HERCULES

European School

Neutrons and synchrotron radiation for science

EXPERIMENTAL TRAINING

from 20th to 24th March at:

> ALBA *in Barcelona, Spain*
> DESY and European XFEL *in Hamburg, Germany*
> ELETTRA/FERMI *in Trieste, Italy*
> PSI/SLS *in Villigen, Switzerland*

and the other weeks at:

> CEA, CNRS, ESRF, IBS, ILL *in Grenoble, France*

27th February to 31st March

Grenoble, FRANCE

ON-LINE APPLICATION OPEN FROM
1st September to 15th October 2022
https://hercules-school.eu

CONTENTS

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Université Grenoble Alpes (UGA)
Grenoble INP-UGA Institut d'ingénierie et de management

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- Institut Laue Langevin (ILL)
- Institut de Biologie Structurale (IBS)
- Deutsches Elektronen-Synchrotron (DESY)
- European XFEL
- Centre National de la Recherche Scientifique (CNRS):
  Institut National de Physique & Laboratoires du Polygone Louis Néel, Grenoble
- Commissariat à l'énergie atomique (CEA):
  Direction de la Recherche Fondamentale (DRF)
- Synchrotron SOLEIL
- Swiss Light Source (SLS) - Paul Scherrer Institute (PSI)
- Karlsruhe Institute of Technology (KIT)

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GENERAL INFORMATION

HERCULES is a 5 weeks course designed for training students and scientists from European universities and laboratories in the field of neutron and synchrotron radiation.

It includes a common part during a week and a half, followed thereafter by two parallel sessions:

SESSION A:	SESSION B:
Physics and chemistry of condensed matter (56 full-time and 28 part-time* participants).	Biomolecular and soft condensed matter (24 full-time and 7 part-time* participants).

* part-time participants will attend only lectures on weeks 1, 2, 3, and 5

It is mainly organised from Grenoble, from the European Schools Office on the Presqu'île Scientifique, where the Institut Laue Langevin (ILL) and the European Synchrotron Radiation Facility (ESRF) are also located.

The HERCULES course includes lectures (for all participants) together with practicals, labs, tutorials, visits of large scale facilities, and a poster session (for full-time participants only).

The HERCULES 2023 school will be organised on site for all full-time participants and online for the part-time ones. Weeks 1, 2, 3, and 5 will take place at **ILL** and **ESRF**, both located on the **EPN campus** (see map on page 11), while week 4 (from 20 to 24 March) will take place outside Grenoble, at one of the following partner facilities:

→ the Spanish synchrotron source **ALBA** near Barcelona,
→ the German synchrotron radiation facility Deutsches Elektronen-Synchrotron (**DESY**) and the **European XFEL** in Hamburg,
→ the Italian synchrotron light source **Elettra** and Free Electron laser Radiation for Multidisciplinary Investigations (**FERMI**) in Trieste,
→ the Swiss synchrotron radiation facility Swiss Light Source (**SLS**) and the Swiss spallation neutron source **SINQ** at the Paul Scherrer Institute (**PSI**) in Villigen.

The language of the course is **English**. The time zone is **Central European time** (**UTC+1 for weeks 1, 2, 3, 4**, and **UTC+2 for week 5**, following the time change occurring on Sunday 27 March in France).

TIMES OF LECTURES, PRACTICALS, LABS AND TUTORIALS

LECTURES organised from Grenoble

Most of the time (see timetables enclosed in the brochure):

- in the morning from 8:40 to 12:30 with a 30' coffee break at 10:20
- in the afternoon from 14:00 to 17:50 with a 30' break at 15:40

PRACTICALS, LABS, AND TUTORIALS organised from Grenoble

All practicals, labs, and tutorials start at 9:00 in the morning and 14:00 in the afternoon, and last about 3.5 hours. Practicals correspond to hands-on experiments at large scale facilities ILL and ESRF, Labs correspond to hands-on experiments in CNRS or IBS laboratories, while tutorials consist mostly in data treatment, without the experimental part.

IN CASE OF EMERGENCY – PHONE NUMBERS

SERVICE	CONTACT
SAMU (Emergency services)*	15
Police*	17
Pompiers (Fire brigade)*	18
Appel d'urgence européen (European emergency call)*	112
Centre Anti-Poison (Poisons unit)	04 76 42 42 42

** Free phone number*

PRACTICAL INFORMATION

WELCOME ON SUNDAY EVENING

Participants are expected to arrive in Grenoble on **Sunday 26th February 2023.**

When you arrive in Grenoble, whether it is by train, plane, or car, please **register at the HERCULES desk** in **the Aparthotel Adagio Grenoble Centre**, situated just behind the train station, at a few minutes' walk (see map on next page), **between 6:00 PM and 9:00 PM**.
A 'buffet' for dinner will be served at the hotel from 7:00 to 9:00 PM.

ACCOMMODATION

62 participants will stay in the following hotel:
Aparthotel Adagio Grenoble Centre
6 rue Auguste Genin - 38000 GRENOBLE
Tel: +33 (0)4 76 39 20 00
Fax: +33 (0)4 76 84 16 83
Mail: hb2r8_at_adagio-city.com

8 participants will stay in the following hotel:
Residhotel Le Central'Gare
8 place de la gare - 38000 GRENOBLE
Tel: +33 (0)4 76 50 77 88

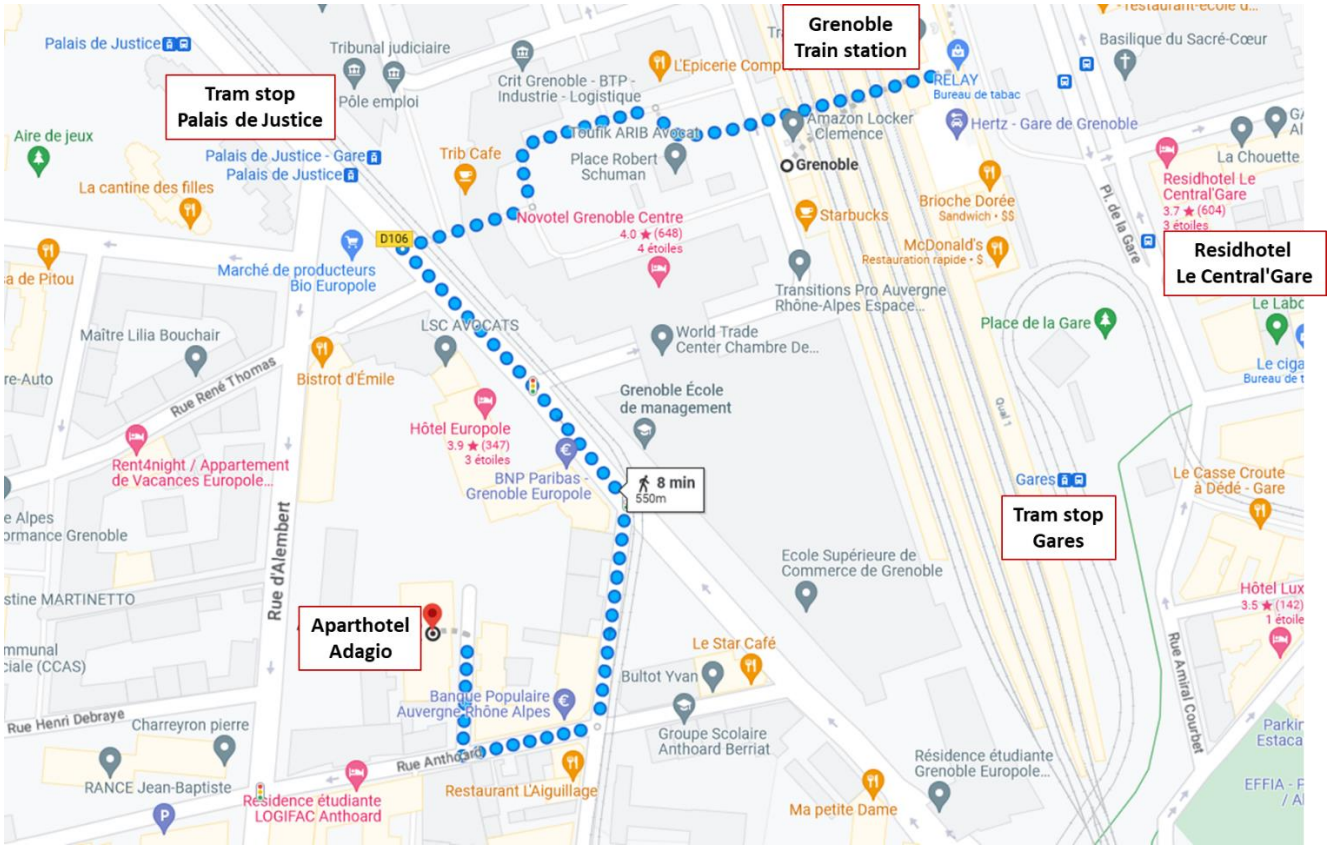
This one is located right in front of the tram stop "Gares"
Next to the train station (see map on next page)

Small studio flats are booked from Sunday 26th February evening to Saturday 1st April morning in Grenoble and accommodation is organised for the nights in Barcelona, Trieste, Hamburg and Villigen. A room will be specially booked in Grenoble to store your luggage during the travel outside Grenoble, while you will need to free you room during this week.

Both hotels are close to bus and tram stops.

MAP AND INFORMATION TO GO TO THE HOTEL AND TO THE EPN CAMPUS:

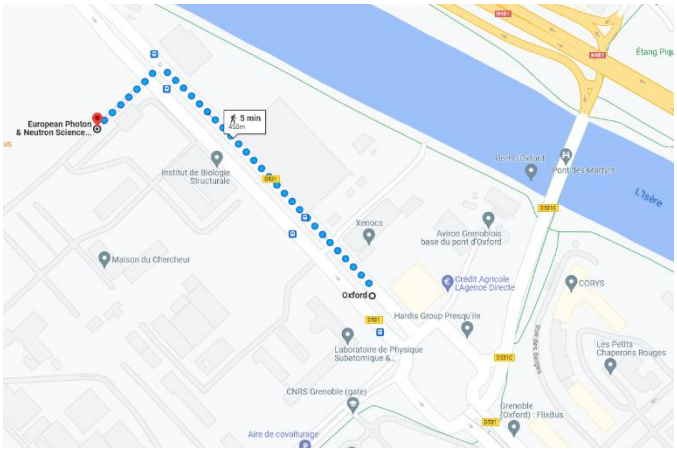
The map below shows the way from the Grenoble train station to the Aparthotel where the Hercules school welcome is organised on Sunday evening, together with the location of the two hotels, where the participants will be accommodated in Grenoble.
The two tram stops, where to take the tram B to go to the EPN campus are also shown: tram stop "Palais de Justice" from the Aparthotel Adagio, tram stop "Gares" from the Residhotel Le Central'Gare.



To go to the EPN campus:

- Take the **B line, "Oxford" direction**, at tram stop "Palais de justice" or "Gares"
- Get off at the "Oxford" stop, terminus.
- Continue to walk in the same direction, along "avenue des Martyrs", then turn left towards the EPN campus site entrance

NB: You can also go by walk from the hotel (about 35 minutes' walk)



To enter the EPN campus, you will have to bring:
- YOUR **PASSPORT OR ID CARD**, on the first day
- YOUR **EPN CAMPUS BADGE**, on the following days

MAP OF THE EPN CAMPUS AND MEETING POINT ON MONDAY MORNING, FOR THE FIRST DAY OF THE SCHOOL:

- The **meeting point on Monday 27th February** will be **at 8:30, 9:00, or 9:30** (depending on the participants*) at the **site entrance of the EPN campus**. After having shown your passport or ID card, your EPN badge will be distributed to you there.

**this information will be given at the hotel, during the welcome on Sunday evening.*

Then, you will be guided to the ILL50 building, where a 4-digit code will be given to you, necessary to enter the ZAC (Zone Accès Contrôlé) of ILL.

IMPORTANT:
Your EPN badge and this code will be needed every day to enter the EPN campus and the ZAC

- In the map of the EPN campus shown below, the site entrance and the locations where the lectures will take place are enlightened (ILL4, CIBB, and central ESRF buildings).

ESRF
IBS
ILL
EMBL

ESRF

- (A) Central Building & Reception
- (B) Visitor Centre
- (C) Safety training
- (D) Experimental Hall
- (E) Control Room

ILL

- (0) ILL50 ILL Entry point (ZAC access badge) Remote instrument control rooms
- (1) ILL1
- (2) ILL2
- (3) ILL3 ILL stores
- (4) ILL4 Chadwick amphitheatre Seminar room & Offices
- (5) ILL5 Reactor building Experimental hall
- (6) ILL22 Experimental hall
- (7) ILL7 Experimental hall
- (8) ILL17
- (9) ILL9 Works council building
- (10) ILL26
- (11) ILL19 IT building

Site entrance
Science building
CIBB building

Medical Service
Guest House
Restaurant & Cafeteria
Scientific Library

LAPTOPS AND WIRELESS ACCESS ON THE EPN CAMPUS:

- The participants are strongly recommended to bring their laptops, as they will need it for most of the tutorials, and for some of the labs and practicals.

- The participants will be able to connect to the ILL and EPN WiFi by using the login and password of their **ILL user accounts** (created in the ILL user club).

