

# HERCULES

## European School

Neutrons and synchrotron radiation for science

Mostly online and partly on site

Last update: 18/03/2022

# 2022

28<sup>th</sup> February  
to 1<sup>st</sup> April

Grenoble  
**FRANCE**

Online for weeks 1, 2, 3, 5 organised by Grenoble

Online for week 4 organised by PSI and KIT

On site for week 4 organised by SOLEIL and DESY / EuXFEL

<https://hercules-school.eu/>



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# ORGANISATION

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**ORGANISED BY:**

Université Grenoble Alpes (UGA)  
Grenoble INP

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**SUPPORTED BY:**

- DECTRIS
- European Synchrotron Radiation Facility (ESRF)
- 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:

<b>SESSION A:</b> Physics and chemistry of condensed matter (48 full-time and 42 part-time* participants).	<b>SESSION B:</b> Biomolecular and soft condensed matter (20 full-time and 4 part-time* participants).
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\* part-time participants attend only online lectures of weeks 1, 2, 3, and 5

It is mainly organised from Grenoble, from the European Schools Office at the “Maison des Magistères” on the Polygone Scientifique Louis Néel, where the Institut Laue Langevin (ILL) and the European Synchrotron Radiation Facility (ESRF) are also located.

**Due to the sanitary context, this 2022 session is mostly organised ONLINE.**

See details on: <https://hercules-school.eu/news>

The HERCULES course includes online lectures, remote practicals, labs, and tutorials, together with virtual visits of large scale facilities and an online poster session.

It also includes **one week of practicals and lectures from different locations outside Grenoble from 20<sup>th</sup> to 25<sup>th</sup> March** (week 4 of the school) for Full time participants only.

**Online course sites: PSI (SLS / SINQ) and KIT**

**On site course sites: DESY + European XFEL and SOLEIL Synchrotron**

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

(see timetables enclosed in the brochure):

- ▶ in the morning from 8:40 to 12:30 with a 30' coffee break at 10:20 (except on the first day when it starts at 9:30).
- ▶ 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. Practical / labs correspond to remote hands-on experiments at large scale facilities ILL and ESRF / in CNRS or IBS laboratories, while tutorials consist mostly in data treatment, without the experimental part.

#### SCHEDULES

The general schedule (lectures, visits, poster session, ...), followed by the list of all practicals / labs / tutorials, is given in this brochure first for the programme organised by Grenoble, then for the programme organised by 1/ PSI (SLS / SINQ) , 2/ KIT, 3/ SOLEIL, and 4/ DESY / European XFEL. The individual schedule of practicals / labs / tutorials, organised both by Grenoble and by one of our four above-mentioned partner facilities, is given in a separate PDF document for all the participants.

All this information can also be found on the Hercules website (see next page).

## PRACTICAL INFORMATION

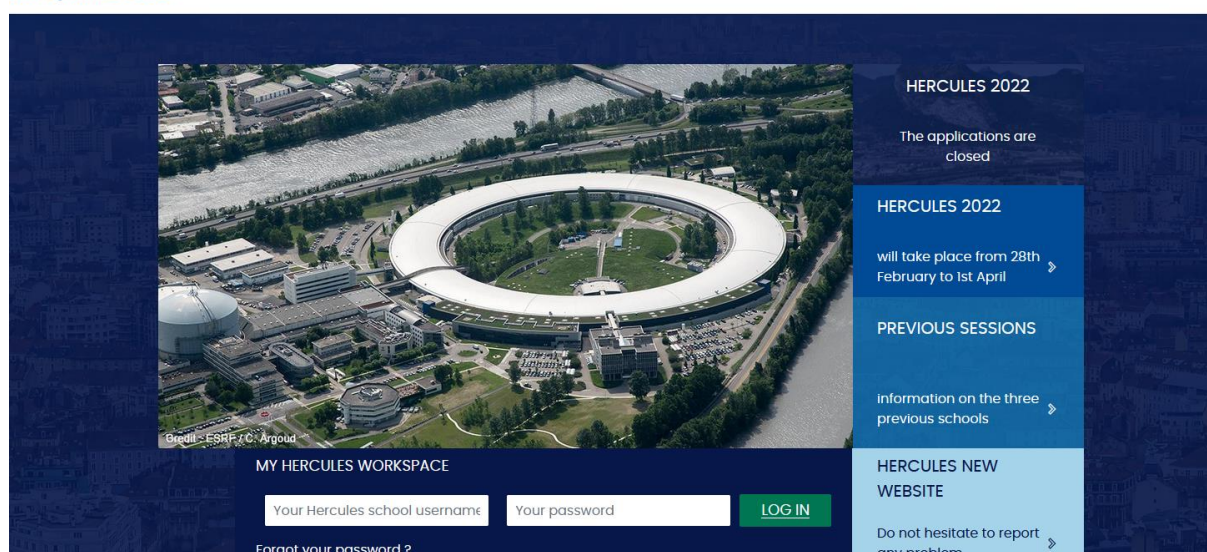
### GENERAL INFORMATION ABOUT THE HERCULES WEBSITE

<https://hercules-school.eu>

Our new website has been developed last year and put online last September. It will thus be used during a Hercules session for the first time this year. So please, **report any problem at [webmaster at hercules-school.eu](mailto:webmaster@hercules-school.eu)**

**HERCULES**  
European School

HOME ABOUT THE SCHOOL ▾ PROGRAMME ▾ APPLICATION & FEES ▾ PRACTICAL INFO ▾ CONTACT  




**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 gallery, ...

To do so, the participants will have to **connect everyday with their login and password**, and then go on their **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” page, from the top to the bottom of the page, followed by some explanations.

Clicking on the icon  at the top of the page allows to see more information on the account (see my account on page 11).



### ► MY PROFILE

The participants can see here the information about their profile on the website and, by clicking on “Change my password / photo”, 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](mailto:hercules@hercules-school.eu).

### INFORMATION

The schedule for the lectures of weeks 1, 2, 3, and 5 is now available (see MY SCHEDULE below).

The partner site for the full-time participants has now been decided (you can see this information in the PORTRAIT GALLERY, where you can apply filters on the partner site). As for the Practicals/Labs/Tutorials organised in Grenoble, the schedule will be available by mid-February.

During the school, all **last minute information** will be posted here.

#### HERCULES NEXTCLOUD


The **global schedule** (PDF file) is available on our cloud, and will be updated regularly (click on the icon above). The **slides and videos of the lectures** will also be deposited there.

**New!** The **Hercules 2022 booklet** is now available on our cloud.

#### MY DOCUMENTS

File	Size
 ui132_test_user132	36.94 KB

#### COMMON DOCUMENTS

Session / Group	File	Size
ALBA group	 t19_test_alba	36.94 KB

### ► INFORMATION

This part will be updated constantly during the school. **All last minute information and usefull 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. to the participants from the A session or from the group traveling to SOLEIL), will be deposited here, and visible only by the concerned participants.

The screenshot displays two main sections: 'MY SCHEDULE' and 'EVALUATION'. The 'MY SCHEDULE' section shows a calendar view for 'today FEB 28 – MAR 6, 2022'. Under 'Monday February 28, 2022', there are five events: 'Welcome' at 09:30 am, 'Introduction to the science at large scale facilities: neutron, synchrotron and XFEL sources' at 10:50 am, 'Introduction to interactions of X-rays and neutrons with matter (1/2)' at 02:00 pm, 'Introduction to Synchrotron Radiation, Coherence, and the Evolution to Free Electron Lasing' at 04:10 pm, and 'Welcome cocktail on Gather town' at 06:00 pm. The 'EVALUATION' section is titled 'FOLLOW-UP OF EVALUATIONS' and shows '0 / 2' evaluations. It lists 'LECTURE 1' and 'LECTURE 2', both dated '15/02/2022', with an 'EVALUATE' button next to each.

### ▶ MY SCHEDULE

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

- Lectures from the common (●), A (●) or B (●) session
- Practicals / labs / tutorials 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, Zoom (or Gather Town) link, summary, ... (see next page).

**Always use this “MY SCHEDULE” tool to find the Zoom link of a lecture, practical, ...**

### ▶ EVALUATION

The participants will have to fill in day-by-day the evaluation for each lecture, practical, ... The date and time and 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 SCHEDULE

< > today FEB 28 – MAR 6, 2022 list

Monday February 28, 2022

09:30 am ● Welcome

10:50 am ● Introduction to the science at large scale facilities: neutron, synchrotron and XFEL

## WELCOME

Marc DE BOISSIEU

## DATE

MON 28/02/2022, 09:30 -&gt; 10:30

[Zoom \(or Gather Town\) link](#)<https://grenoble-inp.zoom.us/j/91303030138>

**After each lecture**, you may click on the title of the next one, then move the mouse over the “Zoom (or Gather Town) link” link to **check whether the Zoom link is the same or not**.

In the first case, simply stay in the meeting, waiting for the start of the next lecture.


In the second case, click on the link to start the new meeting (and thus close the previous one).

## MY TOOLS

[MY ACCOUNT](#)[PORTRAIT GALLERY](#)Contact the school: [hercules@hercules-school.eu](mailto:hercules@hercules-school.eu)Report any problem to [webmaster@hercules-school.eu](mailto:webmaster@hercules-school.eu)

## ▶ MY ACCOUNT

A few additional information is given here, in particular, the session and group of the participant, as well as the reference (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 page as when clicking on the icon 

## ▶ PORTRAIT GALLERY

The photographs of all participants are displayed in this page. The participants can use the search tool to find a given participant or to filter on the A or B session, part-time or full-time participants, SOLEIL 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.

## GENERAL INFORMATION ABOUT CONNECTIONS / LINKS

## SOFTWARES, EVALUATION OF THE COURSE, RECORDING AND PDF PRESENTATIONS OF THE LECTURES, FOR WEEKS 1, 2, 3, AND 5.

▶ **ZOOM and GATHER TOWN will be used during the session.**

Please, **register on these platforms with your Name SURNAME**, so that we can recognize you when you will be logged.

▶ **ZOOM will be used for all lectures, presentations, practicals/labs/tutorials, questions on lectures, and visits.** Please follow the following instructions:

- Keep your microphone OFF during the lectures and open it only when you have a question.
- In order to keep interactivity with the lecturer, please let your camera ON during the lectures (except, of course, if you have internet flow problem). This is even more important for the practicals/labs/tutorials where you are in small groups.
- Most of the lectures will be recorded so please answer "Continue the meeting" when Zoom will notify the recording to you.
- At the end of each lecture, breakout rooms will be created. Assuming you have an up to date Zoom version, you will be able to join the room that you wish, using the "Breakout Rooms" button. You may go to the first room, if you wish to ask questions to the lecturer.

**PLEASE, INSTALL THE 5.9.3 VERSION OF ZOOM OR MORE RECENT.**

▶ **GATHER TOWN** allows to create virtual spaces to bring people together and connect authentically. Gather Town combines video calling with fun features in a custom 2-D world, making it more spontaneous and enjoyable to get together for work or discussion.

