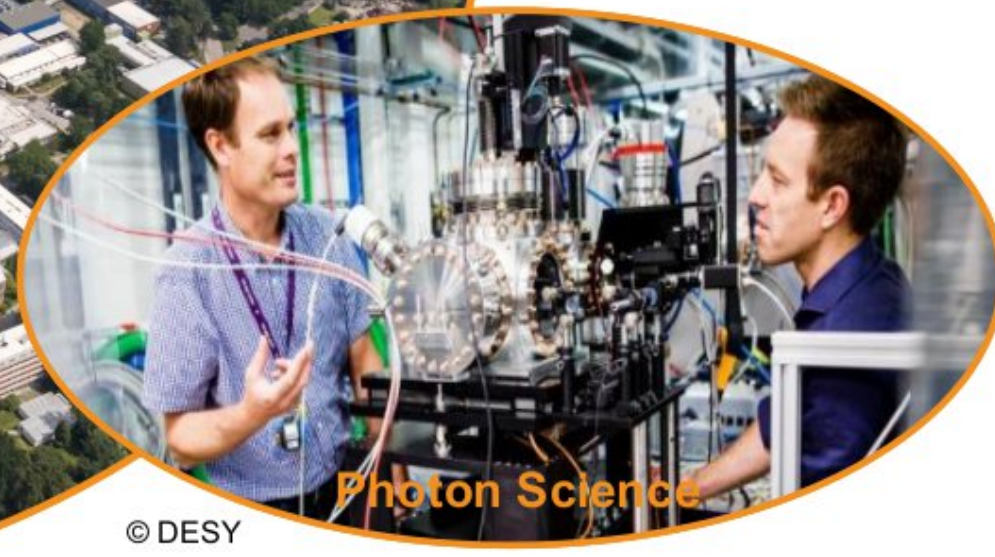
© ATLAS/CERN

Astroparticle Physics



© NASA/Swift/
Dana Berry

Photon Science



© DESY

+ much more!

Organisers

- ❖ **Olaf Behnke** (Hamburg, general olaf.behnke@desy.de)
- ❖ **Stefan Ohm** (Zeuthen, general stefan.ohm@desy.de)
- ❖ **Frank Lehner, Martin Sandhop** (Hamburg, general Administration, frank.lehner@desy.de, martin.sandhop@desy.de)

For all communications with us, please write to ukraine-school-org@desy.de

Fast communication telegram group chat: <https://t.me/+3XI7EUh-4JQ2YmFi>



Supporting persons:

Zeuthen: Gernot Maier (preparation of School) Sarah Seibt & Pavlo Plotko (general)

Hamburg: Friederike Januschek (Lectures), Klaus Floettmann (Accelerator Projects), Andreas Przystawik (Photon Sci. Projects & Lectures), Britta Steffen (Admin)

Marion Salmen (Hostel), Li Xiaoxiao (International office), Sabine Berger (Directorate's office)

Yvonne Imbschweiler (MEA2)

Oksana Chukova (ukrainian scientist at DESY)

Ukraine contact group: Greta Facile, Sergey Fomin, Ivan Vartaniants, Natalia Potylitsina-Kube, Andrei Hloskovsky

Outline

Work projects

Scientific Lecture programme

Common events: Tours, Social gatherings, training events, etc.

Practical information

Split here into separate talks at Hamburg and Zeuthen

Infos for students @Hamburg

Infos for students @Zeuthen

Program A: Hamburg: Photon science

- Modelling the evolution of X-ray-irradiated materials on femtosecond to nanosecond timescale
- FM characterization of FEL irradiated samples
- Sample preparation and characterization for time-resolved serial crystallography with MurA (XFEL)
- Coherent X-ray Diffraction Imaging on mesocrystals and catalytic nanoparticles
- Novel generation of photovoltaics and energy converter
- Absolute gain calibration of 1 Mpix AGIPD detector at SPB/SFX instrument using EuXFEL X-ray beam (XFEL)

Program B: Hamburg: Particle Physics

- CMS: Long-lived particles at the FCC-ee
- ATLAS: Tangerine Project: Transient Simulation Studies in a 65 nm CMOS Imaging Process
- Theory: Muon Collider Sensitivity to BSM Models with Extra Gauge Bosons and Heavy Neutral Leptons (2 students)
- FTX: Deep Learning-Based Time-of-Flight Reconstruction for Future Higgs Factories
- Exploratory study for the combined analysis of particle physics and astroparticle physics data in the context of PUNCH4NDI
- BELLE II: Data Analysis Project
- ATLAS: ITk Strips EC System Test Instrumentation
- CMS: tau reconstruction exploiting ML techniques (Remote)
- UNI HH Theory: XFitter Proton PDF fit project (Remote)

Program M: Hamburg: Accelerators

- Plasma wakefield acceleration (2 students)
- Characterization of digital cameras based on photon transfer measurements

Program C: Zeuthen

- Towards a multi-wavelength AGN catalogue for neutrino astronomy
- Ultra-High-Energy Cosmic Ray propagation in extragalactic space from a single source
- Characterisation of CMOS Cameras for the LAST Optical Telescope
- The effect of the atmospheric composition on CTA performance
- Pulsars at very-high energies: developing and testing pulsar analysis
- Multi-wavelength study of cosmic rays and turbulence (Remote)
- Variational Quantum Algorithms (Remote)

Your Research Projects at DESY

- **Program A:**

Experiments with Synchrotron Radiation (Photon Sciences)

Work project technical support:

All support is provided locally by the project supervisors and their respective DESY groups, system administrators, etc.