From the ILL: connect to "ILL Scientific Visitors" with your **login** as username
From CIBB, IBS, and ESRF: connect to "EPN Visitors" with **login@ill.fr** as username

LOCATION OF THE HERCULES OFFICE:
Clotilde, Isabelle, Youlia, and Joseph will answer your questions

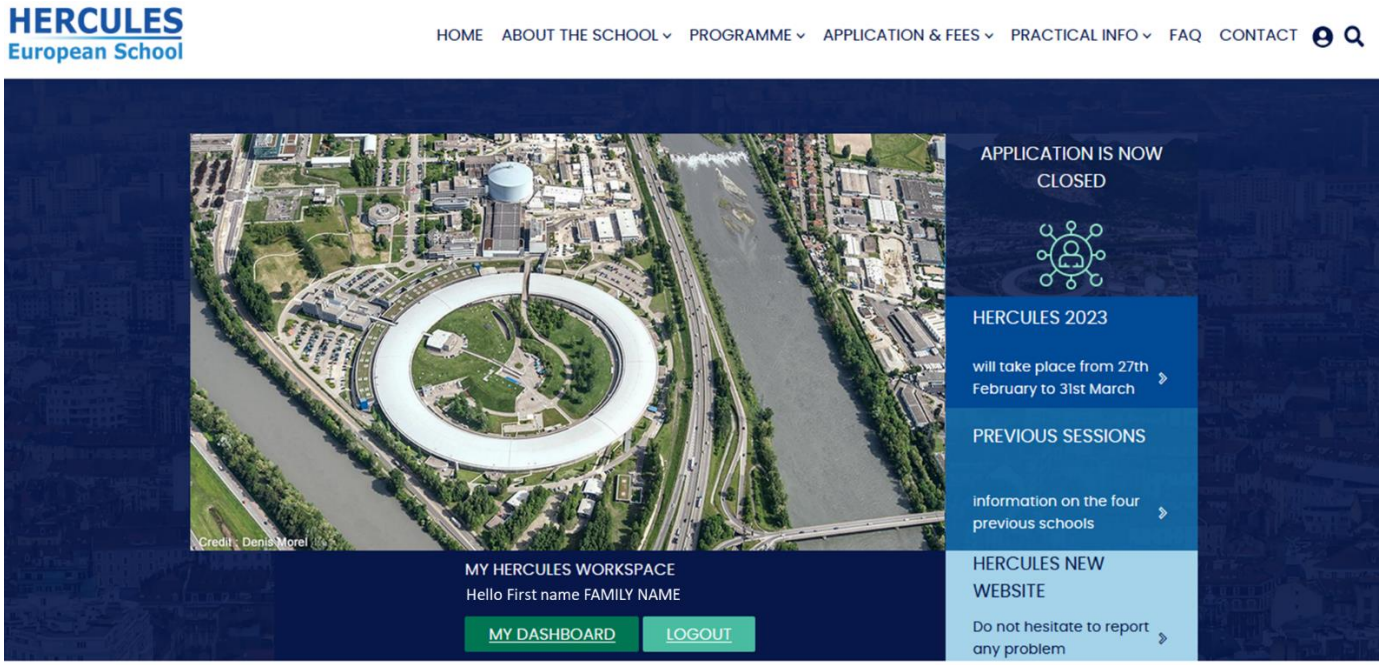
Weeks 1 and 2: in ILL4 building, 5th floor, room 508

Weeks 3 and 5: in the ESRF Central Building, 2nd floor, room 209
If you need to see the HERCULES team in this office, please stay discreet enough not to disturb the colleagues in the neighbouring offices.

GENERAL INFORMATION ABOUT THE HERCULES WEBSITE

https://hercules-school.eu

In case of any problem, please **report at** webmaster_at_hercules-school.eu



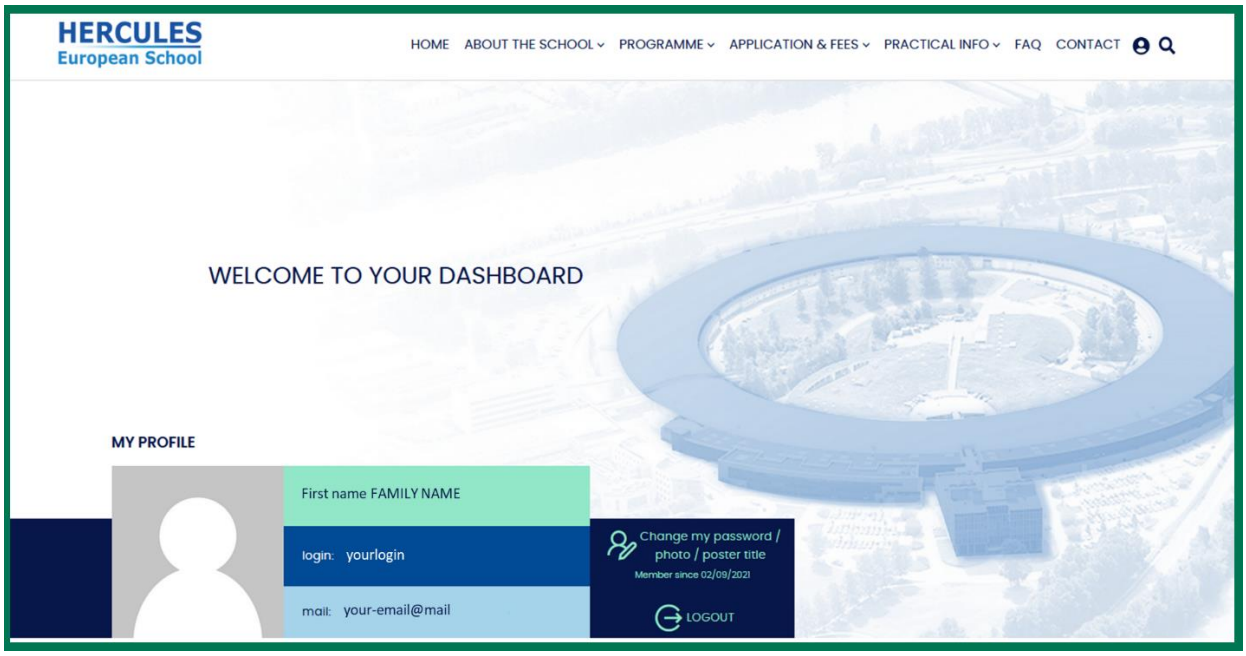
The Hercules participants will be brought to use the HERCULES website a lot during the school, for the schedule, the evaluations of the classes, the portrait galleries, …

To do so, the participants will have to **connect everyday with their login and password**, and then go on their **dashboard** MY DASHBOARD → https://hercules-school.eu/my-dashboard

If still logged in from the previous day, it is recommended to **refresh this page every morning**.

On the next pages are screen captures of "MY DASHBOARD" web page, from the top to the bottom of the page, followed by some explanations.

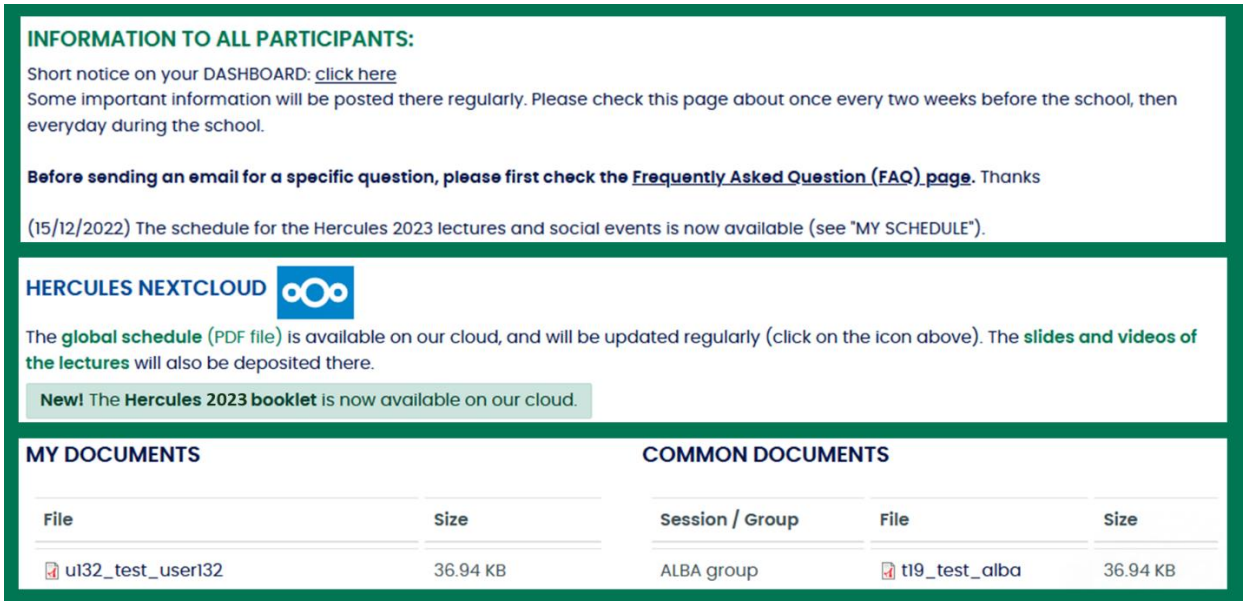
Note that the website also contains some piece of additional practical information, e.g., about the poster session, public transportation in Grenoble, … (no need to be connected for these).



▸ MY PROFILE

The participants can see here the information about their profile on the website and, by clicking on "Change my password / photo / poster title", they can **change** their **password**, their **photograph** or, for the full-time participants only, their **poster title**.

If they wish to change their login or e-mail address, they have to send an e-mail to hercules_at_hercules-school.eu.



▸ INFORMATION

This part (some typical extracts are shown here) will be updated constantly during the school. **All last-minute information and useful links will be posted here**.

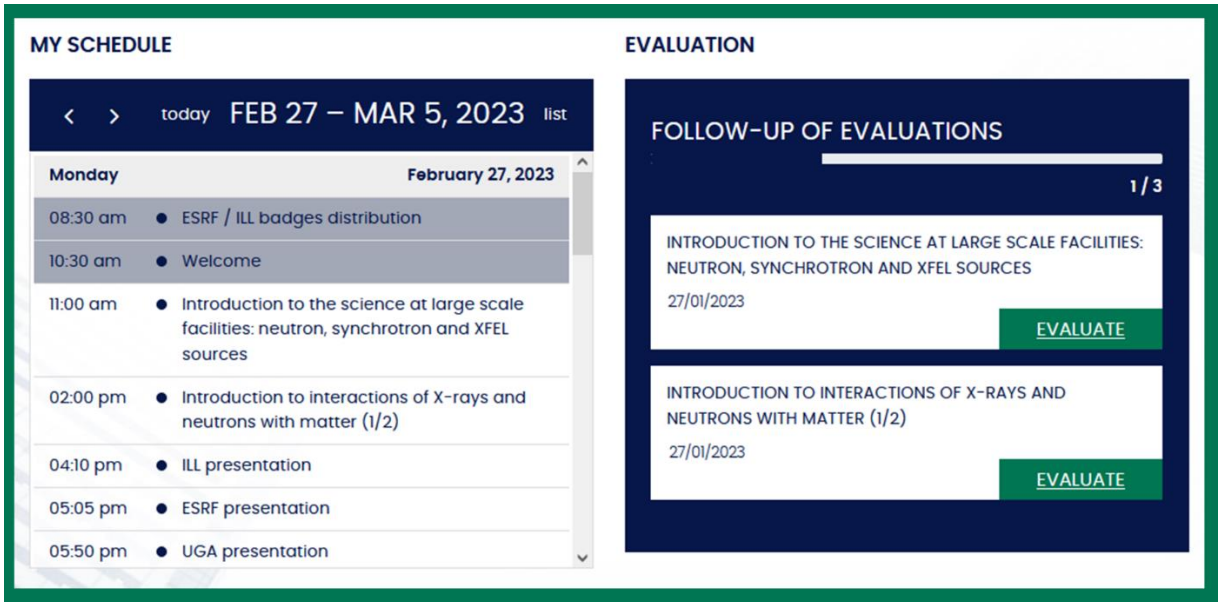
The final evaluation of the school will also be accessible from here.

MY DOCUMENTS

All personal documents like, e.g., the nominative certificate of attendance, delivered at the end of the school, will be uploaded in this space, and will be visible only by the concerned participant.

COMMON DOCUMENTS

All documents common to the entire Hercules session (e.g., the booklet) or to a specific group (e.g., concerning the travel to the partner facility), will be deposited here, and visible only by the concerned participants.



MY SCHEDULE

The participants will see their complete schedule during the school (except week 4, for the partner sites):

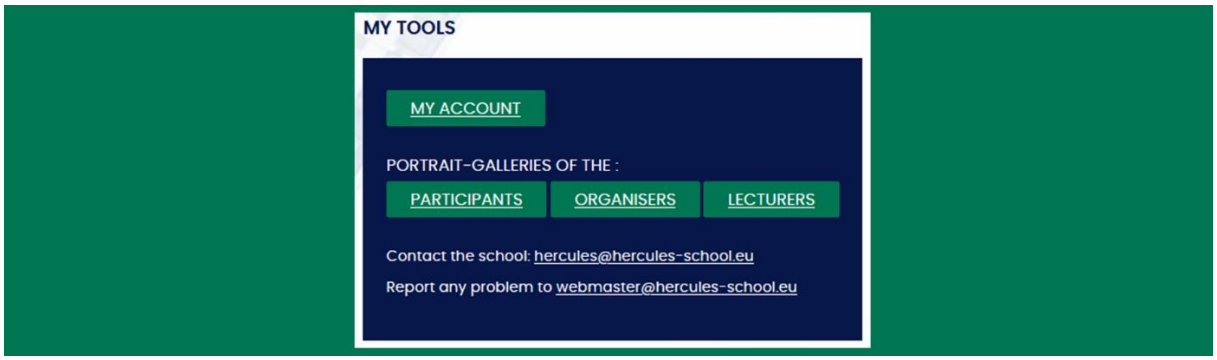
- Lectures from the common (●), A (●) or B (●) session
- Practicals / labs / tutorials in small groups from the A (●) or B (●) session
- Other events (welcome cocktail, questions on lectures, poster session, …)

By clicking on one of these events, additional information can be found: lecturer/instructor for lectures/hands-on trainings, summary, location (for on-site participants) and Zoom link (for online participants) …

Always use this "MY SCHEDULE" tool to find the lecture room or Zoom link

EVALUATION

The participants will have to fill in day-by-day the evaluation for each lecture, practical, … The date and time, as well as the lecturer/instructor names, are recalled after clicking on "EVALUATE", then a few questions are asked (it will take you only a few seconds to a few minutes, if you leave comments, for each of them). The evaluations will automatically appear here once they are passed and **the "follow-up of evaluations" will allow the participants to check that they are up to date with their evaluations**.



MY ACCOUNT

A few additional information is given here, in particular, the **session and group** of the participant, as well as the **reference number** (a01, a02, …, b01, b02, ….) used in the booklet for the practicals / labs / tutorials schedules in Grenoble (full-time participants only).

This yields to the same web page as when clicking on the icon in the top bar menu.