**Our Gather Town space will be open during all the session**, permitting you to interact also during the lunch breaks or after lectures.

**You are strongly recommended to use Firefox, Google Chrome, or Chromium**, but not Safari, as the latter web browser sometimes does not work well with Gather Town.

To join the Gather Town HERCULES space, follow this link:

<https://gather.town/xxxxxxxxxx>

**The "Welcome cocktail", poster session, and Wine & Cheese party will be held on Gather Town.**

You are also advised to meet on Gather Town for lunch breaks, at the end of the day, ...

▶ During the session, you are asked to fill in an **EVALUATION FORM** for each lecture and for each practical / lab/ tutorial, on the Hercules web site (<https://hercules-school.eu/>), so please **connect regularly on your dashboard to do it** (see page 10).

▶ **THE RECORDED VIDEOS AND PDF PRESENTATIONS** of the lectures will be available in the "LECTURES week1...", 2, 3, and 5 folders on the **HERCULES cloud** at the following link:

<https://nextcloud.grenoble.cnrs.fr/xxxxxxxxxx>

**PLEASE, RESPECT THE CONFIDENTIALITY OF THESE DOCUMENTS, KEEP THEM ONLY FOR YOUR PERSONAL USE.**

## ZOOM IDS, LINKS, AND PASSWORD, FOR THE LECTURES AND PRACTICALS / LABS / TUTORIALS ORGANISED BY THE GRENOBLE COMMITTEE (WEEKS 1, 2, 3, AND 5).

### LECTURES OF GRENOBLE PROGRAMME

All of them will have the same **PASSWORD: XXXXXXXXX**

**Most of the lecturers** will be using the Zoom meetings created by the organising committee:

- **Common and Session A lectures** (lecturers names in **brown** and **blue**, respectively, in schedules pages 19 – 22 and 31 – 34):

<https://grenoble-inp.zoom.us/xxxxxxxxxx>

The **Welcome** (on the first day), **ILL & ESRF visits**, and **evaluation meeting** (on the last day) will also take place on this meeting.

- **Session B lectures** (lecturers names in **green** in schedule pages 32 – 34):

<https://univ-grenoble-alpes-fr.zoom.us/xxxxxxxxxx>

**Careful! Not all the lecturers will use these links** so always refer to “MY SCHEDULE” on the Hercules website.

### PRACTICALS / LABS / TUTORIALS OF GRENOBLE PROGRAMME

During weeks 2, 3 and 5, a single Zoom meeting will be used for all practicals, labs and tutorials of each session (A and B), still with the **PASSWORD: XXXXXXXXX**

You will then be dispatched in different virtual rooms, corresponding to each practical / lab / tutorial, with your instructor. **Please, log in 10 minutes before the start (8:50 or 13:50) and add the acronym of the practical / lab / tutorial** (as written in the separate individual schedule of practicals / labs / tutorials) **you are to follow before your Name SURNAME in your Zoom ID**, i.e. "ACRONYM Name SURNAME" (example: "FLUO James SMITH"):

- **Practicals / Labs / Tutorials for the A session** (in **yellow** on schedule pages 20 – 22):

<https://ill.zoom.us/xxxxxxxxxx>

- **Practicals / Labs / Tutorials for the B session** (in **yellow** on schedule pages 32 – 34):

<https://esrf.zoom.us/xxxxxxxxxx>

**PRACTICAL INFORMATION ABOUT THE PARTNER SITES (WEEK 4)  
CONTACTS AND ZOOM LINKS (for online) / LOCATION (for on site)**

## ON LINE PARTNERS

### ▶ SLS / SINQ *online*



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#### WEBSITE FOR THE WHOLE WEEK

All the necessary information (zoom links, scripts for practicals and tutorials, schedule, etc.) will be posted at the following link:

<https://indico.psi.ch/e/Hercules2022>

Password: **XXXXXXXX**

### ▶ KIT *online*



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<https://www.kit.edu>

The detailed schedule, with summaries of the practicals, will be accessible on the Hercules website (in MY SCHEDULE, once connected) before the start of the school, but no update will be done there during week 4.

All last minute information / update will be specified by the local organisers.

#### ZOOM LINK FOR THE WHOLE WEEK

<https://kit-lecture.zoom.us/xxxxxxxxxx>

Meeting ID: **XXX XXXX XXXX**

Password = **XXXXXXXX**

## ▶ SOLEIL Synchrotron *on site*



### ■ SOLEIL contacts

<https://www.synchrotron-soleil.fr>

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You will be hosted at:

**Séjour & Affaires Massy Atlantis**, 6 rue Christophe Colomb, 91300 Massy, France,  
and the school will take place at:

**Synchrotron SOLEIL**, L'Orme des Merisiers, 91190 Saint-Aubin, France.

**The local organisers will send you a document containing all practical information** (access map, bus and RER lines, restaurants, ...) **before your travel to SOLEIL.**

## ▶ DESY / European XFEL *on site*



### ■ DESY contact

<https://www.desy.de>

Oliver Seeck	▶ oliver.seeck_at_desy.de
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### ■ EuXFEL contacts

<https://www.xfel.eu>

Kirsten Geist	▶ kirsten.geist_at_xfel.eu
Sakura Pascarelli	▶ sakura.pascarelli_at_xfel.eu
Thomas Tschentscher	▶ thomas.tschentscher_at_xfel.eu

You will be hosted at the DESY guesthouse (DESY hostel) and the school will take place at:

- **European XFEL GmbH**, Holzkoppel 4, 22869 Schenefeld, Germany, and
- **DESY Synchrotron**, Notkestraße 85, 22607 Hamburg, Germany.

The detailed schedule will be accessible on the Hercules website (in MY SCHEDULE, once connected) before the start of the school, but no update will be done there during week 4.

All last minute information / update will be specified by the local organisers.

**The local organisers will send you a document containing all practical information** (access map, bus lines, meeting points and rooms, ...) **before your travel to DESY / European XFEL.**

## LIST OF FULL-TIME PARTICIPANTS:

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

### SESSION A

SURNAME	Name	Site	Group	Subgroup	#
ANCHIETA	Chayene	SOLEIL	A2		a01
ASIMAKOPOULOU	Eleni Myrto	KIT	A		a02
ATLAN	Clément	KIT	A		a03
BOUDJEHEM	Mohamed Redhouane	PSI	A3	W3	a06
BRANTL	Johannes	KIT	A		a07
CHRISTENSEN	Rasmus	SOLEIL	A2		a08
COLALONGO	Mattia	PSI	A1	W1	a09
COZZOLINO	Serena	SOLEIL	A3		a10
DERJ	Anyssa	DESY / EuXFEL	A1		a12
DOLADO FERNANDEZ	Jaime	SOLEIL	A2		a13
DORRI	Samira	KIT	A		a14
ENGLER	Thea	PSI	A1	W3	a15
FITZPATRICK	Maureen	KIT	A		a16
GEERS	Madeleine	PSI	A4	W2	a17
HADDEN	Elhoucine	PSI	A2	W3	a18
HAMID	Mouna	DESY / EuXFEL	A2		a19
HOANG	Le Phuong	PSI	A4	W2	a20
HOLUB	Tamara	SOLEIL	A3		a21
HUMA	Kinza	KIT	A		a22
IGOA SALDAÑA	Fernando	DESY / EuXFEL	A2		a23
IRISH	Austin				a24
JOUSSEAUME	Thibaut	SOLEIL	A1		a25
KRÁL	Petr	PSI	A1	W2	a26
KUZNETSOVA	Anastasiia	PSI	A1	W1	a27
LACMANN	Tom	PSI	A4	W2	a28
LOPES	João	PSI	A2	W1	a29
LØRUP	Erik	DESY / EuXFEL	A3		a30
MOMBRINI	Isabella	PSI	A3	W1	a31
MOSZCZYŃSKA	Ida	DESY / EuXFEL	A1		a32
RAJH	AVA	SOLEIL	A3		a34
REICH	Veronika	DESY / EuXFEL	A3		a35
RODRIGUEZ	Irene	SOLEIL	A2		a36
SANNA ANGOTZI	Marco	PSI	A2	W1	a37
SAVATOVIC	Sara	DESY / EuXFEL	A4		a38



SURNAME	Name	Site	Group	Subgroup	#
SCHWAIGHOFER	Bettina	SOLEIL	A1		a39
SERBAN	David-Alexandru	KIT	A		a40
SHARMA	Shweta	PSI	A3	W3	a41
SIMONNE	David	PSI	A2	W3	a42
SOLEMSLI	Bjørn Gading	PSI	A3	W1	a43
STRUCKA	Jergus	DESY / EuXFEL	A4		a44
SU	Po-Hua	DESY / EuXFEL	A4		a45
VOSEGAARD	Emilie Skytte	DESY / EuXFEL	A3		a46
VOSTROV	Nikita	SOLEIL	A1		a47
WARTELLE	Alexis	DESY / EuXFEL	A2		a48
WENG	Xiaorong	DESY / EuXFEL	A1		a49
XIE	Wu	SOLEIL	A3		a50
YEHYA	Sarah	DESY / EuXFEL	A1		a51
ZIMMERMANN	Valentin	PSI	A4	W2	a52

Following late cancellations (#a04, a05, a11, a33), Session A is constituted of 48 full-time participants.

## SESSION B

SURNAME	Name	Site	Group	#
ANINDYA	Atsarina Larasati	DESY / EuXFEL	B	b01
BARCLAY	Abigail	SOLEIL	B1	b02
BARLETTI	Beatrice	SOLEIL	B1	b03
BUVALAIA	Ekaterina	KIT	B	b04
DIEZ	Matthias Raimund	KIT	B	b05
DOMINICI	Clarissa	PSI	B	b06
IVANOVIC	Aleksandra	SOLEIL	B1	b07
KABBINALE	Arpitha	DESY / EuXFEL	B	b08
LÓPEZ HERNÁNDEZ	Marcos	SOLEIL	B2	b09
LUND	Xamuel	DESY / EuXFEL	B	b10
MELICHER	Filip	SOLEIL	B2	b11
MEŠKOVÁ	Kludia	PSI	B	b12
MIKHAILOVSKAIA	Alesia	PSI	B	b13
MOROTTI	Ilaria	SOLEIL	B1	b14
NG	Yi Min	SOLEIL	B2	b15
NIDRICHE	Agathe	PSI	B	b16
OLSSON	Martina	KIT	B	b17
PETER	Karolina	KIT	B	b18
SAKR	Charbel	SOLEIL	B2	b19
SKOBELKINA	Anastasiia	DESY / EuXFEL	B	b20

## LIST OF PART-TIME PARTICIPANTS

## SESSION A

SURNAME	Name
ADANKOVA	Olga
AKBAR	Fahrurrozi
BALUGANI	Sofia
BERTELSEN	Andreas
BHATT	Harsh
BONNET	Clément
CZAMLER	Valentin
DEWI	Sari Hasnah
FAZLIC	Ida
FRACHET	Mehdi
FRANSSON	Matilda
GIRON LANGE	Esther
GRABIAS	Ewelina
HANSEN	Steen Hansgaard
HARRUP	Anthony Albert
HUA	Weicheng
IRRAZABAL MOREDA	Olvido
KATO	Tatsuya
KICIOR	Inga
Kiranjot	Kiranjot
KULOW	Anico

