



# Welcome to the 2019 European XFEL Users Meeting the 13<sup>th</sup> Users Meeting

Robert Feidenhans'l  
Managing Director,  
Schenefeld/Bahrenfeld, 23 January 2019

## Nicole Elleuche new Managing and Administrative Director Maria Faury new Council Chair



■ Nicole Elleuche comes from the Heinrich Pette Institute, Leibniz-Institute for Experimental Virology, Hamburg



■ Maria Faury has an engineering background and is Director of International Affairs and Large Research Infrastructures of the Fundamental Research Division at the CEA

## 2019 is a special Year : Signature of Convention 30 november 2009



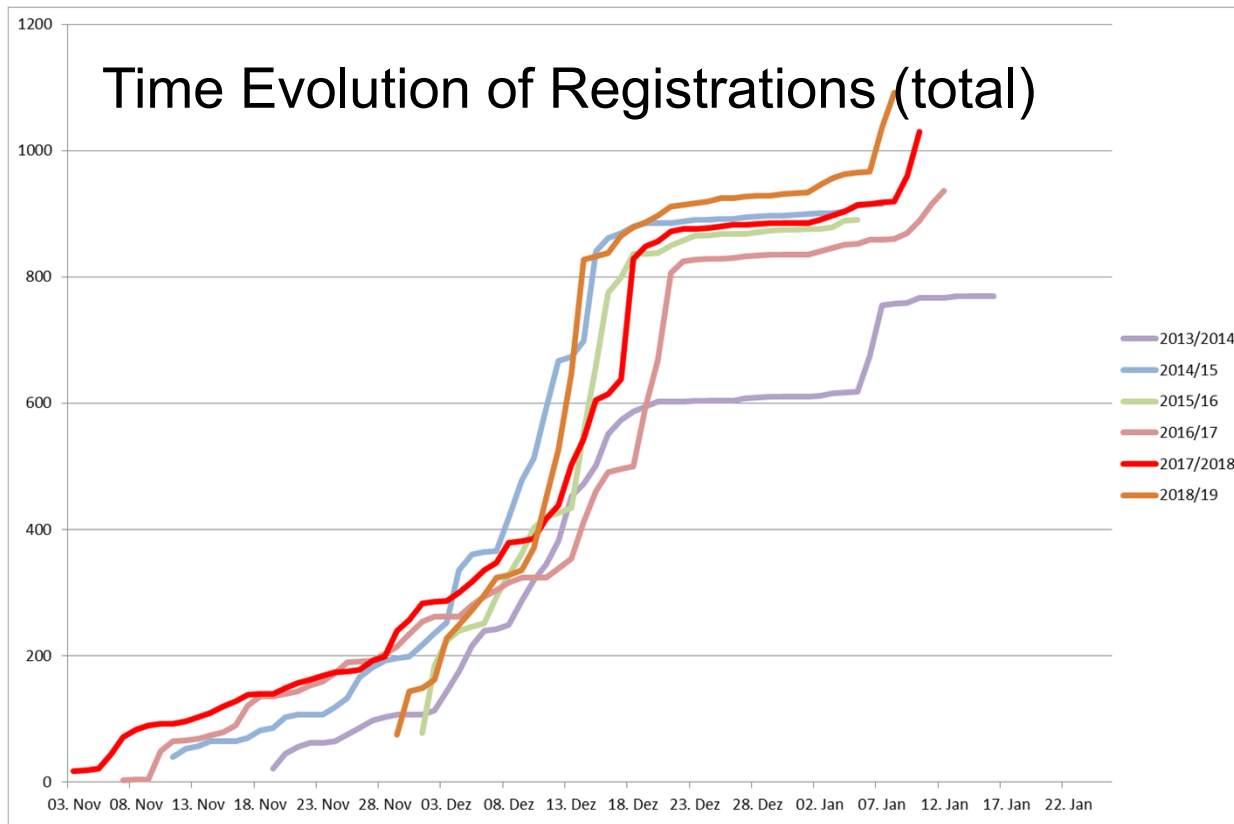
## 2019 Users Meeting:

- 1090 Registered Participants
- 362 Posters
- 83 industrial vendors
- 5 Satellite meetings