PORTRAIT GALLERIES

The **photographs** of all participants, organisers (in Grenoble and partner sites), and lecturers teaching in Grenoble are displayed after clicking on the corresponding button.

PARTICIPANTS portrait gallery: The participants can use the **SEARCH tool** (see below) to find a given participant (through his Surname / Family name, Name, or Reference number) or to filter on the A or B session or on a group (part-time, full-time, ALBA group, …). By clicking on the photograph of a given participant, the information on his/her session and group is given, and an e-mail can be sent to him/her.

LECTURERS and ORGANISER portrait galleries: Similarly, a search on the Location / Partner site (Grenoble, ALBA, …) can be done for the organisers, while a search on the session (common, A, or B) can be done for the lecturers, in addition to the search by name.

LIST OF FULL-TIME PARTICIPANTS:

The site and group for week 4 are indicated,
as well as the reference number (#) for practicals taking place during weeks 2, 3, and 5

SESSION A

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ALESSIO	Andrea	DESY-EuXFEL	A2	a02
BAKEN	Annet	PSI	A4	a03
BASSOT	Nathan	Elettra-FERMI	A2	a04
BEHR	Dylan	PSI	A1	a05
BHASIN	Vidha	DESY-EuXFEL	A4	a06
BRIOSCHI	Marta	PSI	A4	a07
CHATZOGIANNAKIS	Dimitrios	Elettra-FERMI	A3	a08
COPPI	Chiara	DESY-EuXFEL	A1	a09
DORA	Johannes	ALBA	A3	a11
DUARTE ANAYA	Enmanuel	DESY-EuXFEL	A1	a12
EL-DAHSHAN	Omar	PSI	A2	a13
ELMAHJOUBI	Abdelmajid	DESY-EuXFEL	A4	a14
GALA	Mateusz	ALBA	A1	a15
GARCÍA MANUZ	Inés	PSI	A3	a16
GARRIVIER	Natan	DESY-EuXFEL	A2	a17
GE	Yuqing	Elettra-FERMI	A2	a18
GRACIA	David	PSI	A1	a19
HANSON	Lise	Elettra-FERMI	A1	a20
HOVANČÍK	Dávid	Elettra-FERMI	A1	a21
HU	Zexiang	Elettra-FERMI	A1	a22
JUNKERS	Laura Susanne	ALBA	A2	a23
KLEPACKA	Marta Krystyna	PSI	A2	a24
KUMAR	Vikram	DESY-EuXFEL	A3	a25
LADBROOK	Evangeline	Elettra-FERMI	A3	a26
LE HOUX	James	DESY-EuXFEL	A3	a27
LI	Hang	Elettra-FERMI	A3	a28
LÜBKE	Erik	PSI	A2	a29
LURGO	Florencia Emilse	ALBA	A3	a30
MATZDORFF	David	Elettra-FERMI	A2	a31
MAZZARIOL	Chiara	ALBA	A2	a32
MELO NOGUEIRA ROSA GOMES	Mariana	Elettra-FERMI	A3	a33
MINIOTAITE	Ugne	ALBA	A3	a34
NIELSEN	Hannah Hedegaard	ALBA	A1	a35

FAMILY NAME	First name	Site	Group	#
NIELSEN	Tobias Mølgaard	ALBA	A3	a36
NIERHAUVE	Alena	PSI	A1	a37
O'CONNOR	Ryan	PSI	A4	a38
PIEKARA	Anna	Elettra-FERMI	A2	a10
RESCH	Christoph	ALBA	A2	a39
RÖPER	Sina	Elettra-FERMI	A3	a40
RUSTA	Nicoletta	DESY-EuXFEL	A1	a41
SEBASTIANI	Eugenia	ALBA	A2	a42
SKAUTVEDT	Casper	DESY-EuXFEL	A1	a43
SOBCZYK	Maciej	PSI	A3	a44
STAŠKO	Daniel	ALBA	A1	a45
TALEBI	Parisa	Elettra-FERMI	A1	a46
TERTOV	Ilia	PSI	A3	a47
VIALLET	Tristan	PSI	A1	a48
VILLA	Ilaria	Elettra-FERMI	A1	a49
WU	Yu-Hao	DESY-EuXFEL	A4	a50
XU	Mingfeng	PSI	A3	a51
YAO	Lipeng	DESY-EuXFEL	A3	a52
YAO	Zisheng	DESY-EuXFEL	A2	a53
YU	Wan-Ju	DESY-EuXFEL	A4	a54
ZELENIKA	Albert	Elettra-FERMI	A2	a55
ZHANG	Shengnan	PSI	A4	a56

SESSION B

FAMILY NAME	First name	Site	Group	#
ACHARYA	Atreyee	ALBA	B1	b01
AKHTAR	Mohammad Farhan	ALBA	B1	b02
ALLAN	Harry	PSI	B	b03
ARAGON GRAU	Carmen	PSI	B	b04
AYAN	Esra	DESY-EuXFEL	B	b05
CHIANG	Huat Thart	DESY-EuXFEL	B	b06
CROSS	Emily	ALBA	B1	b07
FREIHERR VON SCHOLLEY	Gian Luca	DESY-EuXFEL	B	b08
GE	Meng	ALBA	B1	b09
GÜNTER	Tim	Elettra-FERMI	B	b10
HAJIZADEH OMASLANOLYA	Mina	ALBA	B2	b16
KAWOŃ	Kamil	Elettra-FERMI	B	b11
KORSÁK	Marek	Elettra-FERMI	B	b12
KRUPNIK	Leonard	ALBA	B1	b13

FAMILY NAME	First name	Site	Group	#
MANNI	Mathieu	PSI	B	b14
MARQUARDT	Anja	DESY-EuXFEL	B	b15
MEILAND	Peter	PSI	B	b17
REHMAN	Sumera	PSI	B	b18
RUGIEŁ	Marzena	Elettra-FERMI	B	b19
SHEIKH	Sahadat	ALBA	B2	b20
SOTO GOMEZ	Noelia	ALBA	B2	b21
STUCKEY	Edward	Elettra-FERMI	B	b22
SUN	Han	ALBA	B2	b23
TELEK	Elek	DESY-EuXFEL	B	b24

LIST OF PART-TIME PARTICIPANTS

SESSION A

FAMILY NAME	First name
ABOSHARARA	Hanaa Abdelfatah
ALAM	Mohammad Akhlak
ALMEIDA DE CAMPOS	Leonardo
DAO	Thi Quynh Nhi
DITTRICH	Jan
GHANATHE	MADHU
ISLAM	Mijanul
KARANTH	Pranav
KAUR	Ravneet
KORDESTANI	Nazanin
KORJUS	Ove
KUMAR	Rahul
LAZAREVA	Elizaveta
LI	Ruyong

FAMILY NAME	First name
MAGNIN	Clara
MINZONI	Camilla
MISTRAL	Jules
NEDUMKULAM	Hridya
NORTH	Erlend
PIMENTEL	Carlos
RONCA	Alberto
RÖSCHE	Constanze
SADETSKAIA	Anatasiia
SARTORI	Andrea
SHON	Wonhyuk
THÉRON	Coline
VIBE	Peter
ZHOU	Wenju

SESSION B

FAMILY NAME	First name
AHMAD	Nabeel
AKTAS	Usame
COLARD	Thomas
GUO	Ruiqiao

FAMILY NAME	First name
MATHIEU	Eric
RICCI	Caterina
SHI	Zhenning

PROGRAMME of GRENOBLE

SCHEDULE FOR SESSION A

Last update 22/02/2023

Common lectures

Session A lectures

Other

@ILL: **ILL4 Building (ZAC)**, Ground floor, Chadwick Amphitheatre

@ESRF: **ESRF central Building,** Basement, ESRF Auditorium

@online: online lecture with zoom

WEEK 1: 27TH FEBRUARY – 3RD MARCH

	Monday 27	*Tuesday 28*	*Wednesday 1*	*Thursday 2*	*Friday 3*
8:40 – 9:25 10' break **9:35 – 10:20**	**8:30 – 10:30** **ESRF / ILL badges distribution**	@ILL Introduction to interactions of X-rays and neutrons with matter (2/2) *Andrew Harrison*	@ILL Neutrons: scattering and instrumentation (2/2) *Andrew Wildes*	@ILL Introduction to X-ray Spectroscopies *Sakura Pascarelli*	@ILL From a diffraction experiment to the crystal structure *Marc de Boissieu* @ILL Training on crystallography (1/2) *Claire Colin & Béatrice Grenier*
10:50 – 11:35 10' break **11:45 – 12:30**	@ILL **10:30 – 11:00** **Welcome** @ILL **11:00 – 12:40** Introduction to the science at large scale facilities: neutron, synchrotron and XFEL sources *Marc de Boissieu*	@ILL Neutrons: scattering and instrumentation (1/2) *Andrew Wildes*	@ILL Refresher lecture on crystallography (1/2) *Béatrice Grenier*	@ILL Refresher lecture on crystallography (2/2) *Béatrice Grenier*	@ILL Fundamentals of X-ray Absorption Fine Structure Spectroscopy *Sakura Pascarelli*
14:00 – 14:45 10' break **14:55 – 15:40**	@ILL Introduction to interactions of X-rays and neutrons with matter (1/2) *Andrew Harrison*	@ILL Introduction to synchrotron radiation, coherence and the evolution to free electron lasing *David Attwood*	**ILL / ESRF visit**	**ILL / ESRF visit**	@ILL XFELs and ultrafast applications *Sakura Pascarelli*
16:10 – 16:55 10' break **17:05 – 17:50**	@ILL **ESRF & ILL presentations (45' each)** **UGA presentation (10')**	@ILL Basic of X-ray detectors: How do they work and how are they characterised? *Heinz Graafsma*	@ILL X-ray optics and applications *David Attwood*	@ILL Training on basics about neutron and X-ray radiations (1/2)	@ILL **Questions on lectures** *(with lecturers of the week)*
	18:15 **Welcome cocktail**				**19:30** **Gala dinner**

SCHEDULE FOR SESSION A

WEEK 2: 6TH – 10TH MARCH

	Monday 6	Tuesday 7	Wednesday 8	Thursday 9	Friday 10
8:40 – 9:25 10' break **9:35 – 10:20**	@ILL Small angle scattering *Martin Müller*	**9:00 – 12:30** ***ESRF PRACTICALS*** *(in small groups)*	**9:00 – 12:30** ***ESRF PRACTICALS*** *(in small groups)*	@ILL Data science: from big & open data to cloud computing *Vincent Favre-Nicolin*	@ILL Introduction to neutron and X-ray inelastic scattering *Victor Balédent*
10:50 – 11:35 10' break **11:45 – 12:30**	@online @ILL Introduction to imaging techniques *Federica Marone*			@ILL Serial (femtosecond) crystallography *Thomas Barends*	@ILL Full-field coherent Imaging *Peter Cloetens*
14:00 – 14:45 10' break **14:55 – 15:40**	@ILL X-ray photon correlation spectroscopy *Gerhard Grübel*	**14:00 – 17:30** ***ESRF PRACTICALS*** *(in small groups)*	**14:00 – 17:30** ***ESRF PRACTICALS*** *(in small groups)*	**14:00 – 17:45** **POSTER SESSION**	@ILL **Questions on lectures** *(with lecturers of the week)*
16:10 – 16:55 10' break **17:05 – 17:50**	@ILL Powder diffraction *Radovan Cerny*				@ILL Training on crystallography (2/2) *Claire Colin & Béatrice Grenier*

SCHEDULE FOR SESSION A

WEEK 3: 13TH –17TH MARCH

	Monday 13	Tuesday 14	Wednesday 15	Thursday 16	Friday 17
8:40 – 9:25 10' break **9:35 – 10:20**	@ILL Hard X-ray optics for SR beamlines *Ray Barrett*	@online @ESRF Magnetic neutron diffraction *Navid Qureshi*	**9:00 – 12:30** ***ILL PRACTICALS*** *(in small groups)*	@ILL Neutron time of flight spectroscopy *Toby Perring*	@ESRF X-ray and neutron reflectometry *Oliver Seeck*
10:50 – 11:35 10' break **11:45 – 12:30**	@ILL Introduction to magnetism *Luigi Paolasini*	@ESRF Neutron triple axis spectroscopy *Bella Lake*		@ILL VLab: how to do your own ultrafast x-ray experiment *Christian Bressler*	@ESRF PDF-analysis of local structure in disordered materials *Henry Fischer*
14:00 – 14:45 10' break **14:55 – 15:40**	@ESRF Science at neutron spallation sources: exploiting accelerator based facilities *Sean Langridge*	@ESRF Polarized neutrons: theoretical and experimental techniques for the study of atomic, molecular and nanoscale systems *Sean Langridge*	**14:00 – 17:30** ***ILL PRACTICALS*** *(in small groups)*	@ESRF Polarized X-rays *Urs Staub*	**14:00 – 17:30** ***GROUP WORK:*** ***Treat your own data*** *OR* ***VLab: do your own ultrafast x-ray experiment*** *(in small groups)*
16:10 – 16:55 10' break **17:05 – 17:50**	@online @ESRF **16:10 – 17:10** Ancient materials research with synchrotron and neutron techniques *Sebastian Schoeder* @ESRF **17:20** DECTRIS presentation *Dubravka Sisak Jung* @ESRF **17:50** NFFA-EUROPE-PILOT presentation *Anthony Leonard*	@ESRF Training on basics about neutron and X-ray radiations (2/2, session A)		@ESRF High resolution inelastic X-ray scattering *Matthieu Le Tacon*	

SCHEDULE FOR SESSION A

WEEK 4: 20TH – 24TH MARCH: 'OUTSIDE' GRENOBLE

WEEK 5: 27TH – 31ST MARCH

	Monday 27	Tuesday 28	Wednesday 29	Thursday 30	Friday 31
8:40 – 9:25 10' break **9:35 – 10:20**	@ESRF Resonant diffraction *Vincent Favre-Nicolin*	@ESRF Coherent diffractive imaging and ptychography *Manuel Guizar-Sicairos*	@ESRF Magnetic X-ray and neutron reflectivity *Björgvin Hjörvarsson*	@ESRF Photoelectron spectroscopy from UV to soft X-rays *Hugo Dil*	
10:50 – 11:35 10' break **11:45 – 12:30**	@ESRF Neutron backscattering and spin-echo spectroscopies *Orsolya Czakkel*	@ESRF Dynamical diffraction theory *Tilo Baumbach*	@ESRF Soft condensed matter *Adrian Rennie*	@ESRF X-ray photoemission electron microscopy *Claus Schneider*	**9:20 – 10:20** @ESRF Materials for energy *Sandrine Lyonnard*
14:00 – 14:45 10' break **14:55 – 15:40**	**14:00 – 17:30** ***TUTORIALS / LABS*** *(in small groups)*	**14:00 – 17:30** ***TUTORIALS / LABS*** *(in small groups)*	@ESRF **14:00 – 17:30** ***"How to write a good proposal"*** *(session A)*	**14:00 – 17:30** ***TUTORIALS / LABS*** *(in small groups)*	@ESRF Disorder and its effects on neutron and X-ray diffraction *Marc de Boissieu*
16:10 – 16:55 10' break **17:05 – 17:50**					**16:10 – 17:10** @ESRF Hercules Mythology *Chris Buckley*
					17:20 – 18:20 @ESRF **EVALUATION MEETING**
					18:30 **Farewell wine and cheese**

PRACTICALS / LABS / TUTORIALS FOR SESSION A

Full-time participants only

Coordinators: Alejandro FERNANDEZ-MARTINEZ, Béatrice GRENIER, Lucile MANGIN-THRO, Fabrice WILHELM

Contacts:

@ILL	Béatrice GRENIER (grenier_at_ill.fr)	+33 (0)4 76 20 74 23
	Lucile MANGIN-THRO	+33 (0)4 76 20 75 71
@ESRF	Fabrice WILHELM	+33 (0)4 76 88 24 19
	Petra PERNOT	+33 (0)4 76 88 28 42

Part-time participants will not participate at all in week 4 and in practicals/labs/tutorials* organised by Grenoble. So, this section concerns only the **full-time participants**.