You will be integrated in the DESY groups like regular researchers, for work related questions ask your supervisors or group secretaries!

- Theory: Collider phenomenology (QCD, Higgs, etc.), String, Gravity
- Scientific computing: Web technologies

Your Research Projects at DESY

- **Program**

- **Experiment**

- engage
- chemi
- Some

What we expect from you:

On-site students

Remote students:

Work duration: 39 h per week
(including lecture time)

max. 39 h per week

- **Program**

- **Research**

- Experi
- Belle I
- Accel
- Theory
- Scien

Final work

Report:

~5-10 pages

~few pages

All students should have the chance to present their project work and results at least once to their DESY group (e.g. towards the end of the project)

General recommendation for project work:

→ don't be shy, be pro-active and don't hesitate to ask your supervisors questions and give feedback!

X group),

y

Scientific Lecture programme – Starts tomorrow, 1 feb, at 09h30

- By DESY researchers, providing background on the research
- Accelerators, Astroparticle and Particle physics, Photon science: Intro + one topical lecture, + Special lectures on machine learning & Quantum computing

Date	Topic	Lecturer	Place
1, 3 Feb	Accelerator Intro	P. Castro Garcia	Hamburg
2 Feb	Astroparticle Topical lecture: Gravitational waves	S. Zhu	Zeuthen
6-7 Feb	Particle Physics Intro	T. Schoerner-Sadenius	Hamburg
9-10 Feb	Astroparticle Physics intro	E. de Ona Wilhelmi	Zeuthen
13-14 Feb	Photon Science intro	S. Bari	Hamburg
15 Feb	Particle Topical lecture: Dark Matter, Axions, Alps	A. Lindner, C. Schwemmbauer, J. Rubiera	Hamburg
16 Feb	Photon Science Topical lecture: Characterization of light	S. Toleikis	Hamburg
21 Feb	Special Lecture: Intro to Quantum Computing	S. Kuehn	Zeuthen
22 Feb	Accelerators Topical lecture: Plasma Wakefield acceleration	J. Osterhoff	Hamburg
23-24 Feb	Special Lecture: Intro to Machine Learning	I. Sadeh	Zeuthen

- Most lectures start at 09h30, but some exceptions!
- ZOOM streaming to other lab and outside world
- All details including exact times and locations: see <https://indico.desy.de/event/37353/timetable/>

– No dedicated exercise sessions but plenty of time for questions & answers

Today

- 31. Jan Welcome/opening Day – more details later

Get together 1 in Hamburg

- 8. Feb 2 pm school photo shooting (Foyer of main audit. bld 5)
 - 8. Feb 2.10-4 pm DESY Tour (Start in Foyer of main audit. bld 5)
 - 8. Feb 6-8 pm Social evening with Dinner (Canteen extension)
- 20. Feb 09.30-11.30 AM Fellowships and support programs (DAAD), (Hamburg, SR2)

Get together 2 in Hamburg

- 27. Feb 2-4 pm XFEL Tour (start at Foyer of main audit. bld 5)
 - 27. Feb 6-8.15 pm Dinner (Carls restaurant in Harbour city)
 - 27. Feb 9-11 pm [Concert \(Elbphilharmonie\)](#)
 - 28. Feb 10.30 am -1.30 pm Career Training (SR1)
- Finale: 9. Mar 09.30am - 4.30pm Final sessions with work reports and closing of the school (Simultaneously in Hamburg and Zeuthen, rooms TBA)

Practical Information



Use following **WLANs**:

- Science-Hotspot - easy registration with web interface
- [Eduroam \(via home university, or registration\)](#)
- [DESY \(once you have DESY computing account\)](#)

A dedicated webpage with lots of practical info and tips is here: [Notes Webpage](#)

