User laboratories for sample preparation

Joachim Schulz
Some considerations

- Samples/targets are often the key to a good experiment
- Users are experts in preparing their samples
- Usually users will bring their own samples
- European XFEL will provide user laboratories for:
  - Modifications of samples during beamtime
  - Just-in-time production of volatile samples
  - Inspection of samples before and after the experiment
- Some of these tasks are time critical
  - Can become necessary in the middle of the night
  - This makes it impractical to go to e.g. DESY
- Access to the laboratories will be granted together with beamtime
19\textsuperscript{th} January 2016
User laboratories for sample preparation

Entering the European XFEL Facility

To the instruments

User office

Reception
The experimental hall (XHEXP1)

User laboratories for sample preparation

SPB/SFX sample lift into the preparation laboratory

Lift to laboratories and offices

Staircases to laboratories and offices

Lift to laboratories

SCS

SQS

SPB /SFX

FXE

SASE 1

SASE 3

SASE 2

MID

HED

SPB/SFX sample lift into the preparation laboratory
User laboratories for sample preparation

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Joachim Schulz, Group Leader Sample Environment, European XFEL GmbH
User laboratories for sample preparation

Biology

Open preparation laboratory area

- Cell cultures
- Purification
- Crystallization
- Quality control
- Test of sample injection
- Space for data analysis

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The XBI user consortium

- Will be founded by initially 7 members:
  - Arizona State University, Slovak Academy of Science, EMBL, University of Hamburg, University Hospital of Hamburg, University of Oulu, Uppsala University
- Provides most of the biology laboratory infrastructure
- Supports users in the whole process from cell culture to data analysis
User laboratories for sample preparation

User laboratory areas

XBI user consortium & XFEL.EU Biology Laboratories
Sample lift

User Labs
Non-biology user laboratories

User laboratories for sample preparation

You'll probably come from here

Chemistry

X-rays

User sample preparation

Scanning electron microscopy

Chemistry
User laboratories for sample preparation

User sample preparation

Equipment
- Laboratory benches
- Optical microscopes
- Confocal microscope
- Vacuum chambers
- Glove box
- Staging area for large user equipment

Typical tasks
- Clean mounting of samples into frames
- Sample characterization
- Damage control after the experiment
- Test of user equipment
- Integration into the Karabo control system
User laboratories for sample preparation

Chemistry

**Chemistry room**
- Two fume cabinets
- Equipped for hydrofluoric acid
- Wet chemical sample preparation
- Possibility for mirror cleaning

**Dark room**
- Another fume cabinet
- Equipped for handling light sensitive samples

It’s impossible to be prepared for everything!
Please contact us when you have special requirements.
Two rooms are prepared for SEMs.

**Environmental SEM**
- Test & development of liquid jets
- Inspection of wet samples
- Fast pump cycles

**Dual beam SEM with focussed ion beam (FIB)**
- Surface science
- Edging and depositing of calibration and reference patterns
**User laboratories for sample preparation**

**X-ray laboratory**

**X-ray generators**
- Powder diffractometry
- SAXS
- Rocking curves of mirrors and crystals
- Photoelectron spectroscopy

**Sample development**
- Quality control

**Room for up to three devices**
The team

WP79 Sample Environment

Contacts
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Kristina Lorenzen for biology
James Moore for magnetism
Prasad Thute for SPB/SFX
Joachim Schulz for everything

User office
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Conclusions

- We prepare user laboratories for
  - sample preparation
  - test of user equipment
  - quality control
- Biology laboratories will be equipped and operated by the XBI user consortium in cooperation with the sample environment group
- Special laboratories for
  - Chemistry
  - Scanning electron microscopy
  - X-ray equipment
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