During the weeks 2, 3, and 5, organised by Grenoble, all full-time participants will carry out two practicals at Institut Laue Langevin (ILL) and four practicals at European Synchrotron Radiation Facility (ESRF), delivered mostly by instrument responsibles and beamline scientists. In addition, they will participate in tutorials and, for some of the participants, in labs, taught by staff / users of large-scale facilities essentially (three tutorials / labs in total). Last, a few participants will follow a tutorial on Vlab while all the others will work in small groups on data from one person of the group (group work).

All full-time participants will follow additional practicals / tutorials during week 4, spent at one of the following partner facilities: ALBA, DESY / European XFEL, Elettra / FERMI, or SLS / SINQ (PSI). Among these four groups, the participants have been distributed in groups of 3, 4, or 5 at the various sites (A1, A2, ... at each site). See the PROGRAMME OF PARTNER Section for the detailed programme there.

As concerns practicals / labs / tutorials in the programme of Grenoble, no fixed groups were made, but rather an individual and personalised schedule. Therefore, we assigned a number to each participant, for a better readability in the tables that will follow (a01 to a56). All the information regarding groups A1, A2, … and the numbering a01, a02, … can be found in the PRACTICAL INFORMATION section of this booklet (pages 17 – 18).

The complete practicals / labs / tutorials schedule was done in the best possible way (regarding the many constraints) with respect to the main research interests and wishes expressed. Each full-time participant will perform selected practicals and tutorials (and labs for some of them), as indicated in the following.

The list of all practicals / labs / tutorials (titles and instructors) in Grenoble is given in the following pages, together with the participants assignment, using the reference numbers a01, a02, …. The complete individual schedule for all participants can also be found on a separate PDF document.

The summaries of the practicals / labs / tutorials are available in MY SCHEDULE on the Hercules website: https://hercules-school.eu/my-dashboard (once connected).

All full-time participants are required to attend the entire practical / lab / tutorial programme assigned to them

** **Practical**: hands-on training on large scale facility instruments ; **Lab**: hands-on training on laboratory experiments ;*
__Tutorial__: data treatment (on synchrotron or neutron data recorded beforehand) or, for a few of them, simulations.

Practicals at ESRF

Meeting point on the mezzanine of ESRF central building 15 min. earlier

7th and 8th MARCH, 9:00 – 12:30 and 14:00 – 17:30

			7th March		8th March	
BEAMLINE	INSTRUCTOR(S)	TITLE	9:00	14:00	9:00	14:00
BM02 (1)	BLANC Nils, CHAHINE Gilbert, MORFIN Isabelle	Small Angle X-ray Scattering for soft matter system	a12 a18 a20 a41			
BM02 (2)	BEUTIER Guillaume, BLANC Nils, CHAHINE Gilbert, DUPRAZ Maxime	Forbidden reflections in a Germanium single crystal			a02 a19 a28 a33 a35	a05 a10 a46 a56
BM05 (1)	BARUCHEL José, TRAN CALISTE Thu Nhi	X-ray topography and Rocking Curve Imaging techniques	a04 a17 a23 a44 a53	a15 a32 a42 a55		
BM05 (2)	BOLLER Elodie, COOK Phil, DOLLMAN Kathleen	Synchrotron-based microtomography				a06 a31 a32 a54
BM08-LISA	DACAPITO Francesco, PURI Alessandro	Practical introduction to the EXAFS technique	a01 a10 a31 a48 a51	a02 a08 a49 a52	a05 a07 a09 a18 a26	a23 a28 a29 a34
BM23	RODRIGUES Joao, ROSA Angelika	X-ray absorption spectroscopy		a04 a46 a47 a53	a06 a14 a16 a43 a54	a12 a22 a27 a33
BM26	ROSENTHAL Martin	Synchrotron based Small and Wide angle X-ray scattering for in-situ experimentation		a16 a29 a35 a43	a01 a13 a17 a27 a31	a03 a14 a15 a24 a45
BM30	PROUX Olivier, ROVEZZI Mauro, TESTEMALE Denis	X-ray absorption spectroscopy			a20 a24 a25 a50	a17 a40 a44 a55
ID01 (1)	LEAKE Steven VOSTROV Nikita	Wavefront reconstruction and Bragg coherent diffraction imaging	a02 a13 a26 a47 a55			a11 a37 a51 a53
ID01 (2)	ZATTERIN Edoardo CHATELIER Corentin	Scanning X-ray Diffraction Microscopy		a17 a28 a36 a40	a21 a22 a29 a38 a55	
ID09	LEVANTINO Matteo, MARIETTE Céline	Time-resolved X-ray scattering	a32 a36 a40 a42 b24			a07 a09 a26 a41 a38
ID11	LAWRENCE BRIGHT Eleanor	Diffraction tomography based techniques	a03 a11 a21a43 a56	a06 a10 a25 a38		
ID12	WILHELM Fabrice	Hard X-ray XMCD	a05 a15 a30 a37	a19 a22 a39 a45		
ID15B	HANFLAND Michael	Crystallography in a diamond anvil cell	a25 a27 a33 a34 a35	a05 a09 a24 a26		
ID16A	KARPOV Dmitry	Synchrotron-based X-ray nanotomography		a01 a07 a11 a14	a08 a12 a15 a36 a40	a02 a04 a16 a18
ID19	BROCHE Ludovic, LUKIC Bratislav, MAJKUT Marta, RACK Alexande	Synchrotron - Tomography	a22 a24 a29 a49 a52	a30 a37 a51 a56	a42 a45 a46 a48	
ID21	COLOCHO HURTARTE Luis Carlos	Multi-modal micro-analyses for cultural heritage			a39 a47 a53 a56	a30 a42 a43 a50
ID22	CONFALONIERI Giorgia, GRENDAL Ola	High resolution powder diffraction	a06 a14 a19 a45 a50	a23 a31 a34 a48		
ID26	GLATZEL Pieter	Aligning an X-ray emission spectrometer	a08 a28 a38 a39 a46	a13 a21 a27 a54		
ID27	MEZOUAR Mohamed, POREBA Tomasz	Structure of materials under high pressure			a03 a23 a37 a52	a01 a19 a39 a48
ID31	DRNEC Jakub, MIROLO Marta	XRD on carbon materials (PDF, SAXS)			a10 a30 a32 a44 a51	a13 a20 a25 a36 a47 a49
ID32	BROOKES Nicholas, VASCONCELOS Pamella	Soft X-ray XMCD (X-ray Magnetic Circular Dichroism)	a07 a09 a16 a54	a03 a33 a44 a50	a04 a11 a34 a41 a49	a08 a21 a35 a52

Practicals at ILL

Meeting point in the hall of ILL4 building 10 min. earlier

NEUTRONS FOR SOCIETY

15th MARCH, 9:00 – 12:30 and 14:00 – 17:30

			15th March	
INSTRUMENT	**INSTRUCTOR(S)**	**TITLE**	**9:00**	**14:00**
D1B (1)	COLIN Claire, LAVERSENNE Laetitia	Structural determination of energy materials by Neutron Powder Diffraction	a01 a08 a29 a54 a56	
D1B (2)	NASSIF Vivian, PUENTE ORENCH Ines	Diffraction of nanoparticles		a13 a20 a24 a36 a40
D9	FABELO Oscar, RODRIGUEZ VELAMAZAN J. Alberto	Single crystal nuclear and magnetic diffraction	a15 a21 a42 a45 a48	
D17	DALAL Kamaldeep, SAERBECK Thomas	Reflectometry on magnetic thin films	a06 a27 a35 a39	a09 a43 a18 a42 a54
D19	CANADILLAS-DELGADO Laura, FABELO Oscar	Single crystal measurements on the thermal neutron diffractometer D19	a11 a26 a32 a37 a50	a06 a27 a38 a16 a51
D20	FABELO Oscar, RODRIGUEZ VELAMAZAN J. Alberto	Magnetic powder neutron diffraction	a04 a18 a30 a49	
D33	CUBITT Robert	Neutron scattering and vortex matter in superconductors	a02 a10 a33 a34	a04 a05 a19 a48 a55
IN1-Lagrange	JIMENEZ-RUIZ Monica	Neutron Vibrational Spectroscopy	a14 a24 a25 a40 a52	a10 a26 a37 a41 a44
IN8	PIOVANO Andrea	Phonon Renormalization in $RuCl_3$ on a three-axis spectrometer	a12 a28 a38 a41 a53	a02 a11 a17 a23 a50
IN16B	APPEL Markus, SEYDEL Tilo	High resolution spectroscopy on cold neutron backscattering spectrometers	a03 a13 a31 a36 a43	a08 a14 a29 a35 a46
NeXT	TENGATTINI Alessandro	Neutron and X-ray Tomography and Image processing (visit only)		a03 a12 a22 a47 a53 a56
PANTHER	PETIT Sylvain, ROLS Stéphane	Magnetic and nuclear excitations on a thermal Time of flight neutron spectrometer	a05 a07 a09 a17 a51	a21 a31 a34 a45 a49
SALSA	CABEZA Sandra, PIRLING Thilo	Neutron Strain Scanning for Engineering Applications	a23 a46 a47 a55	a01 a25 a28 a32 a52
WASP	FOUQUET Peter	Neutron Spin-Echo Spectroscopy	a16 a19 a20 a22 a44	a07 a15 a30 a33 a39

Additional information about the ESRF and ILL practicals:

You will be contacted by your instructor in case you should bring your laptop and install some particular software beforehand. Also check this information in MY SCHEDULE on the Hercules website.

NB: - Note that the practical **BM02 (1)** on 7th March at ESRF lasts the entire day.
- On 7th March morning, a participant from the B session will join for the ESRF practical on **ID09**.
- **NeXT** at ILL on 15th March with not be a practical but a tutorial with a visit of the instrument.

You can find information on the various **ESRF beamlines** and **ILL instruments** at the following URLs:
https://www.ill.eu/users/instruments/instruments-list
https://www.esrf.fr/home/UsersAndScience/find-a-beamline.html

Tutorials and X-ray Labs

Meeting points: see next page

27th, 28th, and 30th MARCH, 14:00 – 17:30

TUTORIAL	INSTRUCTOR(S)	TITLE	LOCATION	27th March	28th March	30th March
Bilbao THz	DE BRION Sophie	Introduction to symmetries using Bilbao Crystallographic server. Applications in the THz domain.	ESRF			a05 a07 a09 a26 a33 a48
CDI ptycho	FAVRE-NICOLIN Vincent	Coherent imaging data analysis (CDI, Ptychography, holo-tomography) using PyNX	ESRF		a15 a25 a51 a53	a27 a40 a50 a54 a55
GSAS	TOBY Brian	Intro to GSAS-II *(on Zoom, from 15:00 to 18:30)*	ILL		a13 a31 a27 a41 a50	a08 a10 a20 a23 a24 a44 a53
JANA	HENRIQUES Margarida, PETRICEK Vaclav, POUPON Morgane	Refinement of crystal structures in Jana2020 *(on Zoom)*	ILL			a03 a14 a19 a43 a46 a56
JANA mag	*same instructors as for JANA*	Refinement of crystal and magnetic structures in Jana2020 *(on Zoom)*	ILL		a05 a07 a09 a30 a39	
MAG DIF	PADDISON Joseph	Magnetic diffuse scattering *(on Zoom)*	ILL	a05 a20 a30 a33		a04 a18 a35 a45 a49
McStas	WEBER Tobias	Simulating neutron scattering using McStas	ILL	a01 a18 a29 a39		
micro LAUE	MICHA Jean-Sébastien, TARDIF Samuel	Laue microdiffraction	ESRF	a11 a14 a31 a53 a55		a02 a06 a12 a13 a29 a37 a38
OASYS	SANCHEZ DEL RIO Manuel, REYES-HERRERA Juan	Modelling synchrotron radiation beamlines with Oasys	ESRF	a26 a37 a38 a46		a11 a17 a31 a36 a39 a52
PDF-CT	CHECCHIA Stefano	Pair Distribution Function Computed Tomography (PDF-CT)	ESRF	a12 a41 a42 a43 a52 a56		
Ptycho TOMO	DA SILVA Julio Cesar	PXCT - Ptychographic X-ray Computed Tomography	ESRF	a06 a07 a16 a28	a02 a17 a37 a46	
pyFAI	KIEFFER Jerome	Scattering data: calibration and reduction with pyFAI	ESRF		a03 a10 a26 a38 a52	
QENS	BERROD Quentin	QENS applied to materials for energy	ILL		a08 a12 a36 a43 a54	a01 a32 a41 a47 a51

TUTORIAL	INSTRUCTOR(S)	TITLE	LOCATION	27th March	28th March	30th March
Reflecto lab	MOSSANG Eric	X-ray reflectometry and grazing incidence diffraction	CNRS – F221	a08 a13 a44 a50		
RIXS	NICOLAOU Alessandro	Resonant inelastic X-ray scattering in the soft X-ray regime for quantum materials	ESRF	a09 a15 a25 a27 a48 a49	a01 a11 a18 a21 a34 a40 a44	
SPINWAVE	SONGVILAY Manila	Linear spin wave calculations using the Spinwave software	ILL			a16 a21 a30 a34
TAS	BOUNOUA Dalila	Phonon dispersion in CaF2	ILL	a04 a21 a22 a34 a54	a06 a14 a20 a45 a49 a55	
TOF	PETIT Sylvain	Spin dynamics in Mn12 acetate *(on Zoom)*	ILL	a23 a24 a35 a47	a19 a28 a33 a42 a56	
Tomo CDI	ZONTONE Federico	Tomographic Coherent X-ray Diffraction Imaging in practice	ESRF		a22 a23 a29 a32 a47	
XAS 1	JOLY Yves	X-ray absorption simulations	ESRF	a03 a19 a32 a36 a40 a45		
XAS 2	RETEGAN Marius	X-ray spectroscopy calculations using multiplet approaches	ESRF		a04 a16 a24 a35 a48	a15 a22 a25 a28 a42
XPD lab	LEYNAUD Olivier	X-ray Powder diffraction	CNRS – F217	a02 a10 a17 a51		

For some tutorials, you will need to **install specific software beforehand**, to be able to do the data treatment. In that case, your instructor will send you an email before the tutorial and/or will give this information in the summary of the tutorial on the Hercules website. **If you have no computer or do not have the required OS system** for a particular tutorial, you may either share a laptop with another participant or borrow a PC Windows laptop, assuming there is still one available (send an email to grenier_at_ill.fr).