SURNAME	Name
LERCHE	Julie Toftelund
LIAO	Chenyang
LYU	Jieli
MALATO PRAXEDES	Fernanda
MIROLO	Marta
MORENO BAYONA	Diana Alejandra
NAWAZ	Noor
OEMRY	Ferensa
PARMAR	Rohan
PHILIPPE	Jonas
POELCHEN	Georg
RAHIDE	Fatemehsadat
RONOVSKY	Michal
SCHMEISSNER	Johann
SEBOLD	Simon
TRAUSA	Annamarija
VINCI	Valentin
VINOGRAD	Igor
VOLODINA	Natalia
YAKOVLEV	Ilya
ZHENG	Chenwei

## SESSION B

SURNAME	Name
GUPTA	Jyoti
NGUYEN	Tu Quynh
PATRIATI	Arum
PLATUNOV	Mikhail

## PROGRAMME ONLINE of GRENoble

## SCHEDULE FOR SESSION A

	Common lectures
	Session A lectures
	Other

Last update 14/02/2022

Week 1: 28<sup>th</sup> to 4<sup>th</sup> March

	Monday 28	Tuesday 1	Wednesday 2	Thursday 3	Friday 4
8:40 – 9:25 10' break 9:35 – 10:20		Introduction to interactions of X-rays and neutrons with matter (2/2) <i>Andrew Harrison</i>	Neutrons: scattering and instrumentation (2/2) <i>Andrew Wildes</i>	Hard X-ray optics for SR beamlines <i>Ray Barrett</i>	From a diffraction experiment to the crystal structure <i>Marc de Boissieu</i>
	09:30 – 10:30 <b>Welcome</b> <i>Marc de Boissieu and Béatrice Grenier</i>				Training on Crystallography (1/2) <i>Claire Colin &amp; Béatrice Grenier</i>
10:50 – 11:35 10' break 11:45 – 12:30	Introduction to the science at large scale facilities: neutron, synchrotron and XFEL sources <i>Marc de Boissieu</i>	Neutrons: scattering and instrumentation (1/2) <i>Andrew Wildes</i>	Crystallography (1/2) <i>Béatrice Grenier</i>	Crystallography (2/2) <i>Béatrice Grenier</i>	Introduction to X-ray Spectroscopies <i>Sakura Pascarelli</i>
14:00 – 14:45 10' break 14:55 – 15:40	Introduction to interactions of X-rays and neutrons with matter (1/2) <i>Andrew Harrison</i>	ESRF & ILL presentations (45' each) <i>F. Sette &amp; P. Langan</i> + UGA presentation (15') <i>H. Courtois</i>	<b>ESRF visit</b> <i>Yannick Lacaze and ESRF staff</i>	<b>ILL visit</b> <i>Andrew Wildes</i>	Fundamentals of X-ray Absorption Fine Structure Spectroscopy <i>Sakura Pascarelli</i>
16:10 – 16:55 10' break 17:05 – 17:50	Introduction to Synchrotron Radiation, Coherence, and the Evolution to Free Electron Lasing <i>David Attwood</i>	X-ray Optics and Applications <i>David Attwood</i>	Basics of X-ray Detectors; How do they work and how are they characterised? <i>Heinz Graafsma</i>	Small angle scattering <i>Martin Müller</i>	<b>Questions on lectures</b> <i>(with lecturers of the week, A and B together)</i>
	18:00 <b>Welcome cocktail on Gather town</b>				

## SCHEDULE FOR SESSION A

### Week 2: 7<sup>th</sup> to 11<sup>th</sup> March

	Monday 7	Tuesday 8	Wednesday 9	Thursday 10	Friday 11
8:40 – 9:25 10' break 9:35 – 10:20	Introduction to neutron and X-ray inelastic scattering <i>Christiane Alba-Simionesco</i>	9:00 – 12:30  <b>ESRF PRACTICALS</b> <i>(in small groups)</i>	9:00 – 12:30  <b>ESRF PRACTICALS / TUTORIALS</b> <i>(in small groups)</i>	Data science: from big & open data to cloud computing <i>Vincent Favre-Nicolin</i>	Introduction to magnetism <i>Luigi Paolasini</i>
10:50 – 11:35 10' break 11:45 – 12:30	Introduction to imaging techniques <i>Federica Marone</i>			Training on Crystallography (2/2) <i>Claire Colin &amp; Béatrice Grenier</i>	High resolution inelastic X-ray scattering <i>Matthieu Le Tacon</i>
14:00 – 14:45 10' break 14:55 – 15:40	X-ray photon correlation spectroscopy <i>Gerhard Grübel</i>	14:00 – 17:30  <b>ESRF PRACTICALS</b> <i>(in small groups)</i>	14:00 – 17:30  <b>ESRF PRACTICALS / LABS / TUTORIALS</b> <i>(in small groups)</i>	Full-field coherent Imaging <i>Peter Cloetens</i>	14:00 – 14:30 DECTRIS <i>Dubravka Sisak Jung</i>
16:10 – 16:55 10' break 17:05 – 17:50	Powder diffraction <i>Radovan Cerny</i>			Serial (femtosecond) crystallography <i>Thomas Barends</i>	14:30 – 18:00 <b>POSTER SESSION</b> on Gather Town
18:00 – 19:00				<b>Questions on lectures</b> <i>(with lecturers of the week, A and B together)</i>	

## SCHEDULE FOR SESSION A

Week 3: 14<sup>th</sup> to 18<sup>th</sup> March

	Monday 14	Tuesday 15	Wednesday 16	Thursday 17	Friday 18
8:40 – 9:25 10' break 9:35 – 10:20	FELs & ultrafast applications <i>Sakura Pascarelli</i>	Magnetic neutron diffraction <i>Navid Qureshi</i>	Neutron and X-ray reflectometry <i>Oliver Seock</i>	Resonant diffraction <i>Vincent Favre-Nicolin</i>	Dynamical theory of diffraction <i>Tilo Baumbach</i>
10:50 – 11:35 10' break 11:45 – 12:30	Science at neutron spallation sources: exploiting accelerator based facilities <i>Sean Langridge</i>	Polarised Neutrons: Theoretical and Experimental Techniques for the Study of Atomic, Molecular and Nanoscale Systems <i>Sean Langridge</i>	Neutron triple axis spectroscopy <i>Bella Lake</i>	Neutron time of flight spectroscopy <i>Toby Perring</i>	Neutron backscattering and spin-echo spectroscopies <i>Orsolya Czakkel</i>
14:00 – 14:45 10' break 14:55 – 15:40	Polarized X-rays <i>Urs Staub</i>	<b>TUTORIALS</b> (in small groups)	Disorder and its effects on neutron and X-ray diffraction <i>Marc de Boissieu</i>	<b>“How to write a good proposal”</b>  <i>Alex Fernandez-Martinez,</i> <i>Joanne Mc Carthy,</i>  <i>and members of the organising committee</i>	Soft condensed matter <i>Adrian Rennie</i>
16:10 – 16:55 10' break 17:05 – 17:50	Liquid and amorphous materials <i>Adrian Barnes</i>		16:10 – 17:10 Ancient materials research with synchrotron and neutron techniques <i>Sebastian Schoeder</i>		17:20 Fostering Science <i>Thibaut David</i> 17:35 NFFA-EUROPE-PILOT <i>Anthony Leonard</i>

## SCHEDULE FOR SESSION A

### Week 4: 21<sup>st</sup> to 25<sup>th</sup> March: 'Outside' Grenoble

### Week 5: 28<sup>th</sup> March – 1<sup>st</sup> April

	Monday 28	Tuesday 29	Wednesday 30	Thursday 31	Friday 1
8:40 – 9:25 10' break 9:35 – 10:20	9:00 – 12:30	Magnetic X-ray and neutron reflectivity <i>Björgvin Hjörvarsson</i>	Coherent diffractive imaging and ptychography <i>Manuel Guizar-Sicairos</i>	Photoelectron spectroscopy from UV to soft X-rays <i>Hugo Dil</i>	<b>8:40 – 9:40</b> Materials for energy <i>Sandrine Lyonnard</i>
10:50 – 11:35 10' break 11:45 – 12:30		ILL TUTORIALS with demonstrations (in small groups)	Single-crystal X-ray diffraction applied to electron density analysis <i>Enrique Espinosa</i>	X-ray photoemission electron microscopy <i>Claus M. Schneider</i>	Coherent and transient states studied with X-rays FELS <i>Carlo Callegari</i>
14:00 – 14:45 10' break 14:55 – 15:40	14:00 – 17:30		X-ray absorption spectroscopy: theoretical basis <i>Amélie Juhin</i>	TUTORIALS (in small groups)	TUTORIALS (in small groups)
16:10 – 16:55 10' break 17:05 – 17:50		Solving surface problems using SR techniques <i>Gilles Renaud</i>	<b>16:10 – 17:10</b> Hercules Mythology <i>Chris Buckley</i>		
					<b>17:20 – 18:30</b> EVALUATION MEETING
18:30 – 20:30					<b>Farewell wine and cheese on Gather Town</b>

## PRACTICALS / LABS / TUTORIALS FOR SESSION A

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

**Contact:** Béatrice GRENIER (grenier\_at\_ill.fr)

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 remote tutorials/demo at Institut Laue Langevin (ILL) and three remote practicals at European Synchrotron Radiation Facility (ESRF), delivered mostly by instrument responsables and beamline scientists. In addition, they will participate in remote tutorials (mostly data treatment) and in an X-ray lab (for a few people), taught by staff / users of large scale facilities essentially (three tutorials / labs in total).

All full-time participants will follow additional practicals / tutorials during week 4, fully organised by our partners. Four different groups have been constituted, each following the programme organised by one of the following partner facilities:

- the German synchrotron radiation facility Deutsches Elektronen-Synchrotron (**DESY**) and the **European XFEL** in Hamburg, hopefully ON SITE,
- the Karlsruhe Institute of Technology (**KIT**) Light Source in Karlsruhe, ONLINE,
- the Swiss synchrotron radiation facility Swiss Light Source (**SLS**) and the Swiss spallation neutron source **SINQ** at the Paul Scherrer Institute (PSI) in Villigen, ONLINE,
- the French synchrotron **SOLEIL** Saint-Aubin, close to Paris, hopefully ON SITE.

Among these groups (except for KIT where the 8 participants form a single group), the participants have been distributed in groups of 4 at the various partner facilities (A1, A2, ... at each site). 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 a72). All the information regarding groups A1, A2, ... and the numbering a01, a02, ... can be found in the PRACTICAL INFORMATION section of this booklet.

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

The list of all practicals / labs / tutorials (titles and instructors) is given in the following pages, together with the groups A1, A2, ..., and participants a01, a02, ... assignment (refer to pages 16 – 18), and the complete individual schedule for all participants can be found on a separate 2 pages 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 program assigned to them.**

\* **Practical:** hands-on training on large scale facility instruments ; **Lab:** hands-on training on laboratory experiments ;  
**Tutorial:** data treatment (on data recorded beforehand).