More practical information in the separate talks for
Hamburg and Zeuthen

Infos for students @Hamburg



~1600



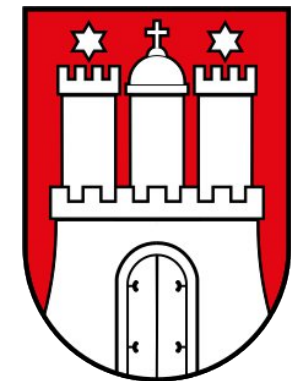
~ Today

Welcome to DESY Hamburg

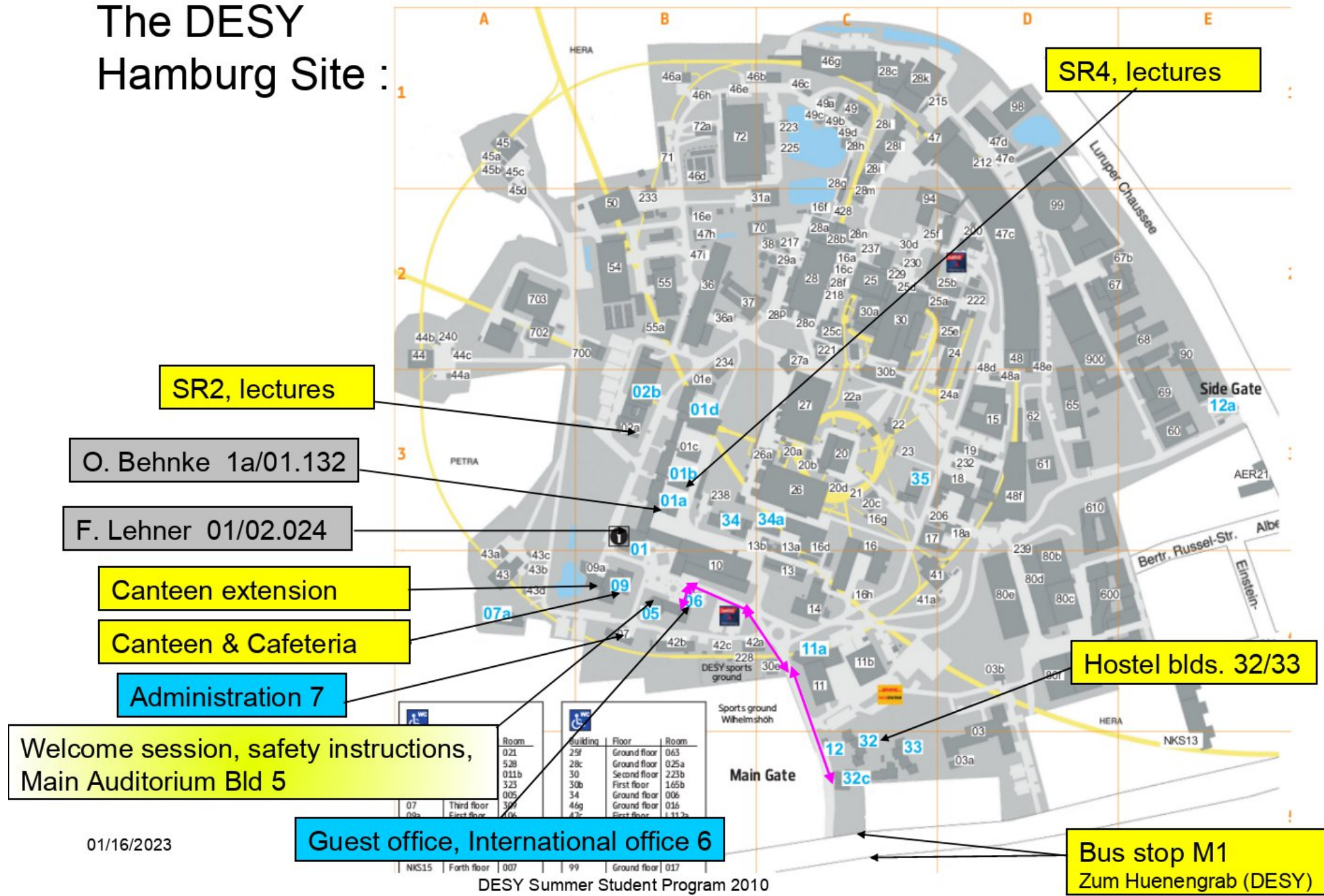
- ❖ Olaf Behnke (general, olaf.behnke@desy.de)
- ❖ Frank Lehner, Martin Sandhop (general Administration, frank.lehner@desy.de, martin.sandhop@desy.de)
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Natalia Potylitsina-Kube, Andrei Hlosovsky

Welcome



The DESY Hamburg Site :



01/16/2023

Room	Building	Floor	Room
021	25f	Ground floor	063
528	28c	Ground floor	025a
011b	30	Second floor	223b
323	30b	First floor	165b
005	34	Ground floor	006
309	46g	Ground floor	016
006	47c	First floor	117a
07	09b	Third floor	
007	99	Ground floor	017

Financial support

- Daily subsistence allowance of 25 Euro,
- + Travel reimbursement (2 x 100 Euro flat, no invoices needed)

Payment modalities handled after this talk

Life on the DESY Hamburg campus

Practical information on the DESY campus: DESY booklet

https://welcome-services.desy.de/sites2009/site_guest-services/content/e56138/DESY-Welcome-Booklet-2022.pdf

Please have a look, you can find information e.g. on

- ❖ Eat and drink at DESY
- ❖ Medical services at DESY
- ❖ Emergency services at DESY
- ❖ etc.