NB: - the **GSAS** tutorial (on Zoom) will start an hour later (15:00 – 18:30).
- the **micro LAUE** and **SPINWAVE** tutorials will take place in a room equipped with PC Windows computers.
- the **PDF-CT** tutorial will include a visit of the ID15A beamline at ESRF.

Meeting points:

Hall of ILL4 building for the tutorials taking place at ILL
Hall of ESRF central building for the tutorials taking place at ESRF

Go directly to room F221 or F217 for the labs taking place at **CNRS site**
(see map on page 31 ; sign posting from the ground floor of F building)
Careful: all together, it should take about 15 minutes to get there from the EPN campus

Clearance + passport or ID NEEDED at the entrance

Vlab tutorial and group work

17th MARCH, 14:00 – 17:30

Meeting points: see below tables

Each full-time participant will either participate in a group work or follow the Vlab tutorial.

VLAB TUTORIAL

Some participants from the B session will join for this tutorial.

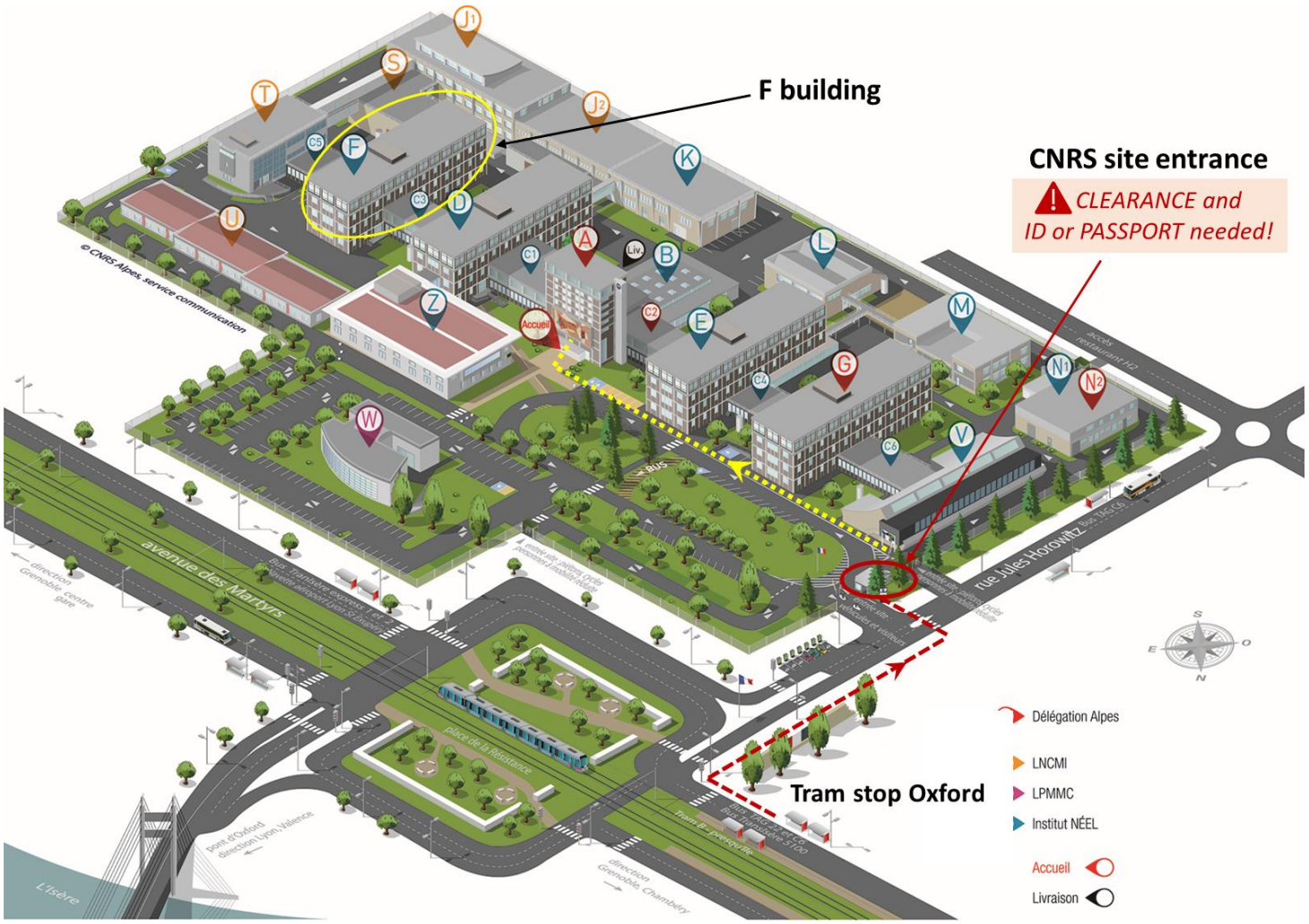
TUTORIAL	INSTRUCTOR	TITLE	LOCATION	PARTICIPANTS
Vlab	BRESSLER Christian	VLab: do your own ultrafast X-ray experiment	ESRF	a07 a21 a22 a33 a37 a41 a46 b03 b13 b16

GROUP WORK

During the group work session, the participants bringing their data will be asked to prepare the group work session and animate it. Their reference number is enlightened in bold purple. Experts from this field will also be present to explain some data treatment and/or try to answer questions about your data analysis.

GROUP WORK	EXPERT(S)	TITLE	LOCATION	PARTICIPANTS
gw **FP1**	RODRIGUEZ-CARVAJAL Juan COLIN Claire	Nuclear structure refinement with FullProf	ILL	a14 a24 **a31** a36 a47
gw **FP2**	*same experts as for gw FP1*	Nuclear and Magnetic structure refinement with FullProf	ILL	**a05** a09 a18 a30 a35
gw **FP3**	*same experts as for gw FP1*	Nuclear structure refinement with FullProf	ILL	a16 a34 a39 **a42** a49
gw **FP4/PDF**	CHECCHIA Stefano FERNANDEZ MARTINEZ Alejandro	Structure refinement with FullProf and/or PDF analysis	ILL	a01 **a04** a10 a45 a51
gw **XRD/PDF**	*same experts as for gw XRD/PDF*	Structure refinement and/or PDF analysis	ILL	a12 a23 a25 a38 **a43**
gw **TOMO**	CHECCHIA Stefano	Tomography data analysis	ILL	a11 a26 a27 **a29** a53
gw **EXAFS1**	D'ACAPITO Francesco	EXAFS data treatment	ESRF	**a13** a19 a48 a54
gw **EXAFS2**	*same experts as for gw EXAFS1*	EXAFS data treatment	ESRF	a06 a08 **a44** a52
gw **microXRF/XRD**	VERONESI Giulia	microXRF/XRD data treatment	ESRF	a02 **a17** a50
gw **MSCOPY**	RODRIGUEZ LAMAS Raquel GARRIGA Julia	Microscopy data analysis	ESRF	**a15** a28 **a55** a56
gw **SANS/SAXS**	MORFIN Isabelle	Small Angle Scattering data treatment	ESRF	a03 a20 a32 **a40**

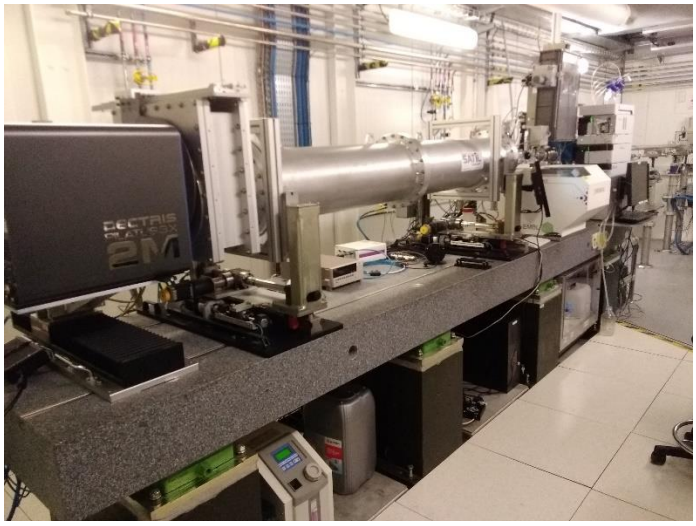
Meeting points: **Hall of ILL4 building** for the group works taking place at ILL
Hall of ESRF central building for the Vlab and the group works taking place at ESRF



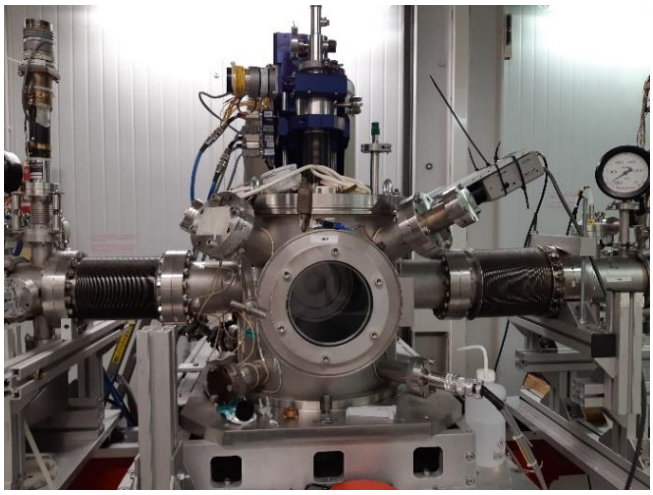
Map of the CNRS site (for XPD and Reflecto labs)

To reach the hall of the F building, enter in the A building, take the stairs on the left of the welcome desk, then walk through the long corridor to the left direction, until you reach the F building. You will see a sign posting from there to the F221 and F217 rooms.

Small Angle Neutron Scattering, D11 _at_ ILL



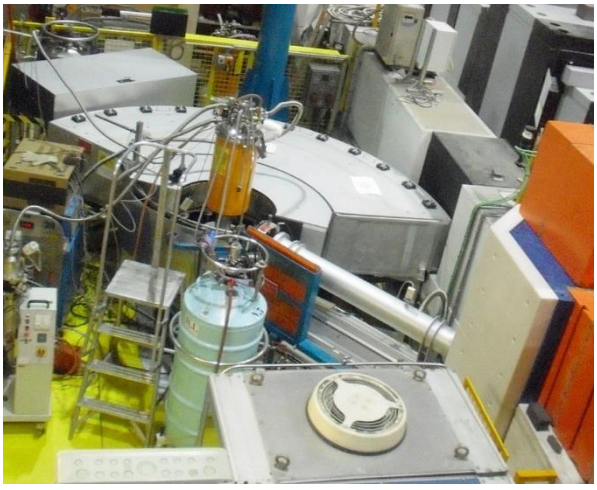
Small angle X-ray scattering, BM29 _at_ ESRF



Extended X-ray Absorption Fine Structure, BM08 @ ESRF

Time Of Flight neutron spectrometry, IN5 @ ILL

EBS storage ring @ ESRF



Powder Neutron Diffraction, D1B @ ILL

PROGRAMME of GRENOBLE

SCHEDULE FOR SESSION B

Last update 24/02/2023

Common lectures

Session B lectures

Other

@ILL: **ILL4 Building (ZAC)**, Ground floor, Chadwick Amphitheatre

@ILL(2): **ILL4 Building (ZAC)**, 1st floor, Isabelle Grillo Seminar Room

@ESRF: **ESRF central Building,** Basement, ESRF Auditorium

@CIBB: **CIBB Building**, 2nd floor, Seminar Room (room 214)