## ► Remote tutorials/demo at ILL, Grenoble

28<sup>th</sup> MARCH, 9:00 – 12:30 and 14:00 – 17:30



INSTRUMENT	INSTRUCTOR(S)	TITLE	28 <sup>th</sup> March	
			9:00	14:00
D1B	PUENTE ORENCH Inés	Microstructure of nanoparticles	a01 a08 a13 a23 a47	
D4	FISCHER Henry	PDF-analysis for the structure of disordered materials	a17 a27 a31 a37	a01 a06 a08 a09 a10 a30 a46 a47
D17	SAERBECK Thomas	Exploring thin-film structure and magnetism with neutron reflectometry	a20 a21 a26 a48 a49 a52	a14 a18 a37 a39 a40
D20	HANSEN Thomas	Fast neutron Powder diffraction	a06 a25 a35 a40 a46	a02 a07 a22 a32 a38 a44 a45
D22	CUBITT Robert	Data Reduction and Analysis of an Experiment with Superconducting Niobium - a Model SANS system	a07 a18 a14 a28 a38 a45 a50	a15 a17 a27 a34 a36
D23	BEAUVOIS Ketty	Single crystal two-axis neutron diffraction: field-induced magnetic structure in Cs <sub>3</sub> Cr <sub>2</sub> Br <sub>9</sub>		a21 a26 a48 a49
IN8	PIOVANO Andrea	Phonon dispersion in beta-tin	a10 a24 a41 a42 a44	
Sharp / IN5 (1)	BERROD Quentin, PETIT Sylvain	Quasi-Elastic Neutron Scattering in materials for energy	a09 a12 a22 a32 a34 a39	
Sharp / IN5 (2)	PETIT Sylvain	Spin dynamics in Mn <sub>12</sub> acetate		a20 a28 a35 a50 a52
S-ADAM / FIGARO	GUTFREUND Philipp	Investigation of thin films by means of neutron reflectometry	a02 a03 a16 a29 a51	a12 a19 a23 a24 a42 a43
SALSA	PIRLING Thilo	Neutron diffraction based stress characterization for engineering applications	a15 a19 a30 a36 a43	a03 a13 a16 a25 a29 a31 a41 a51

Due to the online format of the school, the reactor shutdown, and the ongoing works for upgrades at ILL, not all the instructors will be able to make a demonstration or a virtual visit of the instrument, hence these teachings will unfortunately be more tutorials like than practicals.

You can find information on the various neutron instruments listed above at the following URL:  
<https://www.ill.eu/users/instruments/instruments-list>



## ► Remote practicals at ESRF, Grenoble

8<sup>th</sup> and 9<sup>th</sup> MARCH, 9:00 – 12:30 and 14:00 – 17:30



BEAMLINE	INSTRUCTOR(S)	TITLE	8 <sup>th</sup> March		9 <sup>th</sup> March	
			9:00	14:00	9:00	14:00
BM02 align	BEUTIER Guillaume, BLANC Nils, CHAHINE Gilbert	Alignment of a beamline for a single crystal diffraction experiment	a02 a14 a18			
BM02	BEUTIER Guillaume, BLANC Nils, CHAHINE Gilbert	Forbidden reflections in a Germanium single crystal		a02 a03 a23 a25 a46	a07 a14 a20 a49 a50	a15 a32 a34 a37 a47
BM08	D'ACAPITO Francesco, BARONI Tommaso	Practical introduction to the EXAFS technique	a08 a37 a41 a44 a49	a07 a15 a29 a34	a09 a21 a40 a45	a16 a23 a30 a42
BM23	ATZORI Cesare, LOMACHENKO Kirill	X-ray absorption spectroscopy	a03 a24 a35 a51	a10 a13 a32 a48	a01 a06 a26 a46	a17 a18 a19 a22 a25 a27 a28
ID01 (1)	BELLEC Ewen, LEAKE Steven	Wavefront reconstruction and Bragg coherent diffraction imaging	a01 a07 a13 a38 a40 a52	a06 a16 a33		
ID01 (2)	LEAKE Steven, ZATTERIN Edoardo	Scanning X-ray Diffraction Microscopy			a41 a48 a51	a10 a12 a13 a24 a29 a38
ID09	LEVANTINO Matteo, MARIETTE Céline, VOLTE Alix	Time-resolved X-ray scattering			a02 a03 a08 a31 a52	
ID11	AUTRAN Pierre-Olivier, GIACOBBE Carlotta, LAWRENCE-BRIGHT Eleanor, LUDWIG Wolfgang, WRIGHT Jonathan	Diffraction tomography based techniques	a06 a09 a36 a48	a14 a28 a35 a40 a44		
ID12	WILHELM Fabrice	Hard X-ray XMCD	a17 a20 a26 a28	a21 a37 a49 a50		
ID15B	HANFLAND Michael	Crystallography in a diamond anvil cell	a22 a29 a39 a46	a12 a20 a24 a52		
ID19	BROCHE Ludovic, MAJKUT Marta, RACK Alexander	Synchrotron-based microtomography	a10 a19 a30 a31 a47	a38 a39 a41 a42		
ID21	COLOCHO HURTARTE Luis, VERONESI Giulia	Multi-modal micro-analyses for cultural heritage		a01 a18 a19 a36 a45		
ID22	CONFALONIERI Giorgia, GRENDAL Ola	High resolution powder diffraction	a21 a27 a43 a45	a08 a22 a47 a51		
ID27	MEZOUAR Mohamed, PAKHOMOVA Anna, POREBA Tomasz, WEHINGER Bjorn	Structure of materials under high pressure	a15 a16 a32 a34 a50	a09 a17 a26 a27 a30 a31 a43		
ID28	BOSAK Alexei, CHANEY Daniel	Diffuse scattering in minerals	a12 a23 a25 a42			a35 a39 a43 a44

Due to the online format, a few practicals will be more tutorials like (i.e., without live data acquisition).

### ► Remote tutorials and X-ray Lab

9<sup>th</sup>, 15<sup>th</sup>, 30<sup>th</sup>, and 31<sup>st</sup> MARCH, 9:00 – 12:30 and/or 14:00 – 17:30



TUTORIAL	INSTRUCTOR(S)	TITLE	9 <sup>th</sup> March		15 <sup>th</sup> March	30 <sup>th</sup> March	31 <sup>st</sup> March
			9:00	14:00	14:00	14:00	14:00
<b>Aperiodic</b>	PEREZ Olivier	Beyond classical crystal order					a13 a20 a30 a32 a51
<b>Bilbao</b>	DE BRION Sophie	Introduction to Bilbao Crystallographic server				a20 a26 a28 a50 a52	
<b>CDI-Ptycho</b>	FAVRE-NICOLIN Vincent	Coherent X-ray Imaging analysis with PyNX (CDI, Ptychography...)			a02 a06 a16 a40		
<b>Data Reduc</b>	KIEFFER Jerome	Data reduction with pyFAI				a06 a15 a25 a36 a38 a45	
<b>GSAS-II</b>	TOBY Brian	An introduction to GSAS-II				a08 a09 a14 a27 a46	a25 a31 a42 a43
<b>JANA</b>	HENRIQUES Margarida, PETRICEK Vaclav, POUPON Morgane	Crystallographic structure refinement using Jana2020				a03 a18 a40	
<b>JANA mag</b>	HENRIQUES Margarida, PETRICEK Vaclav, POUPON Morgane	Magnetic crystallography and solution of magnetic structures in Jana2020					a17 a28 a46 a48 a50 a52
<b>MAGDIF</b>	PADDISON Joseph	Magnetic diffuse scattering			a17 a21 a48 a50 a52		
<b>McStas</b>	WEBER Tobias	Neutron scattering simulations with McStas					a02 a14 a18 a21 a35
<b>microLAUE</b>	MICHA Jean-S�bastien, PURUSHOTTAM Ravi Raj Purohit	X-Ray Laue Microdiffraction			a08 a32 a34 a37	a07 a16 a29 a39	a03 a22 a27 a40 a45
<b>OASYS</b>	REYES-HERRERA Juan, SANCHEZ DEL RIO Manuel	Modelling synchrotron radiation beamlines with Oasys			a15 a22 a35 a42 a49		

TUTORIAL	INSTRUCTOR(S)	TITLE	9 <sup>th</sup> March		15 <sup>th</sup> March	30 <sup>th</sup> March	31 <sup>st</sup> March
			9:00	14:00	14:00	14:00	14:00
<b>Ptycho</b>	DA SILVA Julio Cesar	PXCT data analysis: phase retrieval and tomographic reconstruction			a01 a03 a43		a10 a15 a36 a41 a47
<b>Reflecto</b>	RIEUTORD François, TARDIF Samuel	Introduction to reflectometry to investigate flat surfaces and interfaces			a10 a12 a14 a18		
<b>RIXS</b>	NICOLAOU Alessandro	Resonant inelastic X-ray scattering in the soft X-ray regime for strongly correlated electron systems	a12 a13 a17 a22 a28 a34		a23 a24 a29 a39 a44		
<b>SPINWAVE</b>	PETIT Sylvain	1) Spin waves, 2) Spin and lattice dynamics in AgCrS <sub>2</sub>		a20 a21 a26 a48			
<b>TAS</b>	BOUNOUA Dalila	Triple axis spectrometer measurements of the phonons dispersion in CaF <sub>2</sub>		a01 a08 a46 a49			a12 a23 a29 a37
<b>TOMO</b>	FREDERIC OTT	Data processing in neutron radiography		a02 a06 a07 a51	a19 a25 a30 a31 a36 a38		
<b>TOPO</b>	BARUCHEL José, TRAN CALISTE Thu Nhi	Bragg Diffraction Imaging to study defects in crystals			a07 a09 a13 a41 a51		
<b>XAS 1</b>	JOLY Yves	Simulation of X-ray absorption spectroscopies				a23 a43 a44 a47 a49	
<b>XAS 2</b>	RETEGAN Marius	X-ray spectroscopy calculations using multiplet approaches				a01 a37 a42	a24 a26 a34 a39
<b>XPCS</b>	CHUSHKIN Yuriy	XPCS data analysis and practice	a10 a16 a19 a24 a30 a32 a35 a38 a44				
<b>XRF</b>	SEGURA-RUIZ Jaime	Nano-characterization using a hard X-rays nanoprobe: ID16B beamline at the ESRF and its multi-modal detection setup			a27 a45 a47		

LAB	INSTRUCTOR(S)	TITLE	9 <sup>th</sup> March		15 <sup>th</sup> March	30 <sup>th</sup> March	31 <sup>st</sup> March
			9:00	14:00	14:00	14:00	14:00
<b>XPD lab</b>	LEYNAUD Olivier	Powder X-Ray Diffraction		a09 a31 a41			

For some of the tutorials, you will need to install **specific softwares** beforehand, to be able to do the data treatment. **Please refer to the next page.**

**NB:** Mouna Hamid (#a19) and Irene Rodriguez Fernandez (#a36) have been assigned a practical/tutorial from the B session (see pages 37-38).