<https://desy.myalsterfood.de>

Opening hours

Canteen

Mon - Fri, 11.00 - 14.00

Bistro

Mon - Fri, 17.00 - 22.00

Kitchen until 21.00

Cafeteria

Mon - Fri, 7.00 - 17.00

Weekend

Sat - Sun, 8.00 - 15.00

Life in the DESY Hostel – few hints

- Missing equipment (kitchen, cleaning, etc.) or other requests/complaints: don't hesitate to email hostel.service@desy.de (or visit them in their office 06/118)
- Weekly laundry change

Covid-19 handling at DESY

Dedicated webpage: https://www.desy.de/coronavirus/index_eng.html

Guidelines: [DESYGuidelinesCorona_eng.pdf](#)

Recommendations from DESY medical officer katharina.buenz@desy.de:

„I recommend that the students receive just before the program start a number of self-test kits.“

„If you have any symptoms please stay in your hostel room and test yourself.“

„If you are unsure what to do or for any questions please consult the DESY medical officer team - in Hamburg write an email to betriebsarzt@desy.de or call the phone number 2171 (or +494089982171) or write to health.service@desy.de

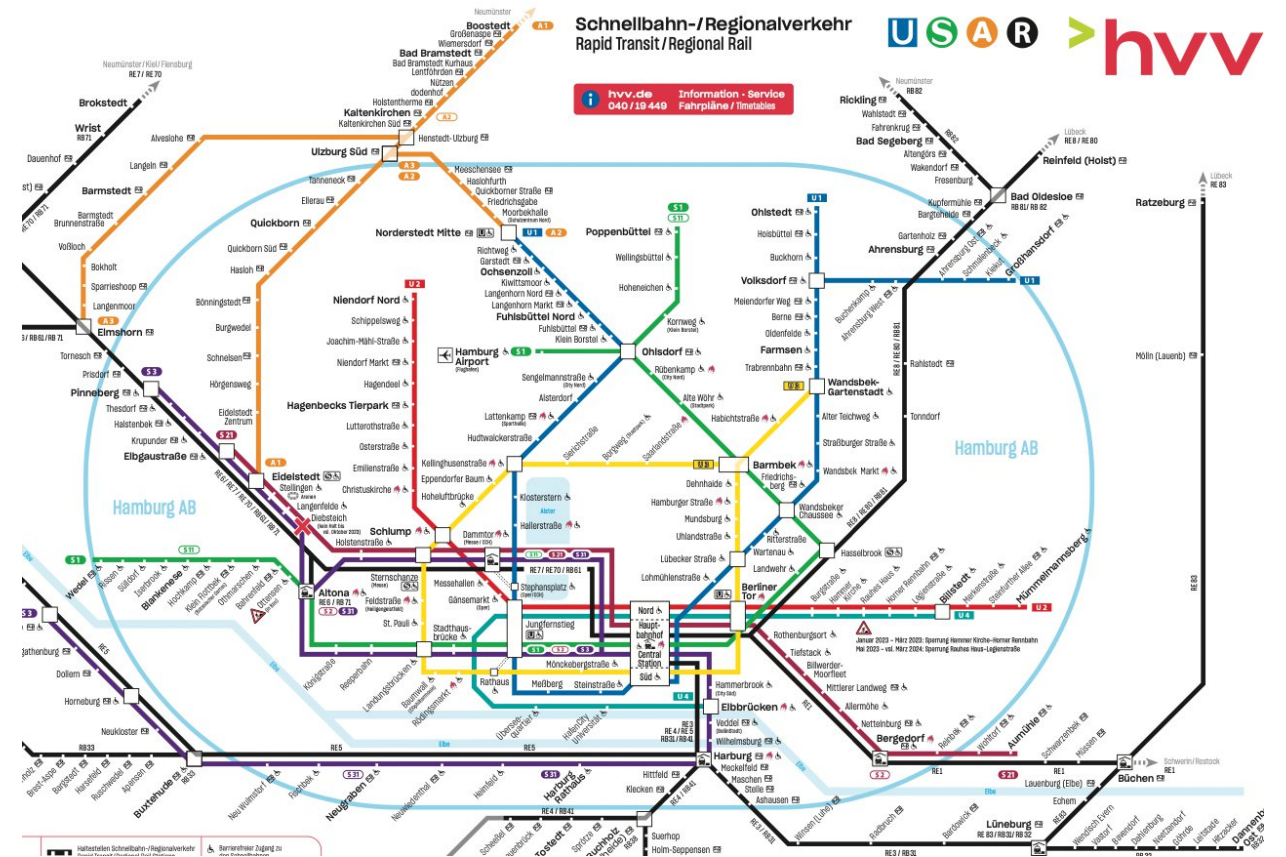
Overview of Single and Day tickets

With the single tickets you get on, change lines, get off - and back on again! Anything goes as long as it is on the most direct route to your destination. Round trips and return journeys are not permitted, however.