@online: online lecture with zoom

WEEK 1: 27TH FEBRUARY – 3RD MARCH

	Monday 27	*Tuesday 28*	*Wednesday 1*	*Thursday 2*	*Friday 3*
8:40 – 9:25 10' break **9:35 – 10:20**	**8:30 – 10:30** **ESRF / ILL badges distribution**	@ILL Introduction to interactions of X-rays and neutrons with matter (2/2) *Andrew Harrison*	@ILL Neutrons: scattering and instrumentation (2/2) *Andrew Wildes*	@ILL Introduction to X-ray Spectroscopies *Sakura Pascarelli*	@ILL From a diffraction experiment to the crystal structure *Marc de Boissieu* @ILL Training on crystallography (1/2) *Claire Colin & Béatrice Grenier*
10:50 – 11:35 10' break **11:45 – 12:30**	@ILL **10:30 – 11:00** **Welcome** @ILL **11:00 – 12:40** Introduction to the science at large scale facilities: neutron, synchrotron and XFEL sources *Marc de Boissieu*	@ILL Neutrons: scattering and instrumentation (1/2) *Andrew Wildes*	@ILL Refresher lecture on crystallography (1/2) *Béatrice Grenier*	@ILL Refresher lecture on crystallography (2/2) *Béatrice Grenier*	@ILL Fundamentals of X-ray Absorption Fine Structure Spectroscopy *Sakura Pascarelli*
14:00 – 14:45 10' break **14:55 – 15:40**	@ILL Introduction to interactions of X-rays and neutrons with matter (1/2) *Andrew Harrison*	@ILL Introduction to synchrotron radiation, coherence and the evolution to free electron lasing *David Attwood*	**ILL / ESRF visit**	**ILL / ESRF visit**	@ILL XFELs and ultrafast applications *Sakura Pascarelli*
16:10 – 16:55 10' break **17:05 – 17:50**	@ILL **ESRF & ILL presentations (45' each)** **UGA presentation (10')**	@ILL Basic of X-ray detectors: How do they work and how are they characterised? *Heinz Graafsma*	@ILL X-ray optics and applications *David Attwood*	@ILL Training on basics about neutron and X-ray radiations (1/2)	@ILL **Questions on lectures** *(with lecturers of the week)*
	18:15 **Welcome cocktail**				**19:30 Gala dinner**

SCHEDULE FOR SESSION B

WEEK 2: 6TH – 10TH MARCH

	Monday 6	Tuesday 7	Wednesday 8	Thursday 9	Friday 10
8:40 – 9:25 10' break **9:35 – 10:20**	@ILL Introduction to small angle scattering *Martin Müller*	**9:00 – 12:30** ***ESRF PRACTICALS*** *(in small groups)*	**9:00 – 12:30** ***ESRF PRACTICALS*** *(in small groups)*	@ILL Data science: from big & open data to cloud computing *Vincent Favre-Nicolin*	@ILL Introduction to neutron and X-ray inelastic scattering *Victor Balédent*
10:50 – 11:35 10' break **11:45 – 12:30**	**@online @ILL** Introduction to imaging techniques *Federica Marone*			@ILL Serial (femtosecond) crystallography *Thomas Barends*	@ILL Full-field coherent Imaging *Peter Cloetens*
14:00 – 14:45 10' break **14:55 – 15:40**	@ILL(2) Protein crystallography: data collection and reduction, phasing *Marc Roe*	**14:00 – 17:30** ***ESRF PRACTICALS*** *(in small groups)*	**14:00 – 17:30** ***ESRF PRACTICALS*** *(in small groups)*	**14:00 – 17:45** **POSTER SESSION**	@ILL **Questions on lectures** *(with lecturers of the week)*
16:10 – 16:55 10' break **17:05 – 17:50**	@ILL(2) Electron microscopy for structural biology *Allison Ballandras-Colas*			**17:45 Poster awards**	@ILL Training on crystallography (2/2) *Claire Colin & Béatrice Grenier*

SCHEDULE FOR SESSION B

WEEK 3: 13TH –17TH MARCH

	Monday 13	Tuesday 14	Wednesday 15	Thursday 16	Friday 17
8:40 – 9:25 10' break **9:35 – 10:20**	@ILL Hard X-ray optics for SR beamlines *Ray Barrett*	**9:00 – 12:30** ***ILL PRACTICALS*** *(in small groups)*	@CIBB Solution X-ray Scattering from Biological Macromolecules *Mirjam Czjzek*	@ILL(2) Non-crystallographic ways of obtaining structural and dynamical information at different length and time scales for biological systems *Peter Judge*	@CIBB Crystallization of biological macromolecules: Theoretical and practical aspects of crystallization in solution *Monika Spano*
10:50 – 11:35 10' break **11:45 – 12:30**	@ILL(2) Neutron macromolecular crystallography *Matthew Blakeley*		@online @CIBB Fibre diffraction *Craig Boote*	@ILL VLab: how to do your own ultrafast x-ray experiment *Christian Bressler*	@CIBB Super-resolution microscopy: a revolution in biological imaging *Dominique Bourgeois*
14:00 – 14:45 10' break **14:55 – 15:40**	@ESRF Science at neutron spallation sources: exploiting accelerator based facilities *Sean Langridge*	**14:00 – 17:30** ***ILL PRACTICALS*** *(in small groups)*	@CIBB Biological small angle neutron scattering *Frank Gabel*	@CIBB Towards integrated structural biology: studying macromolecular complexes by native mass spectrometry *Elisabetta Boeri Erba*	**14:00 – 17:30** ***GROUP WORK:*** ***Treat your own data*** *OR* ***VLab: do your own ultrafast x-ray experiment*** *(in small groups)*
16:10 – 16:55 10' break **17:05 – 17:50**	**16:10 – 17:10** @online @ESRF Ancient materials research with synchrotron and neutron techniques *Sebastian Schoeder* **@ESRF 17:20** DECTRIS presentation *Dubravka Sisak Jung* **@ESRF 17:50** NFFA-EUROPE-PILOT presentation *Anthony Leonard*		@CIBB Nuclear Magnetic Resonance *Martin Blackledge*	@CIBB Training on basics about neutron and X-ray radiations (2/2, session B)	

SCHEDULE FOR SESSION B

WEEK 4: 20TH – 24TH MARCH: 'OUTSIDE' GRENOBLE

WEEK 5: 27TH – 31ST MARCH

	Monday 27	Tuesday 28	Wednesday 29	Thursday 30	Friday 31
8:40 – 9:25 10' break **9:35 – 10:20**	@CIBB Protein Dynamics by Neutron Scattering and Dynamics of Macromolecules *Giuseppe Zaccai*	@CIBB Biomedical imaging with synchrotron radiation *Giuliana Tromba*	**8:40 – 9:40** @CIBB Introduction to current trends and challenges of molecular and structural biology *Claude Sauter*	@CIBB X-ray spectroscopy *Sergio Jannuzzi*	**9:20 – 10:20** @CIBB Deuteration for biological research *Trevor Forsyth*
10:50 – 11:35 10' break **11:45 – 12:30**	@CIBB Crystallography of viruses and very large macromolecules *David Stuart*	@CIBB Coherent diffraction imaging and ptychography for soft condensed matter and biology *Chris Jacobsen*	**10:10 – 11:10** @CIBB Following protein structural changes as they happen with time resolved X-ray techniques *Giorgio Schirò* @CIBB **11:30 – 13:00** Radiation damage in protein crystallography *Martin Weik*	@CIBB Membrane diffraction *Dave Barlow*	@CIBB Integrative biology *Annalisa Pastore*
14:00 – 14:45 10' break **14:55 – 15:40**	**14:00 – 17:30** **TUTORIALS / LABS** (in small groups)	@CIBB X-ray and neutron reflectometry in biophysics *Yuri Gerelli*	**14:00 – 17:30** **TUTORIALS / LABS** (in small groups)	**14:00 – 17:30** **TUTORIALS / LABS** (in small groups)	@CIBB Analysis and visualization of 3D imaging data *Chris Buckley*
16:10 – 16:55 10' break **17:05 – 17:50**		@CIBB **"How to write a good proposal"** (session B)			**16:10 – 17:10** @ESRF Hercules Mythology *Chris Buckley* **17:20 – 18:20** @ESRF **EVALUATION MEETING** **18:30 Farewell wine and cheese**

PRACTICALS / LABS / TUTORIALS FOR SESSION B

Full-time participants only

Coordinators: Allison BALLANDRAS-COLAS, Béatrice GRENIER, Didier NURIZZO, Petra PERNOT, Giorgio SCHIRO

Contacts:		
@ILL	Béatrice GRENIER (grenier_at_ill.fr)	+33 (0)4 76 20 74 23
	Lucile MANGIN-THRO	+33 (0)4 76 20 75 71
@ESRF	Fabrice WILHELM	+33 (0)4 76 88 24 19
	Petra PERNOT	+33 (0)4 76 88 28 42
@IBS	Giorgio SCHIRO (schiro_at_ibs.fr)	+33 (0)4 57 42 86 94
@CIBB	Allison BALLANDRAS-COLAS	+33 (0)4 57 42 86 86

Part-time participants will not participate at all in week 4 and in practicals/labs/tutorials* organised by Grenoble. So, this section concerns only the **full-time participants**.

During the weeks 2, 3, and 5, organised by Grenoble, all full-time participants will carry out two practicals at Institut Laue Langevin (ILL) and four practicals at European Synchrotron Radiation Facility (ESRF), delivered mostly by instrument responsibles and beamline scientists. In addition, they will participate in labs at IBS and in tutorials, taught by staff / users of large-scale facilities essentially (three tutorials / labs in total). Last, a few participants will follow a tutorial on Vlab while all the others will work in small groups on data from one or two person(s) of the group (group work).

All full-time participants will follow additional practicals / tutorials during week 4, spent at one of the following partner facilities: ALBA, DESY / European XFEL, Elettra / FERMI, or SLS / SINQ (PSI). Among these four groups, the participants have been distributed in groups of 3, 4, or 5 at the various sites (B1 and B2 at ALBA, only one B group at the three other partner sites). See the PROGRAMME OF PARTNER Section for the detailed programme there.

As concerns practicals / labs / tutorials in the programme of Grenoble, no fixed groups were made, but rather an individual and personalised schedule. Therefore, we assigned a number to each participant, for a better readability in the tables that will follow (b01 to b24). All the information regarding groups B, B1, or B2, and the numbering b01, b02, … can be found in the PRACTICAL INFORMATION section of this booklet (pages 18 – 19).

The complete practicals / labs / tutorials schedule was done in the best possible way (regarding the many constraints) with respect to the main research interests and wishes expressed. Each full-time participant will perform selected practicals and tutorials (and labs for most of them), as indicated in the following.

The list of all practicals / labs / tutorials (titles and instructors) in Grenoble is given in the following pages, together with the participants assignment, using the reference numbers b01, b02, … The complete individual schedule for all participants can also be found on a separate PDF document.

The summaries of the practicals / labs / tutorials are available in MY SCHEDULE on the Hercules website: https://hercules-school.eu/my-dashboard (once connected).

All full-time participants are required to attend the entire practical / lab / tutorial programme assigned to them

** **Practical**: hands-on training on large scale facility instruments ; **Lab**: hands-on training on laboratory experiments ; **Tutorial**: data treatment (on synchrotron or neutron data recorded beforehand) or, for a few of them, simulations.*

Practicals at ESRF

Meeting point on the mezzanine of ESRF central building 15 min. earlier
(except for EM → see footnote)

7th and 8th MARCH, 9:00 – 12:30 and 14:00 – 17:30

			7th March		8th March	
BEAMLINE	INSTRUCTOR(S)	TITLE	9:00	14:00	9:00	14:00
BM05	BOLLER Elodie, COOK Phil, DOLLMAN Kathleen	Synchrotron-based microtomography			b09 b14 b18 b20 b23	
BM07	ENGILBERGE Sylvain, RIVE-MATHIEU Eric, ROYANT Antoine	Protein crystallography on BM07-FIP2	b05 b16 b23 b22	b02 b12 b19 b20		
BM26	ROSENTHAL Martin	Synchrotron based Small and Wide angle X-ray scattering for in-situ experimentation	b02 b10 b12 b20 23			
BM29	HUTIN Stéphanie, MOUSSAOUI Dihia, PERNOT Petra, TULLY Mark	Macromolecule Small Angle Scattering with X-rays (BioSAXS)		b01 b07 b14 b16 b23	b02 b06 b12 b13 b15	b03 b08 b10 b18 b20
BM30	PROUX Olivier, ROVEZZI Mauro, TESTEMALE Denis	X-ray absorption spectroscopy		b04 b06 b08 b13 b21		
CM01	GRINZATO Alessandro, KANDIAH Eaazhisai	Sample preparation and data collection for high resolution cryo electron microscopy			b01 b05 b08 b21 b24	b04 b07 b09 b15 b17
EM (IBS) *	BALLANDRAS-COLAS Allison, CHENAVIER Florian	Sample preparation and data collection for negative staining electron microscopy	b01 b04 b07 b08 b21	b05 b09 b15 b17 b24		
ID09	LEVANTINO Matteo, MARIETTE Céline	Time-resolved X-ray scattering	a32 a36 a40 a42 b24			
ID13	LIU Jiliang, MELNIKOV Alexey, SZTUCKI Michael	Scanning X-ray Diffraction Microscopy			b03 b04 b07 b16 b17	b01 b11 b19 b22 b24
ID16A	KARPOV Dmitry	Synchrotron-based X-ray nanotomography	b03 b14 b11 b17 b18			
ID23-2	ORLANS Julien, BASU Shibom	MX data collection in the Alphafold age		b03 b10 b11 b18 b22		b02 b05 b12 b21 b23
ID30A-3	MELNIKOV Igor	MX data collection in the Alphafold age	b06 b09 b13 b15 b19			
The icOS Lab	ENGILBERGE Sylvain, ROYANT Antoine	In crystallo optical spectroscopy at the icOS Lab			b10 b11 b19 b22	b06 b13 b14 b16

***EM (IBS)** is a lab that will take place at IBS, thus the meeting point is in the hall of IBS.

NB: On 7th March morning, the ESRF practical on **ID09** will address to participants from both the A and B sessions.

Practicals at ILL

Meeting point in the hall of ILL4 building 10 min. earlier

NEUTRONS FOR SOCIETY

14th MARCH, 9:00 – 12:30 and 14:00 – 17:30

INSTRUMENT	INSTRUCTOR(S)	TITLE	14th March 9:00	14th March 14:00
D22	PREVOST Sylvain	Small angle neutron scattering: acquisition, reduction and analysis for self-assemblies and biomacromolecules	b03 b12 b14 b18 b24	b01 b02 b04 b08 b10
FIGARO	GUTFREUND Philipp	Neutron reflectometry for thin film investigations	b04 b08 b11 b20 b22	b05 b07 b17 b19 b23
IN15	HOFFMANN Ingo	Basics of Neutron Spin Echo (NSE)	b13 b23 b09 b16	b11 b14 b21 b22
IN16B	PETERS Judith	Molecular dynamics probed by neutron spectroscopy	b02 b10 b17 b19 b21	b03 b06 b13 b15 b20
LADI	GAJDOS Lukas	Neutron macromolecular crystallography	b01 b05 b06 b07 b15	b09 b12 b16 b18 b24

Additional information about the ESRF and ILL practicals:

You will be contacted by your instructor in case you should bring your laptop and install some particular software beforehand. Also check this information in MY SCHEDULE on the Hercules website.