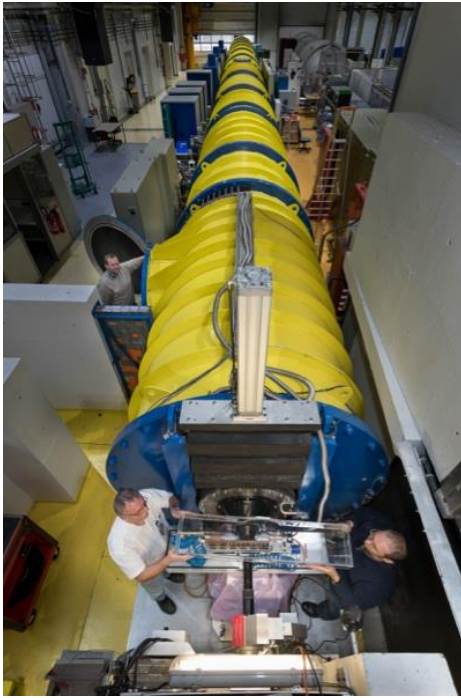
Software installation instructions and operating system (OS) needed for the various tutorials:

TUTORIAL	Software installation instructions	OS
Aperiodic	Jana and Crysalis pro	Windows
Bilbao	Link for the Bilbao crystallographic server: <a href="https://www.cryst.ehu.es">https://www.cryst.ehu.es</a>	Windows
CDI-Ptycho	No software to install beforehand	any OS
Data Reduc	Instruction on how to install pyFAI will be provided shortly before the tutorial	any OS
GSAS-II	See <a href="http://bit.ly/GSASII">http://bit.ly/GSASII</a> for installation instructions.	any OS
JANA	Jana2020, latest version: <a href="https://jana-login.fzu.cz/home">https://jana-login.fzu.cz/home</a>	Windows
JANA mag	Jana2020, latest version: <a href="https://jana-login.fzu.cz/home">https://jana-login.fzu.cz/home</a>	Windows
MAGDIF	Spinvert: <a href="http://www.joepaddison.com/software">www.joepaddison.com/software</a> Veusz: <a href="https://veusz.github.io">https://veusz.github.io</a> (for data plotting)	any OS
McStas	A Linux distribution, for example Ubuntu (under Windows and MacOS this can be installed in a virtual machine like VirtualBox, <a href="https://www.virtualbox.org">https://www.virtualbox.org</a> ); McStas version 3: <a href="http://mcstas.org">http://mcstas.org</a>	any OS
microLAUE	LaueTools and LaueToolsNN softwares	Windows or Linux
OASYS	Oasys: <a href="https://github.com/oasys-kit/oasys-installation-scripts/wiki#install-oasys-in-your-system">https://github.com/oasys-kit/oasys-installation-scripts/wiki#install-oasys-in-your-system</a>	any OS
Ptycho	Python and Jupyter notebook, but all the instructions will be sent beforehand	any OS
Reflecto	GenX 3, available at <a href="https://aglavic.github.io/genx/">https://aglavic.github.io/genx/</a>	any OS
RIXS	ImageReducer for extracting the RIXS spectra (the link will be sent beforehand); Crispy for multiplet calculations ( <a href="https://www.esrf.fr/computing/scientific/crispy/">https://www.esrf.fr/computing/scientific/crispy/</a> )	any OS
SPINWAVE	An e-mail with the installations instructions will be sent beforehand	any OS
TAS	Any software to draw curves and do fitting (Matlab, Python, or Igor Pro)	any OS
TOMO	ImageJ	Windows
TOPO	?	
XAS 1	FDMNES. A specific package will be provided latter. You must have your own software, such as Origin, Kaleidagraph,....., to plot spectra.	any OS
XAS 2	Crispy ( <a href="http://www.esrf.eu/computing/scientific/crispy">http://www.esrf.eu/computing/scientific/crispy</a> )	any OS
XPCS	no software needed	
XRF	PyMca	any OS
XPD lab	no software needed	

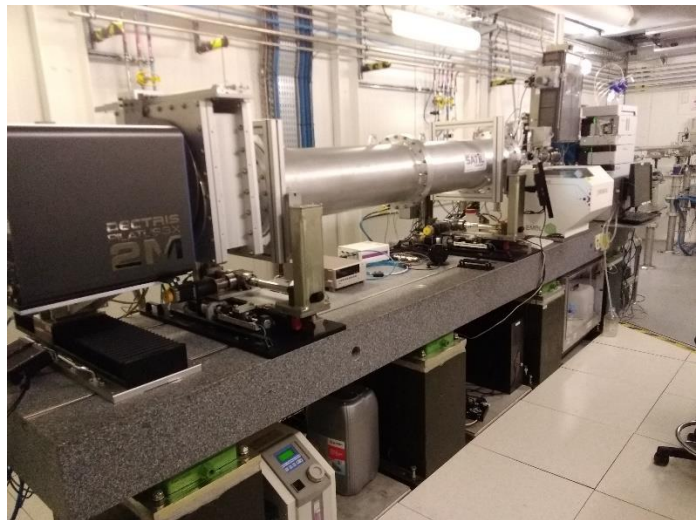
Some of the instructors will send you an e-mail before the tutorial to give you (further) instructions about the software installation.

If some of you do not have the required OS system, you may request the remote control to another participant from time to time, so that you are also able to work during the tutorial.

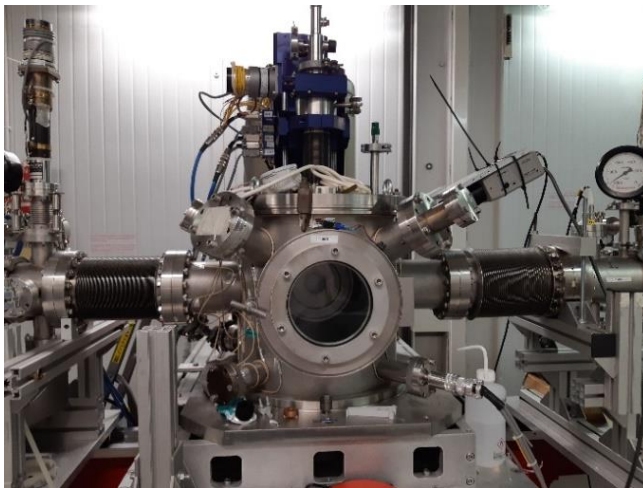
Do not hesitate to contact your instructor beforehand if you have any question about the operating system and/or the software installation. You can find their e-mail addresses at the end of the booklet.



Small Angle Neutron Scattering, D11 @ ILL



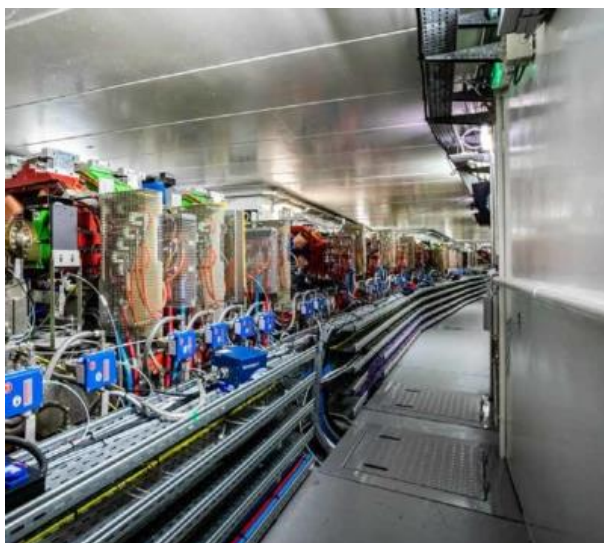
Small angle X-ray scattering, BM29 @ ESRF



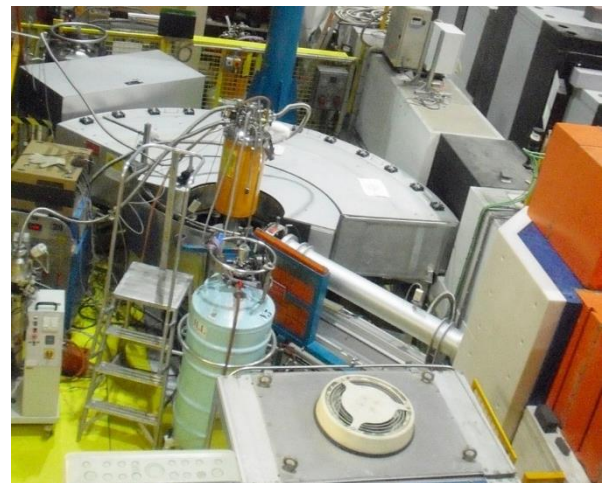
Extended X-ray Absorption Fine Structure, BM08 @ ESRF



Time Of Flight neutron spectrometry, IN5 @ ILL



EBS storage ring @ ESRF



Powder Neutron Diffraction, D1B @ ILL



## PROGRAMME ONLINE of GRENoble

## SCHEDULE FOR SESSION B

	Common lectures
	Session B lectures
	Other

Last update 10/02/2022

Week 1: 28<sup>th</sup> February to 4<sup>th</sup> March

	Monday 28	Tuesday 1	Wednesday 2	Thursday 3	Friday 4
8:40 – 9:25 10' break 9:35 – 10:20	09:30 – 10:30 <b>Welcome</b> <i>Marc de Boissieu and Béatrice Grenier</i>	Introduction to interactions of X-rays and neutrons with matter (2/2) <i>Andrew Harrison</i>	Neutrons: scattering and instrumentation (2/2) <i>Andrew Wildes</i>	Hard X-ray optics for SR beamlines <i>Ray Barrett</i>	From a diffraction experiment to the crystal structure <i>Marc de Boissieu</i> Training on Crystallography (1/2) <i>Claire Colin &amp; Béatrice Grenier</i>
10:50 – 11:35 10' break 11:45 – 12:30	Introduction to the science at large scale facilities: neutron, synchrotron and XFEL sources <i>Marc de Boissieu</i>	Neutrons: scattering and instrumentation (1/2) <i>Andrew Wildes</i>	Crystallography (1/2) <i>Béatrice Grenier</i>	Crystallography (2/2) <i>Béatrice Grenier</i>	Introduction to X-ray Spectroscopies <i>Sakura Pascarelli</i>
14:00 – 14:45 10' break 14:55 – 15:40	Introduction to interactions of X-rays and neutrons with matter (1/2) <i>Andrew Harrison</i>	ESRF & ILL presentations (45' each) <i>F. Sette &amp; P. Langan</i> + UGA presentation (15') <i>H. Courtois</i>	<b>ESRF visit</b> <i>Yannick Lacaze and ESRF staff</i>	<b>ILL visit</b> <i>Andrew Wildes</i>	Fundamentals of X-ray Absorption Fine Structure Spectroscopy <i>Sakura Pascarelli</i>
16:10 – 16:55 10' break 17:05 – 17:50	Introduction to Synchrotron Radiation, Coherence, and the Evolution to Free Electron Lasing <i>David Attwood</i>	X-ray Optics and Applications <i>David Attwood</i>	Basics of X-ray Detectors; How do they work and how are they characterised? <i>Heinz Graafsma</i>	Small angle scattering <i>Martin Müller</i>	<b>Questions on lectures</b> <i>(with lecturers of the week, A and B together)</i>
	<b>18:00</b> <b>Welcome cocktail on Gather town</b>				