Buying your ticket

You can get single, day and group tickets in the [Online Shop](#), via the hvv App or with your hvv Card with a discount of 7%. Or you can simply purchase tickets at a ticket machine or on the bus.

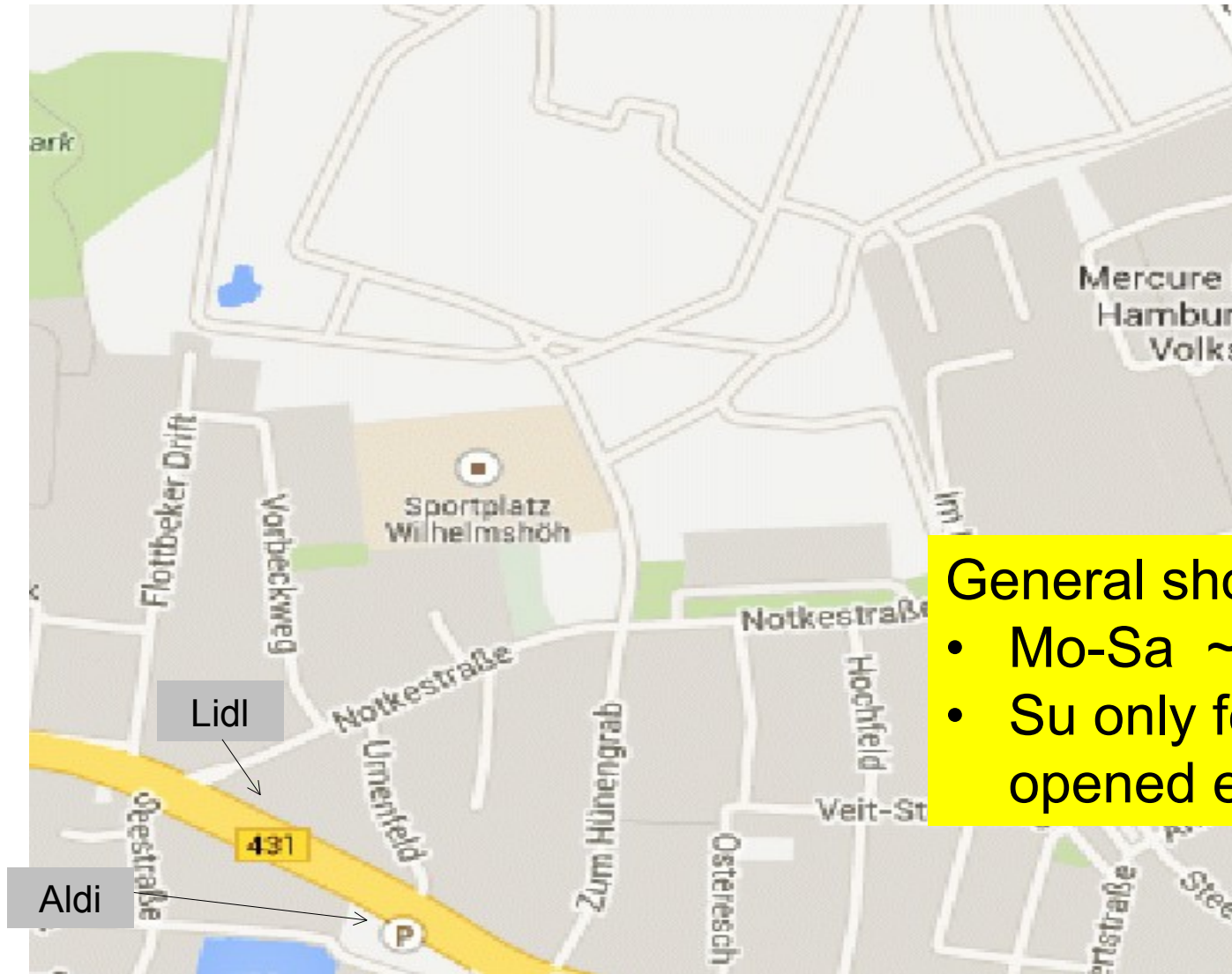
The online [timetable info](#) will show you the right ticket to get where you want. Just click on the link “Tariff Overview” in the search results screen.