You can find information on the various **ESRF beamlines** and **ILL instruments** at the following URLs:
https://www.ill.eu/users/instruments/instruments-list
https://www.esrf.fr/home/UsersAndScience/find-a-beamline.html

Additional information about the labs and tutorials:

For some tutorials, you will need to **install specific software beforehand**, to be able to do the data treatment. In that case, your instructor will send you an email before the tutorial and/or will give this information in the summary of the tutorial on the Hercules website. **If you have no computer or do not have the required OS system** for a particular tutorial, you may either share a laptop with another participant or borrow a PC Windows laptop, assuming there is still one available (send an email to grenier_at_ill.fr).

Meeting points: **Hall of CIBB building** for the labs/tutorials taking place at CIBB
Hall of IBS building for the labs/tutorials taking place at IBS

Tutorials and Labs

Meeting points: see previous page

27th, 29th, and 30th MARCH, 14:00 – 17:30

TUTORIAL / LAB		INSTRUCTOR(S)	TITLE	LOCATION	27th March	29th March	30th March
tutorial	**BioSAXS**	THUREAU Aurélien	First steps in BioSAXS data processing and analysis	CIBB		b01 b09 b10 b17 b18 b24	b02 b03 b04 b20 b21 b23
tutorial	**COOT**	DE ZITTER Elke	Macromolecular model building and analysis in electron density maps using COOT	IBS	b08 b12 b15 b20	b03 b13 b22 b23	b05 b11 b19
lab	**CRYST**	SPANO Monika	Bio-macromolecular crystallization	IBS		b02 b06 b11 b12	b01 b08 b09 b24
lab	**Mass Spec**	BOERI ERBA Elisabetta, KISS Agneta	Mass spectrometry to study biomolecules	IBS		b04 b05 b07 b16 b19	b12 b15 b22
lab	**NMR**	FAVIER Adrien, VALLET Alicia	Protein-Protein interaction binding site determination by NMR chemical shift mapping	IBS	b01 b05 b06 b11 b16	b08 b14 b15 b20 b21	
tutorial	**NSE**	PLAZANET Marie	Investigating diffusion in complex liquids by neutron spin echo	CIBB	b02 b09 b10 b13 b22 b24		
lab	**SMLM**	GLUSHONKOV Oleksandr, WULFFELE Jip	Introduction to Single-Molecule Localization Microscopy (SMLM)	IBS	b04 b17 b19 b21		b07 b14 b16 b18
tutorial	**Mol Dyn**	NIDRICHE Agathe, PETERS Judith	Molecular dynamics probed by neutron spectroscopy	CIBB			b06 b10 b13 b17
tutorial	**Tomo CDI**	ZONTONE Federico	Tomographic Coherent X-ray Diffraction Imaging in practice	CIBB	b03 b07 b14 b18 b23		

See additional information on the previous page.

Vlab tutorial or group work

17th MARCH, 14:00 – 17:30

Meeting points: see below tables

Each full-time participant will either participate in a group work or follow the Vlab tutorial.

VLAB TUTORIAL

Some participants from the A session will join for this tutorial.

TUTORIAL	INSTRUCTOR	TITLE	LOCATION	PARTICIPANTS
Vlab	BRESSLER Christian	VLab: do your own ultrafast X-ray experiment	ESRF	a07 a21 a22 a33 a37 a41 a46 b03 b13 b16

GROUP WORK

During the group work session, the participants bringing their data will be asked to prepare the group work session and animate it. Their reference number is enlightened in bold purple. Experts from this field will also be present to explain some data treatment and/or try to answer questions about your data analysis.

GROUP WORK	EXPERT(S)	TITLE	LOCATION	PARTICIPANTS
gw **SAXS**	SZTUCKI Michael	Small Angle X-ray Scattering data treatment	CIBB	**b02** b06 b10 **b21** b24
gw **TOMO**	ECKERMANN Marina PALEO Pierre	Tomography data analysis	CIBB	**b01** **b04** b14 b18
gw **Xtallo**	FOOS Nicolas NURIZZO Didier	Protein crystallographic structure refinement	CIBB	b05 **b07** b08 b12 b15
gw **Reflecto**	PARACINI Nicolo	Reflectometry data analysis	CIBB	b09 b20 **b22** b23
gw **XRF**	VERONESI Giulia	X-ray Fluorescence data analysis	ESRF	**b11** b17 **b19**

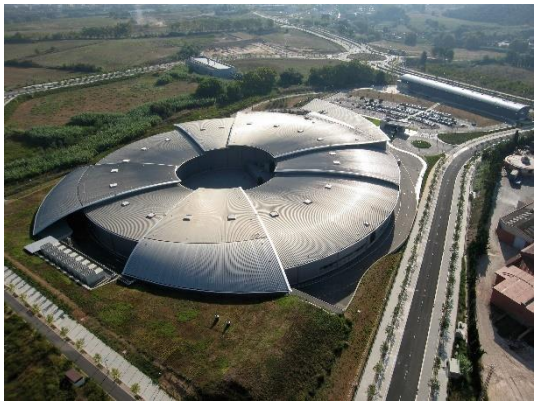
Meeting points: **Hall of CIBB building** for the group works taking place at CIBB
Hall of ESRF central building for the Vlab and the group work taking place at ESRF

PROGRAMME of PARTNERS

DESY (Hamburg, Germany)

European XFEL (Hamburg, Germany)

Elettra / FERMI (Trieste, Italy)



ALBA (Barcelona, Spain)

SLS and SINQ _at_ PSI (Villigen, Switzerland)

ALBA

GENERAL PLANNING for 20 – 24 MARCH

Arrival at the hotel on Sunday 19 March evening and departure on Sunday 26 March.

All practical information concerning travel and accommodation will be provided separately.

Monday 20 March

TIME	TITLE	SPEAKER	ROOM
9:00	Welcome	-	Maxwell Auditorium
9:15	Welcome message	Caterina Biscari	
9:45	Serial Synchrotron Crystallography in MX beamlines at ALBA	Xavier Carpena	
10:15	Full Field Soft X-ray transmission microscopy	Andrea Sorrentino	
10:45	FaXToR: The new fast tomography beamline at the ALBA synchrotron	Federico Cova	
11:15	*COFFEE BREAK*		
11:45	Soft x-ray absorption and x-ray magnetic circular dichroism	Javier Herrero	Maxwell Auditorium
12:15	Photo Emission Electron Microscopy (PEEM) and Low Energy Electron Microscopy (LEEM)	Miguel Ángel Niño	
13:00	*LUNCH*		
15:00	Ambient Pressure XPS: Technique and Applications	Virginia Pérez Dieste	Maxwell Auditorium
15:30	The electrochemical NAP-XPS	Juan J. Velasco	
16:00	LOREA: the ARPES beamline at ALBA, from UV to Soft X-ray	Massimo Tallarida	
16:30	InCAEM: infrastructure for correlative analysis of advanced energy materials	Lucia Aballe	
17:00	*COFFEE BREAK*		
17:30	Guided Tour to ALBA and microscopy platform		

Tuesday 21 March and Wednesday 22 March

TIME	TITLE	WHERE
9:00 – 13:00	Practicals	ALBA beamlines
	LUNCH	
14:30 – 18:00	Practicals	ALBA beamlines

ALBA

Thursday 23 March

SESSION A:

TIME	TITLE	ROOM
9:00	Tutorial: Analysis of data collected at beamlines	Marie Curie or Niels Bohr
11:30	Preparation of an experimental report	
13:00	*LUNCH*	
14:30	Tutorial: Analysis of data collected at beamlines	Marie Curie or Niels Bohr
17:00	Preparation of an experimental report	

More details on next page for the specific schedule of groups A1, A2, A3

SESSION B:

TIME	TITLE	INSTRUCTORS	ROOM
9:00	Tutorial: Macromolecular model building and analysis of electron density maps.	Damia Garriga Roeland Boer	Tesla training room
11:30	Preparation of an experimental report		
13:00	*LUNCH*		
14:30	Tutorial: Infrared data handling (chemical imaging and statistical analysis)	Martin Kreuzer	Tesla training room
17:00	Preparation of an experimental report.		

Groups B1 and B2 are together for the entire day

ALL:

20:00	**Social dinner**

Friday 24 March

TIME	TITLE	ROOM
9:00	Preparation of an experimental report: Final touches	Marie Curie Niels/Bohr/Bragg
10:00 10:20 10:40	**Presentation of the reports:** Group **A1** → NOTOS+BOREAS exp. Group **A2** → BOREAS+NCD exp. Group **A3** → NCD+NOTOS exp.	Maxwell Auditorium
11:00	*COFFEE BREAK*	
11:20 11:40	**Presentation of the reports:** Group **B1** → XALOC+MIRAS exp. Group **B2** → XALOC+MIRAS exp.	Maxwell Auditorium
12:00	**Wrap-up session**	Maxwell Auditorium
13:00	*LUNCH*	
15:00	One to One meetings with ALBA staff	Beamlines

Please refer to pages 17 – 19 for the nominative list of groups A1, A2, A3, B1, and B2.

ALBA

PRACTICALS AT ALBA, 21 – 22 March

SESSION A:

BEAMLINE	TITLE	INSTRUCTORS	21 March all day	22 March all day
BL 11	**Practical at NCD-SWEET:** Structural changes of polycaprolactone in function of temperature: SAXS/WAXS experiment.	Marc Malfois, Cristian Huck	A3	A2
BL 16	**Practical at NOTOS:** XAS & XRD operando studies on batteries at the NOTOS beamline	Carlos Escudero Ilaria Lucentini Ashley Black Jordi Prat	A1	A3
BL 29	**Practical at BOREAS:** XAS and XMCD investigation of bulk and surface science samples	Javier Herrero Pierluigi Gargiani Manuel Valvidares	A2	A1

SESSION B:

			21 March		22 March	
BEAMLINE	TITLE	INSTRUCTORS	9:00	14:30	9:00	14:30
BL 01	**Practical at MIRAS**: Data collection using the synchrotron-based FTIR microscope at MIRAS BL	Tanja Ducic Ibraheem Yousef	B1		B2	
BL 09	**Practical at MISTRAL**: Sample preparation, data collection and applications for cryo soft X-ray tomography	Ana J. Pérez-Berná		B1		B2
BL 13	**Practical at XALOC**: Macromolecular crystallography hands-on training at XALOC beamline	Xavier Carpena Isidro Crespo Fernando Gil Roeland Boer	B2		B1	

TUTORIALS AT ALBA, 23 March, SESSION A

			23 March	
ROOM	TITLE	INSTRUCTORS	9:00	14:30
Niels Bohr	**Analysis of data collected at NCD-SWEET**: data reduction using pyFAI and DAWN software. Preliminary data analysis and interpretation.	Marc Malfois, Cristian Huck	A3	A2
Marie Curie	**Analysis of XAS data collected at NOTOS**: XANES linear combination approach (Athena program), XES data treatment: quantification of the local magnetic moment by the IAD method (Origin program) (**Group 1A+3A**)	Laura Simonelli Carlo Marini		A1+A3
Marie Curie	**Analysis of data collected at BOREAS**: Analysis of XAS and XMCD data: spectra treatment, sum rules and introduction to multiplet simulations	Javier Herrero Martin Pierluigi Gargiani Manuel Valvidares	A1+A2	

DESY / European XFEL

GENERAL PLANNING for 20 – 24 MARCH

Arrival at the DESY guesthouse on Sunday 19 March evening and departure on Saturday 25 March.

All practical information concerning travel and accommodation will be provided separately.

Monday 20 March

ALL GROUPS:

TIME	TITLE	WHO	WHERE
8:30	Bus pickup from DESY		
8:30 – 9:15	Transportation to EuXFEL headquarters building (XHQ)		
9:15 – 9:30	Welcome to HERCULES 2023	O. Seeck, C. Bressler	XHQ/E1.173
9:30 – 9:45	Welcome to EuXFEL	EuXFEL director	XHQ/E1.173
9:45 – 10:30	Tutorial: What is a SASE X-Ray Free Electron Laser? Part I	Gianluca Geloni	XHQ/E1.173
10:30 – 11:00	COFFEE BREAK, GROUP PHOTO		XHQ Foyer
11:00 – 12:30	Tutorial: What is a SASE X-Ray Free Electron Laser? Part II	Gianluca Geloni	XHQ/E1.173
12:30 – 14:00	LUNCH BREAK		BeamStop
14:00 – 15:30	Tour of Experimental Hall (including COFFEE BREAK)	Tour guides	XHQ Foyer

GROUPS A1, A2, A3, B:

TIME	TITLE
15:30 – 17:30	Practicals / Tutorials I at EuXFEL *Meeting point at XHQ Foyer*
ca 18:00	Bus to DESY

GROUP A4:

TIME	TITLE
15:30 – 16:00	Bus to DESY
16:00 – 18:00	Practicals / Tutorials I at EuXFEL *Meeting point at BKR/DESY*

Tuesday 21 March

TIME	TITLE	WHERE
8:30 – 9:00	Transportation from DESY to EuXFEL (A1, A3, B) Stay at DESY (A2, A4)	
9:00 – 10:30	Practicals / Tutorials II at European XFEL	
10:30 – 11:00	COFFEE BREAK	EuXFEL: XHQ Foyer DESY: 200/24
11:00 – 12:30	Practicals / Tutorials III at European XFEL	
12:30 – 14:00	LUNCH BREAK	EuXFEL: Beamstop DESY canteen
14:00 – 15:30	Practicals / Tutorials IV at European XFEL	
	COFFEE BREAK	EuXFEL: XHQ Foyer DESY: 200/24
15:30 – 17:30	Practicals / Tutorials V at European XFEL	
ca 18:00	Bus to DESY (A1, A3, B)	

DESY / European XFEL

Wednesday 23 and Thursday 24 March

9:00 – 18:00	Practicals / Tutorials at DESY beamlines

Friday 25 March

9:00 – 18:00	Talks preparation and presentation

You are requested to bring your own laptop or indicate whether you need a EuXFEL laptop before coming to Hamburg. WIFI connection and password will be provided at EuXFEL.