## SCHEDULE FOR SESSION B

Week 2: 7<sup>th</sup> to 11<sup>th</sup> March

	Monday 7	Tuesday 8	Wednesday 9	Thursday 10	Friday 11
8:40 – 9:25 10' break 9:35 – 10:20	Introduction to neutron and X-ray inelastic scattering <i>Christiane Alba-Simionesco</i>	9:00 – 12:30  <b>ESRF PRACTICALS</b> <i>(in small groups)</i>	9:00 – 12:30  <b>ESRF PRACTICALS</b> <i>(in small groups)</i>	Handling big data <i>Vincent Favre-Nicolin</i>	X-ray spectroscopy <i>Serena DeBeer</i>
10:50 – 11:35 10' break 11:45 – 12:30	Introduction to imaging techniques <i>Federica Marone</i>			Training on Crystallography (2/2) <i>Claire Colin &amp; Béatrice Grenier</i>	Solution X-ray Scattering from Biological Macromolecules <i>Mirjam Czjzek</i>
14:00 – 14:45 10' break 14:55 – 15:40	Protein crystallography: data collection and reduction, phasing (1/2) <i>Mark Roe</i>	14:00 – 17:30  <b>ESRF PRACTICALS</b> <i>(in small groups)</i>	14:00 – 17:30  <b>ESRF PRACTICALS</b> <i>(in small groups)</i>	Full-field coherent Imaging <i>Peter Cloetens</i>	14:00 – 14:30 DECTRIS <i>Dubravka Sisak Jung</i>
16:10 – 16:55 10' break 17:05 – 17:50	Electron microscopy for structural biology <i>Ambroise Desfosses</i>			Serial (femtosecond) crystallography <i>Thomas Barends</i>	14:30 – 18:00 <b>POSTER SESSION</b> on Gather Town
18:00 – 19:00				<b>Questions on lectures</b> <i>(with lecturers of the week, A and B together)</i>	



## SCHEDULE FOR SESSION B

Week 3: 14<sup>th</sup> to 18<sup>th</sup> March

	Monday 14	Tuesday 15	Wednesday 16	Tuesday 17	Friday 18
8:40 – 9:25 10' break 9:35 – 10:20	FELs & ultrafast applications <i>Sakura Pascarelli</i>	Crystallization of biological macromolecules: Theoretical and practical aspects of crystallization in solution <i>Monika Spano</i>	Small angle scattering <i>Frank Gabel</i>	Following protein structural changes as they happen with time resolved X-ray techniques <i>Giorgio Schirò</i>	Neutron macromolecular crystallography <i>Matthew Blakeley</i>
10:50 – 11:35 10' break 11:45 – 12:30	Science at neutron spallation sources: exploiting accelerator based facilities <i>Sean Langridge</i>	Protein crystallography: data collection and reduction, phasing (2/2) <i>Mark Roe</i>	Time resolved fluorescence and circular dichroism studies with SR <i>David Clarke</i>	Membrane diffraction <i>Dave Barlow</i>	Non-crystallographic ways of obtaining structural and dynamical information at different length and time scales for biological systems <i>Peter Judge</i>
14:00 – 14:45 10' break 14:55 – 15:40	X-ray and neutron reflectivity in biophysics <i>Yuri Gerelli</i>	<b>“How to write a good proposal”</b>  <i>Giorgio Schirò, Joanne Mc Carthy</i>  <i>and members of the organising committee</i>	Super resolution microscopy: a revolution in biological imaging <i>Dominique Bourgeois</i>	<b>TUTORIALS / LABS</b> <i>(in small groups)</i>	Fibre diffraction <i>Craig Boote</i>
16:10 – 16:55 10' break 17:05 – 17:50	Introduction to current trends and challenges of molecular and structural biology <i>Claude Sauter</i>		16:10 – 17:10 Ancient materials research with synchrotron and neutron techniques <i>Sebastian Schoeder</i>		<b>Questions on lectures</b> <i>(with lecturers of the week, A and B separated)</i>
		17:20 Fostering Science <i>Thibaut David</i>			
		17:35 NFFA-EUROPE-PILOT <i>Anthony Leonard</i>			

## SCHEDULE FOR SESSION B

Week 4: 21<sup>st</sup> to 25<sup>th</sup> March: 'Outside' GrenobleWeek 5: 28<sup>th</sup> March – 1<sup>st</sup> April

	Monday 28	Tuesday 29	Wednesday 30	Thursday 31	Friday 1
8:40 – 9:25 10' break 9:35 – 10:20	Medical imaging with synchrotron radiation <i>Giuliana Tromba</i>	9:00 – 12:30  <b>ILL TUTORIALS with demonstrations</b> <i>(in small groups)</i>	Towards integrated structural biology: studying macromolecular complexes by native mass spectrometry <i>Elisabetta Boeri Erba</i>	Radiation damage in protein crystallography <i>Martin Weik</i>	8:40 – 9:40 Use of synchrotron techniques to study the fate of nanoparticles in cells <i>Isabelle Michaud-Soret</i>
10:50 – 11:35 10' break 11:45 – 12:30	Crystallography of viruses and very large macromolecules <i>David Stuart</i>		Nuclear Magnetic Resonance <i>Martin Blackledge</i>	Integrative biology <i>Annalisa Pastore</i>	10:10 – 11:10 Deuteration for biological research <i>Trevor Forsyth</i>  11:30 – 12:30 Protein Dynamics by Neutron Scattering and Dynamics of Macromolecules <i>Giuseppe Zaccai</i>
14:00 – 14:45 10' break 14:55 – 15:40	Protein Dynamics by Neutron Scattering and Dynamics of Macromolecules <i>Giuseppe Zaccai</i>	14:00 – 17:30  <b>ILL TUTORIALS with demonstrations</b> <i>(in small groups)</i>	<b>TUTORIALS / LABS</b> <i>(in small groups)</i>	<b>TUTORIALS / LABS</b> <i>(in small groups)</i>	Analysis and visualization of 3D imaging data <i>Chris Buckley</i>
16:10 – 16:55 10' break 17:05 – 17:50	Coherent diffraction imaging and ptychography for soft condensed matter and biology <i>Chris Jacobsen</i>				16:10 – 17:10 Hercules Mythology <i>Chris Buckley</i>
18:30 – 20:30					17:20 – 18:30 <b>EVALUATION MEETING</b>
					<b>Farewell wine and cheese on Gather Town</b>

## PRACTICALS / LABS / TUTORIALS FOR SESSION B

**Coordinators:** Béatrice GRENIER, Didier NURIZZO, Petra PERNOT, Giorgio SCHIRO

**Contact:** Béatrice GRENIER

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 remote tutorials/demo at Institut Laue Langevin (ILL) and two, three, or four remote practicals at European Synchrotron Radiation Facility (ESRF), delivered mostly by instrument responsables and beamline scientists. In addition, they will participate in remote tutorials (mostly data treatment) and labs (on experiments located at IBS), taught by staff / users of large scale facilities essentially (three to five tutorials / labs in total).

All full-time participants will follow additional practicals / tutorials during week 4, fully organised by our partners. Four different groups have been constituted, each following the programme organised by one of the following partner facilities:

- the German synchrotron radiation facility Deutsches Elektronen-Synchrotron (**DESY**) and the **European XFEL** in Hamburg, hopefully ON SITE,
- the Karlsruhe Institute of Technology (**KIT**) Light Source in Karlsruhe, ONLINE,
- the Swiss synchrotron radiation facility Swiss Light Source (**SLS**) and the Swiss spallation neutron source **SINQ** at the Paul Scherrer Institute (PSI) in Villigen, ONLINE,
- the French synchrotron **SOLEIL** Saint-Aubin, close to Paris, hopefully ON SITE.

SOLEIL will welcome 8 participants from the B session, divided in groups B1 and B2, while the other partners will welcome 4 participants from the B session (group B). At a given partner facility, the students from the same group will follow the same practicals / tutorials program. As concerns practicals / labs / tutorials organised by 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 b20). All the information regarding the various groups and the numbering b01, b02, ... can be found in the PRACTICAL INFORMATION section of this booklet.

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

The list of all practicals / labs / tutorials (titles and instructors) is given in the following pages, together with the groups B, B1, or B2 and participants b01, b02, ... assignment (refer to pages 16 – 18), and the complete individual schedule for all participants can be found on a separate 2 pages 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 program assigned to them.**

\* **Practical:** hands-on training on large scale facility instruments ; **Lab:** hands-on training on laboratory experiments ;  
**Tutorial:** data treatment (on data recorded beforehand).

## ► Remote tutorials/demo at ILL, Grenoble

29<sup>th</sup> MARCH, 9:00 – 12:30 and 14:00 – 17:30



INSTRUMENT	INSTRUCTOR(S)	TITLE	29 <sup>th</sup> March	
			9:00	14:00
D22	MATSARSKAIA Olga	SANS for biology	b02 b06 b10 b12 b18 b20	
IN13 / IN16B	PETERS Judith	Biomolecular motions probed by neutron scattering	b03 b05 b08 b09 b13	b02 b04 b07 b14 b16 b20
IN15	HOFFMANN Ingo	Short Introduction to NSE	b04 b07 b16 b17	b01 b09 b10 b11 b13 b15 b19
LADI	GAJDOS Lukas	Neutron quasi-Laue data reduction and joint X-ray/neutron refinement	b01 b11 b14 b15 b19	b03 b05 b06 b08 b12 b17 b18

Due to the online format of the school, the reactor shutdown, and the ongoing works for upgrades at ILL, not all the instructors will be able to make a demonstration or a virtual visit of the instrument, hence these teachings will unfortunately be more tutorials like than practicals.