Areas / Fare zones	Single Ticket	9 am Day Ticket	All Day Ticket	9 am Group Ticket
1-2 fare rings	3,60 €	7,10 €	8,40 €	13,40 €
3 fare rings	5,80 €	11,10 €	12,90 €	20,60 €
4 fare rings	7,90 €	14,10 €	16,90 €	26,80 €
5 fare rings	9,60 €	17,80 €	21,20 €	27,80 €
fare rings A-F	11,30 €	20,60 €	25,10 €	28,50 €
Hamburg AB	3,60 €	7,10 €	8,40 €	13,40 €

- Group ticket for up to 5 persons is one of the best options – valid from 09h00 until 06h00 next day
- Hamburg AB covers most of Hamburg, costs 13,40 Euro

Some (cheap!) supermarkets nearby



Discounter/Supermarket brands:

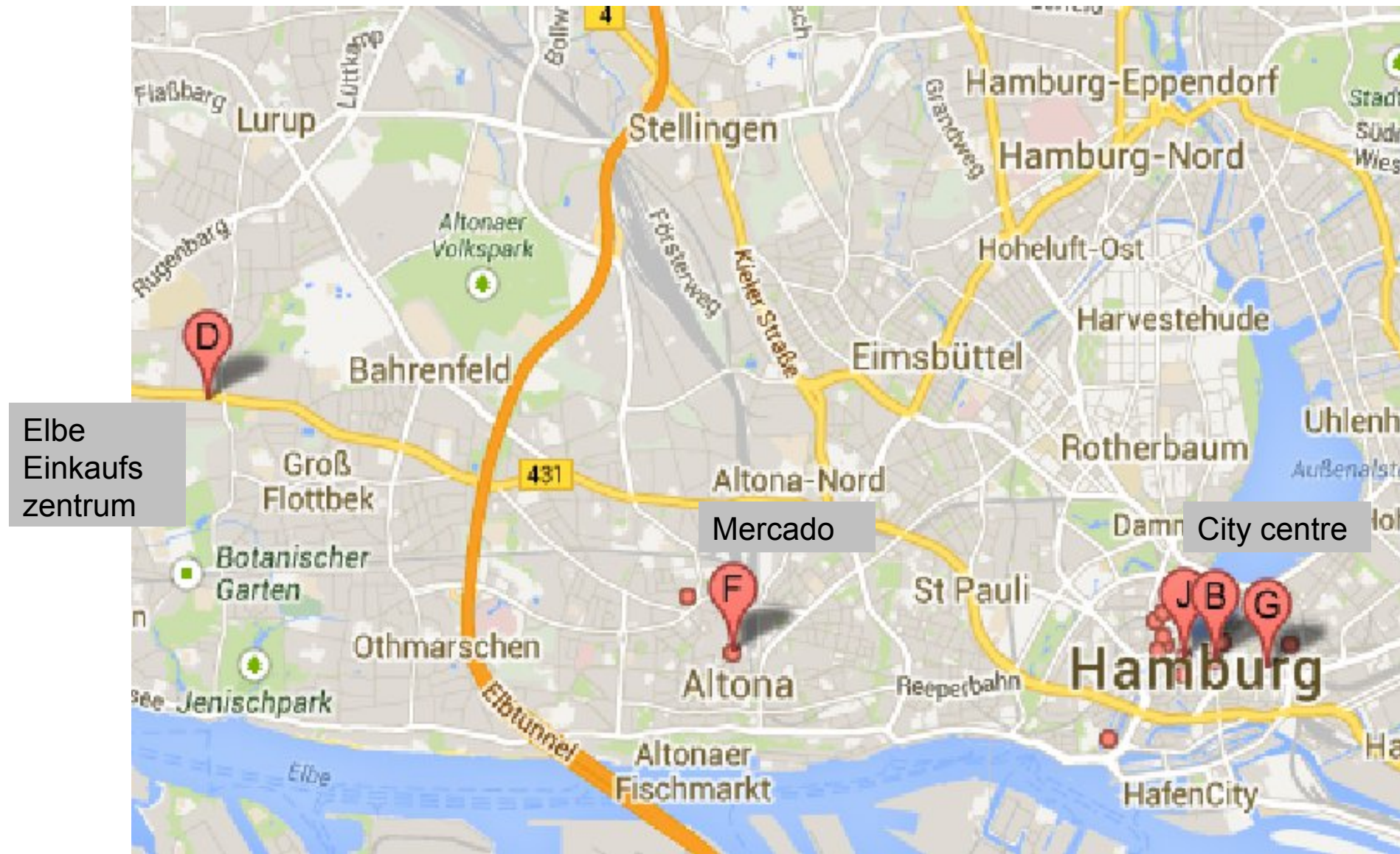
- ALDI
- LIDL
- PENNY
- NETTO
- REWE
- EDEKA

General shop opening hours:

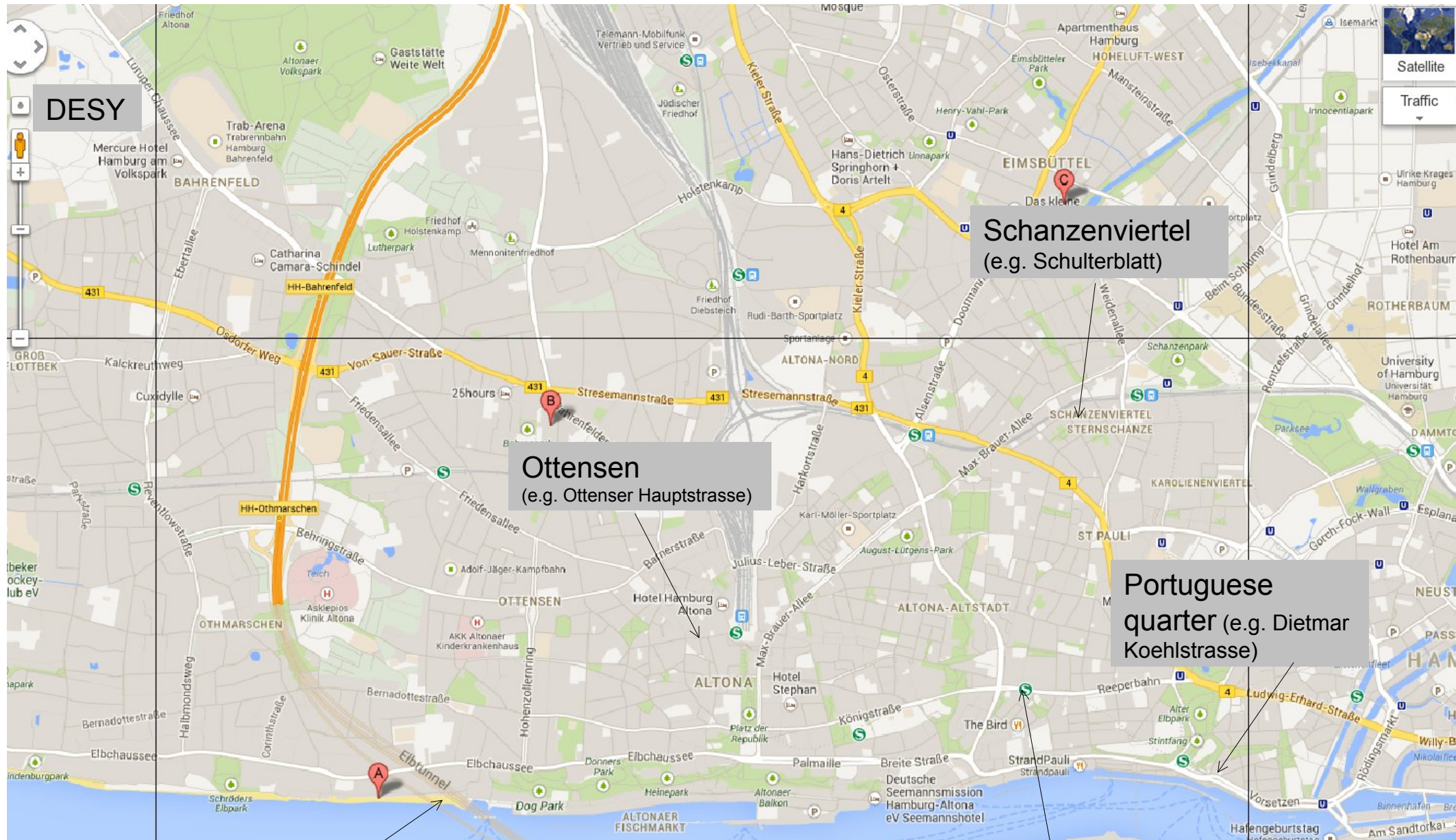
- Mo-Sa ~07-2x, x=0-3
- Su only few convenience stores opened e.g. in Altona railway st.

Weekly market: we + sa 08-13: fresh products (more expensive)

Shopping centers (selection)



Cool places, Dinner, Nightlife



Oevelgoenne Beach (Strandperle)

St. Pauli (e.g. Hamburger Berg)

One out of many possibilities for fitness: vafev.de



Volkspark:
Recreational
Area, jogging
etc.

Sports field which
can be booked,
send an email with name
phone number, date and
time to sportplatz@desy.de

Vafev has some
swimming pool!

Jogging to/at the Elbe (its 2-3 km to there
and very beautiful to run along the Elbe river)

This & That

- . Bikes: at DESY there is a Stadtrad station <http://stadtrad.hamburg.de>
- . Discover Hamburg with a boat – take ferry line 62, you can use standard public transport tickets



- . Drinking water: in Germany you can drink the water from the tap, it has highest purity, better than mineral water, no need to boil it

We have to talk about ...