Please refer to pages 17 – 19 for the nominative list of groups A1, A2, A3, A4, and B.

PRACTICALS AT EUROPEAN XFEL, 20 – 21 March

Type	Meeting point	Title	Duration	Instructors	Group
Practical I	XHQ Foyer	**SXP Laser Work**	2h	Manuel Izquierdo Patrik Grychtol	A1
Practical II, III		**Scripting for Beamline Control: Beam Position Feedback**	3h	Steffen Hauf	
Practical IV, V		**Laser Practical and Beam Position Feedback**	3h	Manuel Izquierdo	
		XFEL Diagnostics: Intensity, Spectrum and Time Structure		Naresh Kujala Jan Grünert	A2
Tutorial I	XHQ Foyer	1/ Intro XPD/HED	2h		
Tutorial II	BKR/DESY	2/ Introduction to hard x-ray spectral monitoring	1h30		
Practical III, IV		3/ SASE spectrum - experiment	3h		
Tutorial V		4/ SASE spectrum – data analysis	1h30		
	XHQ Foyer	**XFEL beam propagation and focusing**			A3
Practical / Tutorial I		1/ Intro to photon beam transport, diagnostics and HED instrument	2h	Ulf Zastrau Lisa Randolph	
Practical II – V		2/ Alignment of the x-ray beam path, divergence, and focusing of x-rays	6h	Ulf Zastrau	
	BKR/DESY	**EuXFEL Machine and Undulator Studies:**		Shan Liu Marc Guetg Gianluca Geloni	A4
Tutorial / Practical I		1/ Longitudinal Phase Space	2h		
Tutorial II		2/ Introduction into tuning	1h30		
Tutorial III		3/ Tuning using Ocelot optimizer	1h30		
Tutorial IV, V		4/ Pointing study	1h30		
Tutorial IV, V		5/ Phase shifter scans	1h30		

DESY / European XFEL

Type	Meeting point	Title	Duration	Instructors	Group
Tutorial I	XHQ Foyer	**Vlab:** how to do your own XFEL experiment	2h	Christian Bressler	B
Tutorial II		**Introduction to serial femtosecond crystallography and data analysis at EuXFEL**	1h30	Fabio Dall'Antonia Oleksii Turkot Luca Gelisio	
Tutorial III – IV		**Hands-on** serial femtosecond crystallography data analysis	3h		
Tutorial V		**Vlab:** perform your own XFEL experiment	1h30	Christian Bressler	

All participants (from the A and B sessions) will meet their tutors either at the XHQ Foyer or at BKR/DESY, then the tutors will guide them to the appropriate location (room or beamline) and explain how this will continue over day.

PRACTICALS AT DESY – PETRA III, 22 – 23 March

Type	Beamline	Title	Instructors	Group (and #)
Practical	P02.1	**Powder Diffraction: Batteries**	M. Etter	A1 a25
Practical	P03-nano	**Nano-diffraction: Strain and stress**	Ch. Krywka	A2 a27
Practical	P22	**HAXPES: Electronic states near surfaces**	Ch. Schlueter	A4 a01 a52

NB: the participants from the A3 group are distributed on the three different DESY – PETRA III practicals

Type	Beamline	Title	Instructors	Group
Practical	P12&P13/14	**SAXS & MX: Atomic and molecular structure of biomaterials**	G. Bourenkov C. Blanchet	B

Elettra / FERMI

Elettra Sincrotrone Trieste

GENERAL PLANNING for 20 – 24 MARCH

Arrival at the hotel on Sunday 19 March evening and departure on Sunday 26 March.

All practical information concerning travel and accommodation will be provided separately.

More detailed information can be found at: https://www.elettra.eu/Conferences/2023/HERCULES/

Monday 20 March

TIME	TITLE	WHO
Morning session – *Chair: Matteo Amati – Room: training room*		
09:00	Welcome	
09:10	Frontier Science at FERMI	Filippo Bencivenga
09:45	Basic Principles of ARPES and Spin-ARPES and Their Application in the Investigation of Materials with Strong Spin-orbit Coupling	Ivana Vobornik
10:20	*COFFEE BREAK*	
10:50	Ambient Pressure Soft-x ray absorption spectroscopy: method and application	Piero Torelli
11:25	Near-field approaches for IR spectroscopy and imaging at the nanoscale: theory and examples	Federica Piccirilli
12:00	Xpress – Diffraction at Extreme Conditions	Frederico Alabarse
12:35	*LUNCH BREAK (canteen)*	
Afternoon session		
14:10	Visit to the Fermi experimental hall and control room + Group photo	
15:30	*COFFEE BREAK*	
16:00 – 17:30	Visit to Elettra	

Tuesday 21 March

TIME	TITLE	WHO
Morning session – *Chair: Lara Gigli – Room: training room*		
09:00	Ultrafast phenomena in condensed matter explored through extreme ultraviolet sub-picosecond pulses	Emiliano Principi
09:35	Deep X-Ray Lithography beamline _at_ Elettra: “all you can treat “	Benedetta Marmiroli
10:10	Soft X-ray Microscopy at TwinMic (Elettra)	Alessandra Gianoncelli
10:20	*COFFEE BREAK*	
11:15	Small Angle X-ray Scattering: The answer to dynamics in matter?	Heinz Amenitsch
11:50	Powder diffraction at MCX: From ancient artefacts to future energy storage devices	Jasper Plaisier
12:25	X-ray fluorescence: it’s a wide world!	Ilaria Carlomagno
13:00	*LUNCH BREAK (canteen)*	
14:30 – 17:30	**Practical 1**	

Elettra / FERMI

Elettra Sincrotrone Trieste

Wednesday 22 March

TIME	TITLE
09:30 – 12:30	**Practical 2**
	LUNCH BREAK (canteen)
14:30 – 17:30	**Practical 3**

Thursday 23 March

TIME	TITLE	WHO
Morning session – *Room: training room*		
09:00	Funding opportunities for young researchers	Cecilia Blasetti
09:35	CERIC-ERIC the multi-technique research infrastructure for materials research in Central-Eastern Europe	Dariusz Jan Brzosko
10:10	*COFFEE BREAK*	
Proposal session – *Room: training room*		
10:40	Proposal writing	
13:00	*LUNCH BREAK (canteen)*	
Afternoon session		
14:30 – 17:00	One2One meeting	

Friday 24 March

TIME	TITLE	WHO
Morning session – *Room: training room*		
09:30	Feedback meeting	Matteo Amati Lara Gigli
11:00	*COFFEE BREAK*	
11:30	Closing ceremony	
12:00	*LUNCH BREAK (canteen)*	
Social events		
14:00	Social tour	
19:00 – 22 :30	*SOCIAL DINNER*	

Elettra / FERMI

Elettra Sincrotrone Trieste

PRACTICALS AT ELETTRA / FERMI, 21 – 22 March

SESSION A:

BEAMLINE	TITLE	INSTRUCTORS	21 March 14:30	22 March 9:30	22 March 14:30
TERAFERMI	Terahertz Time Domain Spectroscopy experiment	Paola Di PIETRO Johannes SCHMIDT Andrea PERUCCHI	A1		
NANOSPECTROSCOPY	Imaging and spectroscopy of thin films and 2D materials using SPELEEM	Tevfik Onur MENTES Andrea LOCATELLI		A1	
NANO LAB	Morphomechanical analysis of nanostructured samples with atomic force microscopy	Loredana CASALIS Pietro PARISSE			A1
XPRESS	Extreme conditions & sample preparation: hands on!	Frederico Gil ALABARSE Boby JOSEPH	A2		
DXRL	Fabrication of microfluidic circuits and diffraction gratings through UV lithography and soft-polymer casting	Benedetta MARMIROLI Alessio TURCHET		A2	
ALOISA	XPS and UPS characterization of a ultra-thin organic film	Albano COSSARO Martina Dell'ANGELA			A2
T-REX	Time-Resolved ARPES of quantum materials	Federico CILENTO Wibke BRONSCH	A3		
NANOESCA	Self-assembled molecular layers on metal surfaces: LEED and Auger electron spectroscopy studies.	Vitaliy FEYER Iulia COJOCARIU		A3	
TOMOLAB	Synchrotron- and laboratory-based X-ray computed microtomography	Diego DREOSSI			A3

SESSION B:

BEAMLINE	TITLE	INSTRUCTORS	21 March 14:30	22 March 9:30	22 March 14:30
IUVS	Chemical and structural conformation of biomolecules investigted by UV Resonant Raman	Francesco D'AMICO Barbara ROSSI	B		
SISSI	Infrared multiscale analyses on collagen based materials (from micro to nano)	Federica PICCIRILLI Lisa VACCARI		B	
BIOLAB	Quick journey of a protein: from solution to crystal structure."	Paola STORICI			B

All beamlines in black are at synchrotron Elettra, the two beamlines in blue are at FEL FERMI.

Please refer to pages 17 – 19 for the nominative list of groups A1, A2, A3, and B.

SLS / SINQ (PSI)

PAUL SCHERRER INSTITUT

GENERAL PLANNING for 20 – 24 MARCH

Arrival at the guesthouse on Sunday 19 March evening and departure on Friday 24 March.

All practical information concerning travel and accommodation will be provided separately.

	Monday 20 March	Tuesday 21 March	Wedn. 22 March	Thursday 23 March	Friday 24 March
8:45 – 9:00	Welcome				
9:00 – 09:45	**Lecture 1:** Angle-Resolved Photoelectron Spectroscopy *V. Strocov*	**Lecture 7:** Specialized SINQ *P. Trtik*	**Lecture 9:** Specialized SMUS *Z. Salman*	**SINQ Tutorials**: CAMEA GenX 3 HRPT	**Lecture 11:** Specialized SwissFEL *K. Schnorr*
9:45 – 10:30	**Lecture 2:** Extreme Ultraviolet Lithography *I. Mochi*	**Lecture 8:** Introduction SMUS *H. Luetkens*	**Lecture 10:** Introduction SwissFEL *C. Bostedt*	WBGB/019 WBGB/021 WSLA/108	**Lecture 12:** Proton Therapy *D. Meer*
10:30 – 11:00	*break*	*break*	*break*		*break*
11:00 – 11:45	**Lecture 3:** X-Ray Microscopy *J. Raabe*	**SLS Beamlines Practical #1** Adress Pearl Pollux XIL X-treme	**SLS Beamlines Practical #2** microXAS Phoenix SuperXAS TOMCAT VUV		**Student Talks I:** 3x (10 + 5) min
11:45 – 12:30	**Virtual Tour** SLS				**Student Talks II:** 3x (10 + 5) min
12:30 – 13:30	*lunch at Time Out*			*lunch at Time Out*	*lunch at Time Out*
13:30 – 14:15	**Lecture 4:** Chemical Spectroscopy 1 *O. Safonova, T. Huthwelker, P. Hemberger*			**Tour SwissFEL** *C. Bacellar* arrival 13:45 departure: 14:45	**Student Talks III:** 4x (10 + 5) min
14:15 – 15:00	**Lecture 5:** Chemical Spectroscopy 2 *O. Safonova, T. Huthwelker, P. Hemberger*			**Preparation Student Talks:** start: 15:00 WBGB/019 WBGB/021 WSLA/108 WSLA/127 + time out	Summary, Quiz & Farewell
15:00 – 15:30	*break*				
15:30 – 16:15	**Lecture 6:** Introduction SINQ *J. Embs*				**Departure to Grenoble** ca. 15:30
16:15 – 17:00	**Tour SINQ** *A. Glavic*				
17:30 – 19:00	*dinner at OASE*	*dinner at OASE*	*dinner at OASE*	Farewell dinner: Zur Tenne	
19:00 – 22:00		Thermal bath: Bad Zurzach			

Welcome, Lectures, Students talks, SLS Virtual tour & Summary will take place in WBGB/019

SLS / SINQ (PSI)

PAUL SCHERRER INSTITUT

All the necessary information (schedule, meeting rooms, scripts for practicals and tutorials, etc.) will be posted at the following link: https://indico.psi.ch/e/hercules2023
Password: HcS23_at_5232

PRACTICALS AT PSI – SLS, 21 – 22 March

SESSION A:

BEAMLINE	TITLE	INSTRUCTORS	21 March	22 March
X-Treme	X-ray absorption spectroscopy and X-ray magnetic circular dichroism (soft X-rays)	Jan Dreiser	A1	
Phoenix	Micro X-ray absorption spectroscopy	Camelia Borca, Thomas Huthwelker		A1
XIL	Extreme ultraviolet (EUV) interference lithography	Iacopo Mochi	A2	
microXAS	Two- and Three-Dimensional X-ray micro- XRD and XRF synchrotron imaging	Dario Ferreira Sanchez		A2
PEARL	X-ray photoelectron spectroscopy and diffraction	Matthias Muntwiler	A3	
VUV	Photoelectron photoion coincidence (PEPICO) Spectroscopy of the Allyl Radical C_3H_5	Patrick Hemberger		A3
ADRESS	Soft-X-ray ARPES	Vladimir Strocov	A4	
SuperXAS	X-ray absorption spectroscopy (XAS), quickXAS	Olga Safonova, Adam Clark		A4

SESSION B:

BEAMLINE	TITLE	INSTRUCTORS	21 March	22 March
PolLUX	STXM (scanning transmission spectro-microscopy)	Benjamin Watts	B	
TOMCAT	Absorption and phase contrast X-ray tomographic microscopy	Federica Marone, Christian Schlepütz		B

TUTORIALS AT PSI – SINQ, 23 March

SESSION A:

TUTORIAL	TITLE	INSTRUCTORS	23 March
CAMEA	Inelastic neutron scattering	Amirreza Hemmatzade	a03 a05 a19 a24 a44 a47 a48 a51
GenX 3	Polarized neutron reflectometry	Artur Glavic	a07 a13 a16 a29 a37 a38 a56

SESSION B:

TUTORIAL	TITLE	INSTRUCTORS	23 March
HRPT	Neutron powder diffraction	Denis Cheptiakov	B

Please refer to pages 17 – 19 for the nominative list of groups A1, A2, A3, A4, and B, and of reference numbers a01, a02, …

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