You can find information on the various neutron instruments listed above at the following URL:  
<https://www.ill.eu/users/instruments/instruments-list>

## ► Remote practicals at ESRF, Grenoble

8<sup>th</sup> and 9<sup>th</sup> MARCH, 9:00 – 12:30 and 14:00 – 17:30



BEAMLINE	INSTRUCTOR(S)	TITLE	8 <sup>th</sup> March		9 <sup>th</sup> March	
			9:00	14:00	9:00	14:00
BM05	DOLLMAN Kathleen, JAKATA Kudakwashe	Synchrotron - Tomography	b05 b09 b17 b19	b05 b09 b17 b19	b07 b13 b16 b18 b20	b07 b16 b18
BM29	PERNOT Petra, TULLY Mark, POPOV Anton, MOUSSAOUI Dihia	Macromolecule Small Angle Scattering with X-rays (BioSAXS)	b01 b02 b04 b08 b11 b15 b18		b03 b05 b09 b12 b17 b19 a36	
CM01	KANDIAH Eazhisai, FREIHERR VON SCHOLLEY Gian Luca	Sample preparation and data collection for high resolution cryo electron microscopy			b01 b04 b08 b10 b14 b15	b02 b03 b11 b12 b13 b20
ID09	LEVANTINO Matteo, MARIETTE Céline, VOLTE Alix	Time-resolved X-ray scattering		b07 b10 b14 b16		
ID21	COLOCHO HURTARTE Luis, VERONESI Giulia	Multi-modal micro-analyses for cultural heritage	b03 b06 b07 b12 b13			
ID23, ID30	DE SANCTIS Daniele, ORLANS Julien, BASU Shibom, SANTONI Gianluca	MX data collection in the Alphafold age	b10 b14 b16 b20	b01 b02 b06 b11 b12 b15		
icOS Lab	ROYANT Antoine, ENGILBERGE Sylvain	In crystallo optical spectroscopy at the icOS Lab				b01 b04 b05 b06 b08 b09 b14 b17

Due to the online format, a few practicals will be more tutorials like (i.e., without live data acquisition).

Most of the participants following the practical on BM05 in the morning will then have a tutorial taught by the same instructors, directly related to the practical (as can be seen in the table above).

*One participant from the A session (indicated in blue) will also follow the BioSAXS practical on BM29.*

## ► Remote tutorials and labs

17<sup>th</sup>, 30<sup>th</sup>, and 31<sup>st</sup> MARCH, 14:00 – 17:30



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### Tutorials

TUTORIAL	INSTRUCTOR(S)	TITLE	17 <sup>th</sup> March	30 <sup>th</sup> March	31 <sup>st</sup> March
			14:00	14:00	14:00
BIOINF	GRUDININ Sergei	Structural bioinformatics: modeling with SAXS/SANS data		b04 b08 b11 b16 b19 b20 a19	b02 b03 b05 b06 b09 b10 b14
CDI-Ptycho	FAVRE-NICOLIN Vincent	Coherent X-ray Imaging analysis with PyNX (CDI, Ptychography,..)			b04 b07 b13 b17 b19
FLUO	SANTACALDO Giuseppe	Fluorescence Lifetime Imaging and Phasor approach analysis	b01 b06 b07 b13		
MX	SANTONI Gianluca	Multi-crystal data collection			b01 b08 b11 b12 b15
OASYS	SANCHEZ DEL RIO Manuel, REYES-HERRERA Juan	Modelling synchrotron radiation beamlines with Oasys	b03 b05 b09 b10		
RICS	VETRI Valeria	Raster scan image correlation spectroscopy	b14 b17 b18 b19		
SAXS	THUREAU Aurélien	SAXS analysis of a SEC-SAXS experiment		b01 b02 b03 b06 b09 b10	

For some of the tutorials, you will need to install **specific softwares** beforehand, to be able to do the data treatment. **Please refer to the next page.**

*One participant from the A session (indicated in blue) will also follow the BIOINF tutorial.*

## Labs / Tutorials at IBS, Grenoble

TUTORIAL / LAB	INSTRUCTOR(S)	TITLE	17 <sup>th</sup> March	30 <sup>th</sup> March	31 <sup>st</sup> March
			14:00	14:00	14:00
COOT	COBESSI DAVID	Macromolecular model building and analysis in electron density maps using COOT	b08 b11 b12 b15		
NMR	FAVIER Adrien	Liquid state NMR practical	b02 b04 b16 b20	b05 b12 b15 b18	
SMLM	GLUSHONKOV Oleksandr	Introduction to Single-Molecule Localization Microscopy (SMLM)		b07 b13 b14 b17	b16 b18 b20

Software installation instructions and operating system (OS) needed for some of the tutorials:

TUTORIAL	Software installation instructions	OS
BIOINF	Pymol + some packages from our website	Linux or Mac OS
CDI-Ptycho	No software to install beforehand	any OS
FLUO	No software to install beforehand	any OS
OASYS	Oasys: <a href="https://github.com/oasys-kit/oasys-installation-scripts/wiki#install-oasys-in-your-system">https://github.com/oasys-kit/oasys-installation-scripts/wiki#install-oasys-in-your-system</a>	any OS
RICS	<a href="https://www.lfd.uci.edu/globals/SimFCS">https://www.lfd.uci.edu/globals/SimFCS</a> 3 trial version	Windows
SAXS	Atsas suite 3.0.4 ( <a href="https://www.embl-hamburg.de/biosaxs/software.html">https://www.embl-hamburg.de/biosaxs/software.html</a> ). I will provide a link to download SAXS curves a few days before the practical.	any OS

Some of the instructors will send you an e-mail before the tutorial to give you (further) instructions about the software installation.

If some of you do not have the required OS system, you may request the remote control to another participant from time to time, so that you are also able to work during the tutorial.

Do not hesitate to contact your instructor beforehand if you have any question about the operating system and/or the software installation. You can find their e-mail addresses at the end of the booklet.





# PROGRAMME of PARTNERS



DESY (Hamburg) – *ON SITE*



European XFEL (Hamburg) – *ON SITE*



KIT (Karlsruhe) – *ONLINE*



SOLEIL (Saint-Aubain, Paris area) – *ON SITE*



SLS and SINQ @ PSI (Villigen) – *ONLINE*

## GENERAL PLANNING for 21 – 25 MARCH

	Monday 21 March	Tuesday 22 March	Wednesday 23 March	Thursday 24 March	Friday 25 March
8:15 - 8:30	Welcome				
8:30 - 9:15	<b>Lecture 1:</b> Angle-Resolved Photoelectron Spectroscopy  <i>V. Strocov</i>	<b>Lecture 2:</b> Extreme Ultraviolet Lithography  <i>I. Mochi</i>	<b>Lecture 4:</b> Chemical Spectroscopy  <i>O. Safonova, P. Hemberger</i>	<b>Lecture 8:</b> Introduction SmuS  <i>H. Luetkens</i>	<b>Lecture 11:</b> Specialized Talk SwissFEL  <i>K. Schnorr</i>
9:15 -10:00	<b>Virtual Tour 1:</b>  SLS	<b>Lecture 3:</b> X-ray Microscopy  <i>J. Raabe</i>	<b>Lecture 5:</b> Resonant inelastic X-ray scattering  <i>T. Schmitt</i>	<b>Lecture 9:</b> Examples SmuS  <i>Z. Salman</i>	<b>Virtual Tour 3:</b>  SwissFEL
10:00 - 10:30	<i>coffee break</i>	<i>coffee break</i>	<i>coffee break</i>	<i>coffee break</i>	<i>coffee break</i>
10:30-11:15	SLS beamlines practical #1	SLS beamlines practical #2	<b>Lecture 6:</b> Introduction SINQ  <i>C. Niedermayer</i>	<b>Virtual Tour 2:</b>  SINQ	<b>Student Talks I:</b> 3x (10 + 5) min
11:15-12:00			<b>Lecture 7:</b> Examples Neutron Spectroscopy  <i>F. Juranyi</i>	<b>Lecture 10:</b> Introduction SwissFEL  <i>C. Bostedt</i>	<b>Student Talks II:</b> 4x (10 + 5) min  11:15 - 12:15
12:00 - 13:30	<i>lunch break</i>	<i>lunch break</i>	<i>lunch break</i>	<i>lunch break</i>	<i>lunch break</i>
13:30 - 18:00	SLS beamlines practical #1	SLS beamlines practical #2	SINQ Tutorials	Student Talks Preparation	<b>Student Talks III:</b> 3x (10 + 5) min  13:30 - 14:15
					Quiz & Wrap up  14:15 – 15:00

## PLANNING of PRACTICALS at SLS synchrotron

### SESSION A

FACILITY / BEAMLINE	INSTRUCTOR(S)	TITLE	21 March	22 March
SLS / XIL-II	Iacopo Mochi	Extreme ultraviolet ptychography, Lensless imaging of an extreme ultraviolet photomask sample	A1	
SLS / MS	Nicola Casati, Michał Andrzejewski	Materials Science: X-ray Powder Diffraction, High pressure structural evolution		A1
SLS / PEARL	Matthias Muntwiler	Photoelectron Spectroscopy and Diffraction, Composition and Structure of a two-dimensional boron nitride layer	A2	
SLS / PHOENIX	Camelia Borca, Thomas Huthwelker	Micro X-ray Absorption Spectroscopy, Iron spatial distribution and its oxide forms in fluid catalytic cracking particles		A2
SLS / microXAS	Dario Ferreira Sanchez	Two- and Three-Dimensional X-ray micro-XRD and XRF synchrotron, Identifying degradation mechanisms on Solid Oxide Cells through X-ray $\mu$ -XRD and $\mu$ -XRF synchrotron studies	A3	
SLS / SuperXAS	Olga Safonova, Adam Clark	Quick X-ray Absorption Spectroscopy, Evolution of silica supported Cu catalyst during activation in hydrogen		A3
SLS / X-Treme	Jan Dreiser	X-ray absorption spectroscopy (XAS) / X-ray magnetic circular dichroism (XMCD), X-ray magnetic circular dichroism of Fe(II) spin crossover molecules	A4	
SLS / ADDRESS	Vladimir Strocov, Procopios Constantinou	Soft-X-ray ARPES (Angle-Resolved Photoelectron Spectroscopy), What is the Fermi Surface of your Smartphone? Explore electronic structure of semiconductor heterostructures by soft-X-ray ARPES		A4

Please refer to pages 16 – 17 for the nominative list of groups A1, A2, A3, and A4.