- . The picture file is named “Typical_Hamburg_weather.jpg”
- . Weather can change quickly here, please check weather forecasts, e.g. search for “wetteronline.de Hamburg”

Typical Hamburg Dishes



Labskaus

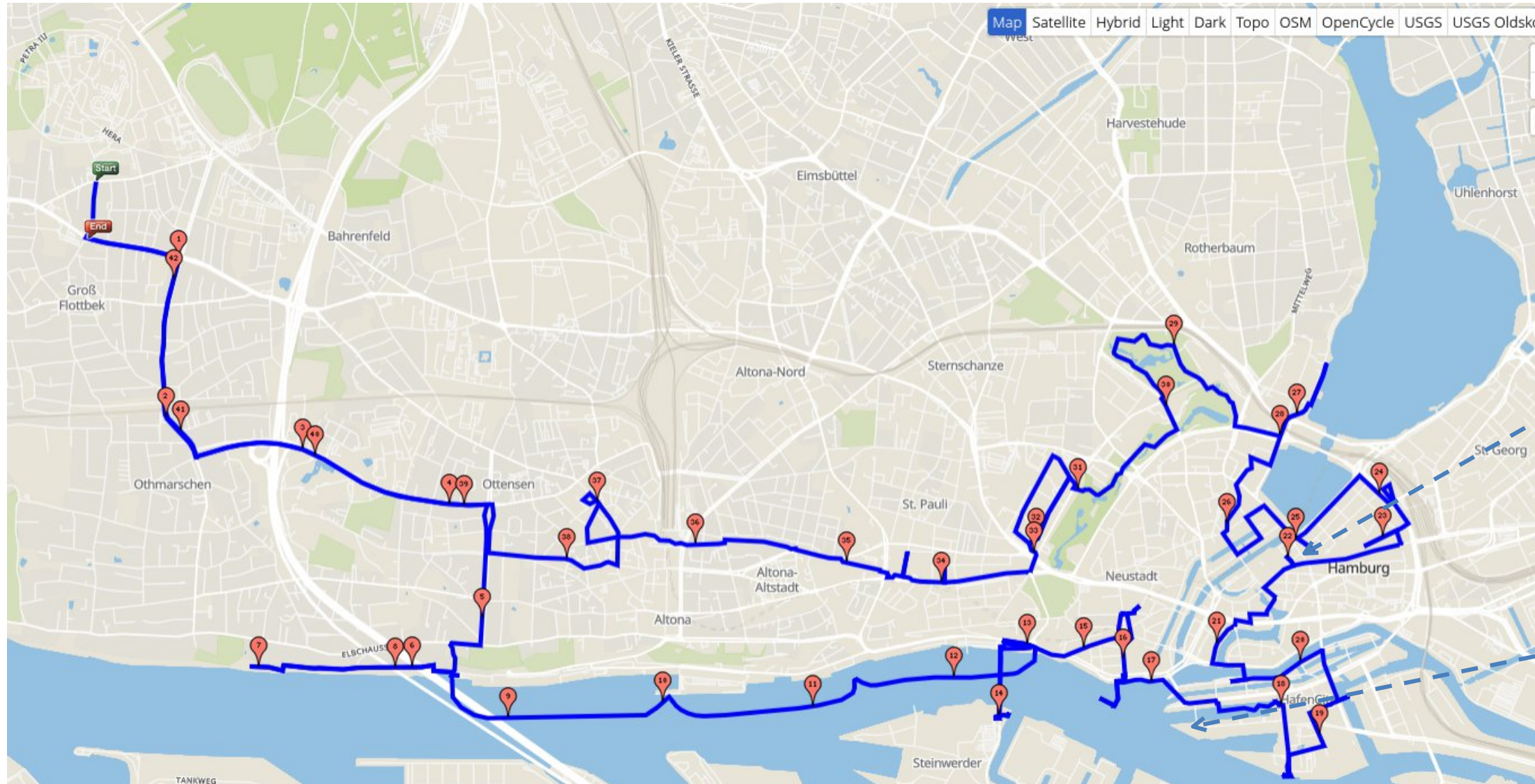


Rote Gruetze mit
Vanillesauce

Touristic Information

See this „Touristic Marathon Tour through Hamburg“ with highlight's description at

<https://indico.desy.de/event/23736/attachments/33097/41554/obehnke190719.pdf>



Next steps today..

10:30 AM

Hamburg intro session

🕒 2h 30m

📍 Hörsaal and Foyer

10:30-11:00 Introduction and organisational topics relevant for students staying in Hamburg

← Now

11:00-11:30 Administrative issues: handling of agreement forms, insurance & cashier's checks

← Next

11h30-13h00 Guided Trip to bank and redemption of checks

←

13h00-14h00 Lunch Break in Canteen

←

2:00 PM

Hamburg Session:

Afternoon:

14:00-15:00 Safety Training (Hörsaal)

←

15:00-15:30 Meet and Greet of the Students and their project supervisors (Hörsaal Foyer)

←

17:00-19:00 Welcome reception for winter students in Hamburg (Hörsaal Foyer)

←

- Students meet research group members and PIs

- Group photo