## PLANNING of TUTORIALS at SINQ spallation source

### SESSION A

FACILITY / TUTORIAL	INSTRUCTOR	TITLE	23 March
SINQ / HRPT, DMC	Victor Porée	Crystallographic and magnetic structure determination by neutron powder diffraction	W1
SINQ / CAMEA	Daniel Mazzone	Detection of spin-waves in MnF <sub>2</sub> with a continuous angle multiple energy analysis spectrometer	W2
SINQ / Imaging	Anders Kaestner	Root water uptake in soil	W3

## PLANNING of PRACTICALS at SLS synchrotron

### SESSION B

FACILITY / BEAMLINE	INSTRUCTOR(S)	TITLE	21 March	22 March
SLS / TOMCAT	Christian Schlepütz, Margaux Schmeltz	Absorption and phase contrast X-ray tomographic microscopy	B	
SLS / PoLux	Benjamin Watts	Scanning transmission soft X-ray microscopy (STXM), Composition mapping of a thin-film polymer blend		B

## PLANNING of TUTORIALS at SINQ spallation source

### SESSION B

FACILITY / BEAMLINE	INSTRUCTOR	TITLE	23 March
SINQ / SANS	Boyang Zhou	Small-angle Neutron scattering: data reduction and analysis	B

Please refer to pages 16 – 17 for the nominative list of groups / subgroups B, W1, W2, and W3.



online



## PLANNING for MONDAY 21 MARCH

TIME	TITLE	LECTURERS / INSTRUCTOR
09:00 – 9:30	Welcome	Anton Plech, Michael Hagelstein
09:30 – 10:15	Accelerators at KIT	Marcel Schuh, Anke-Susanne Müller
10:15 – 10:30	<i>Break</i>	
10:30 – 11:30	Safety and Radiation Protection	Michael Hagelstein
11:30 – 11:45	<i>Break</i>	
11:45 – 12:30	Beamlines at KIT	Anton Plech / Tilo Baumbach
12:30 – 14:00	<i>Lunch break</i>	
14:00 – 17:30	Hands-on KARA (Karlsruhe Research Accelerator) *	Marcel Schuh
14:00 – 17:30	Hands-on FLUTE (far-infrared linac and test experiment) *	Nigel Smale

\* The participants choose between KARA and FLUTE in the afternoon

## PLANNING for PRACTICALS (and LECTURES) at KIT

DAY	BEAMLINER	TITLE	LECTURERS / INSTRUCTORS
22 March 9:00 – 17:30	TOPOTOMO	X-Ray Microtomography at KARA beamlines and labs	T. van de Kamp, M. Zuber, E. Hamann
23 March 9:00 – 17:30	SCD	High-resolution diffraction and surface sensitive scattering	G. Buth, A. Plech
24 March 9:00 – 17:30	FLUO	Fluorescence spectroscopy of biological materials *	M. Czyzycki, R. Simon
25 March 9:00 – 13:00	LIGA	Deep X-ray lithographical manufacturing of refractive X-ray lenses	M. Börner, H. Fornasier, U. Köhler, A. Last
25 March 14:00 – 18:30	IR1/MPI	<b>Talk on:</b> Infrared ellipsometry of cuprate superconductors at the IR1 Beamline (1 h)	A. Boris, X. Shi
	INE	<b>Talk on:</b> XAFS investigation of zirconium compound at the INE-Beamline (3 h)	T. Vitova, J. Rothe

Each day-long session is finished by a Question & Answer session, where a dialog can be reached between the participants and the lecturers/instructors. The lunch breaks are not indicated in the above schedule. See Hercules website for more information.

All participants stay together (i.e. are not split in groups) during these four days.

\* The practical on Thursday (FLUO) addresses mainly group B participants, but would also be open to A group.

## GENERAL PLANNING for 21 – 25 MARCH

	Monday 21 March	Tuesday 22 March	Wedn. 23 March	Thursday 24 March	Friday 25 March	
9:00 – 9:30	Welcome – SOLEIL (J. Daillant) <i>Auditorium</i>	<b>PRACTICALS on SOLEIL Beam Lines</b>	<b>PRACTICALS on SOLEIL Beam Lines</b>	T. MORENO Calculation of a hard x-rays Beam Line <i>Auditorium</i>	Data Analysis Talk preparation <i>5 rooms booked</i>	
9:30 – 10:30	Visit of the Synchrotron			T. MORENO Calculation of a hard x-rays Beam Line <i>Auditorium</i>	<i>5 rooms booked</i>	
10:30 – 11:00	<i>Coffee break</i>			<i>Coffee break</i>	<i>Coffee break</i>	
11:00 – 12:30	<b>SESSION A</b> C. LAULHE Time-resolved X-ray Scattering <i>Auditorium</i>			<b>SESSION B</b> F. JAMME UV and visible light spectroscopy for biological applications <i>Libra (A2.1.32)</i>	T. MORENO Calculation of a hard x-rays Beam Line <i>Auditorium</i>	Data Analysis Talk preparation <i>5 rooms booked</i>
12:00 – 14:00	<i>Lunch at SOLEIL</i>			<i>Lunch at SOLEIL</i>	<i>Lunch at SOLEIL</i>	
14:00 – 15:30	S. RAVY How light became a wave <i>Auditorium</i>			F. OTT How to build a neutron spectrometer <i>Auditorium</i>	Students presentation and Evaluation Meeting <i>Auditorium</i>	
15:30 – 16:00	<i>Coffee break</i>			<i>Coffee break</i>		
16:00 – 17:30	F. BORONDICS Synchrotron infrared emission and spectroscopic applications <i>Auditorium</i>			Data Analysis Talk preparation <i>5 rooms booked</i>		
18:00 – 19:00	<i>Welcome drink</i> <i>Espace caf��teria</i>					

Additional practical information will be sent by e-mail before the travel of the participants to SOLEIL.

## PLANNING OF PRACTICALS at SOLEIL synchrotron

Please refer to pages 16 – 17 for the nominative list of groups A1, A2, A3, B1, and B2.

### SESSION A

BEAMLINES	INSTRUCTORS	TITLE	22 & 23 March
ROCK CRISTAL	BRIOIS Valérie ELKAIM Erik	Memory effect of Layered Double Hydroxide, by EXAFS and WAXS	A1
GALAXIES DiffAbs	RUEFF Jean-Pascal REGUER Solenn and MOCUTA Cristian	Fingerprinting Mn properties in natural minerals by X-ray spectroscopy and X-ray diffraction	A2
AILES SAMBA	BRUBACH Jean-Blaise FONDA Emiliano	Spin transition in molecular magnets studied by IR THz spectroscopy and XAFS	A3

### SESSION B

BEAMLINES	INSTRUCTORS	TITLE	22 & 23 March
SMIS DISCO LUCIA	SANDT Christophe JAMME Frédéric RIVARD Camille	Liver diseases by integrative synchrotron imaging microcopies	B1
PX1 SWING	MONTAVILLE Pierre THUREAU Aurélien	An integrative pipeline combining microfluidics, SHG microscopy, SAXS and X-ray crystallography to characterize <i>In vivo</i> protein crystallization	B2

► DESY / European XFEL *on site*



## GENERAL PLANNING for 21 – 25 MARCH

### Monday 21 March

TIME	TITLE	LECTURERS / INSTRUCTOR
8:30	Meeting at DESY in front of building 99 (CFEL)	
8:30 – 9:10	Transportation to European XFEL	
9:10 – 9:20	Introduction to European XFEL	Sakura Pascarelli
9:30 – 9:50	Introduction to DESY	Oliver Seeck
9:50 – 10:00	<i>Coffee break</i>	
10:00 – 11:00	Science topics at European XFEL	Sakura Pascarelli
11:00 – 12:00	Science topics at PETRA beamlines	Oliver Seeck
12:00 – 13:00	Tour XFEL	
13:00 – 14:30	<i>Lunch break</i>	
14:30 – 15:00	Tour DESY	
15:00 – 18:00	Practicals at PETRA beamlines / DESY	

### Tuesday 22 March

9:00 – 18:00 Practicals at PETRA beamlines / DESY (continuation)

### Wednesday 23 and Thursday 24 March

9:00 – 18:00 Practicals / Tutorials at European XFEL beamlines

### Friday 25 March

9:00 – 18:00 Talks preparation and presentation

Lunch breaks are not indicated for Tuesday to Friday.  
See Hercules website for more information.

Please refer to pages 16 – 17 for the nominative list of groups A1, A2, A3, and B indicated in the following.



► DESY / European XFEL *on site*



## PLANNING of PRACTICALS at DESY synchrotron SESSION A

Monday 21 March (from 15:00) and Tuesday 22 March (all day)

FACILITY / BEAMLINE	INSTRUCTOR(S)	TITLE	21 & 22 March
DESY / P01	Ilya Sergeev	Nuclear resonant scattering applications	A1
DESY / P08	Florian Bertram and Chen Shen	Surface diffraction at Langmuir films	A2
DESY / P24	Martin Tolkiehn	Single crystal diffraction	A3
DESY / P62	Sylvio Haas	Small angle scattering on nano particles	A4

## PLANNING of TUTORIALS / PRACTICALS at European XFEL SESSION A

Wednesday 23 March

TIME	INSTRUCTOR(S)	TITLE	GROUP(S)
9:00 – 13:00	Anders MADSEN	X-ray Scattering and Imaging Experiments at MID and visit of Instrument	A1
9:00 – 12:00	Ruslan KURTA	Fluctuation X-ray Scattering for Materials Research with an XFEL	A2, A4
9:00 – 12:00	Christian BRESSLER	Virtual Lab - FXE data analysis	A3
14:00 – 15:30	Ulf ZASTRAU	X-ray spectroscopy of Relativistic laser plasmas	A1, A4
16:00 – 17:30	Faisal KOUA, Jayanth KOLIYADU, Raphael DE WIJN	Introduction to X-ray free electron laser for single particle imaging and Serial Femtosecond Crystallography	A1, A4
14:00 – 18:00	Anders MADSEN	X-ray Scattering and Imaging Experiments at MID and visit of Instrument	A2
14:00 – 17:00	Christopher MILNE	Virtual Lab - FXE data analysis	A3

▶ DESY / EuropeanXFEL *on site*

## Thursday 24 March

TIME	INSTRUCTOR(S)	TITLE	GROUP(S)
9:00 – 12:00	Ruslan KURTA	Fluctuation X-ray Scattering for Materials Research with an XFEL	A1, A3
9:00 – 11:30	Valerio CERANTOLA	High pressure science using diamond anvil cells DAC	A2
9:00 – 12:00	Christian BRESSLER	Virtual Lab - FXE data analysis	A4 (with B)
14:00 – 16:30	Valerio CERANTOLA	High pressure science using diamond anvil cells DAC	A1
14:00 – 15:30	Ulf ZASTRAU	X-ray spectroscopy of Relativistic laser plasmas	A2, A3
16:00 – 17:30	Faisal KOUA, Jayanath KOLIYADU, Raphael DE WIJN	Introduction to X-ray free electron laser for single particle imaging and Serial Femtosecond Crystallography	A2, A3
14:00 – 17:00	Christopher MILNE	Virtual Lab - FXE data analysis	A4 (with B)

► DESY / European XFEL *on site*



## PLANNING of PRACTICALS at DESY synchrotron

### SESSION B

Monday 21 March (from 15:00) and Tuesday 22 March (all day)

FACILITY / BEAMLINE	INSTRUCTOR	TITLE	21 & 22 March
DESY / P11	Johanna Halanpaeae	Macromolecular crystallography	B

## PLANNING of PRACTICALS / TUTORIALS at European XFEL

### SESSION B

Wednesday 23 March

TIME	INSTRUCTOR(S)	TITLE	GROUP
9:00 – 10:30	Faisal KOUA, Jayanath KOLIYADU	Introduction to X-ray free electron laser Structural Biology	B
11:00 – 13:00	Kristina LORENZEN	Growing and Characterisation of Micro-crystals and Sample Injection for Serial Femtosecond Crystallography	B
14:00 – 17:00	Ruslan KURTA	Fluctuation X-ray Scattering for Biological Structure Determination with an XFEL	B

Thursday 24 March

TIME	INSTRUCTOR(S)	TITLE	GROUP
9:00 – 12:00	Christian BRESSLER	Virtual Lab - FXE data analysis	B (with A4)
14:00 – 17:00	Christopher MILNE	Virtual Lab - FXE data analysis	B (with A4)

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