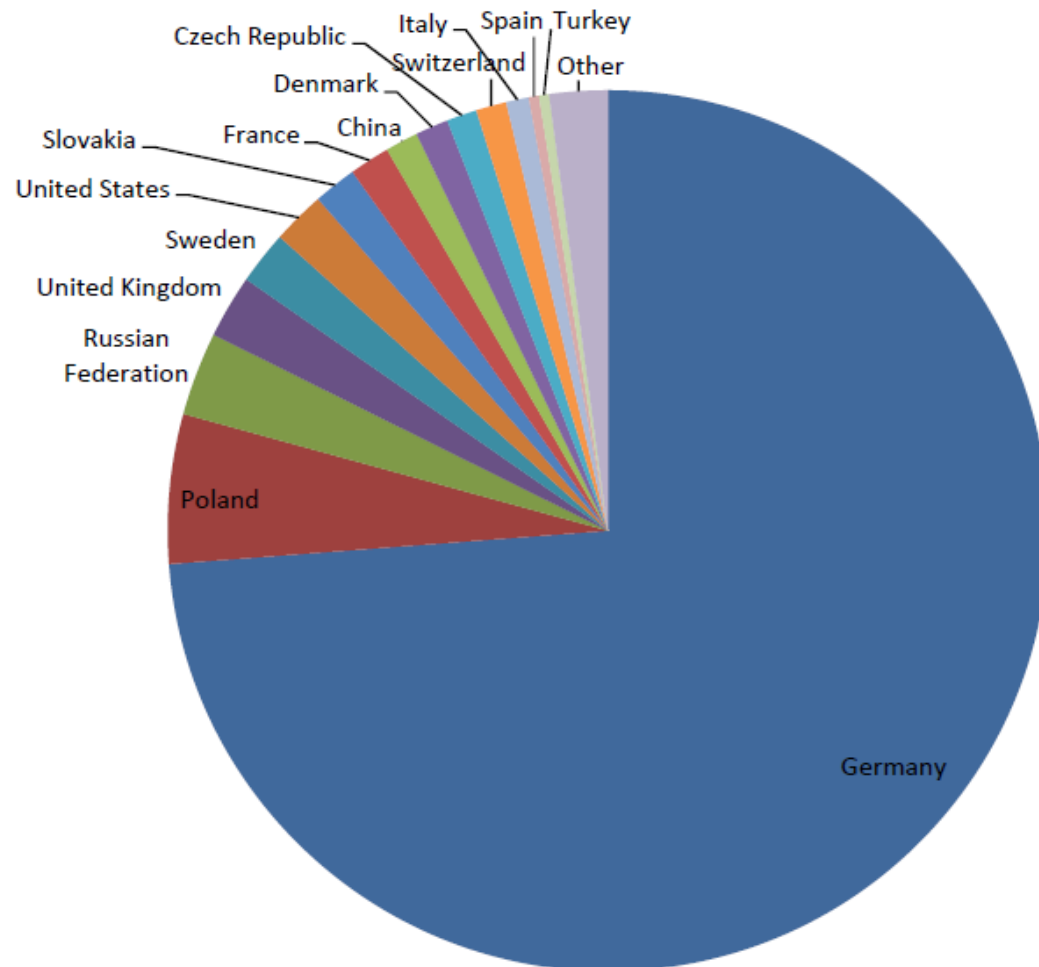


24-26 January 2018: Record attendance at first users' meeting since European XFEL operation began.

Year	2013/2014	2014/15	2015/16	2016/17	2017/2018	2018/19
Total on-line	769	916	891	937	1030	1090



Country	Number
Germany	794
Poland	59
Russian Federation	33
United Kingdom	25
Sweden	21
United States	21
Slovakia	17
France	16
China	13
Denmark	13
Czech Republic	12
Switzerland	12
Italy	9
Spain	4
Turkey	4
Other	23





## Two important Directors are leaving us /stepping down



26 October 2018

Andreas Scherz

Scientific Director European XFEL

**Thank you for all contributions and efforts**



31 December 2018:  
Reinhard Brinkmann  
Machine Director  
DESY

# Content

- Users statistics and first publications
- Status SASE 1 (SPB/SFX , XBI and FXE, see talk by A. Orville, M. Chergui, S. Canton, F. Lehmkuhler K. Lorenzen)
- Status accelerator (Winni Decking)
- Progress SASE3 and SASE2 ( see talks M. Meyer, A. Scherz, A. Madsen)
- Shaping the Future (Serguei Molodtsov)
- Organisation
- Canteen and Guesthouse
- Conclusion



# Users and First Publications

## First users – 14 September 2017



Where are we today?

**Four months from first lasing to user operation !**

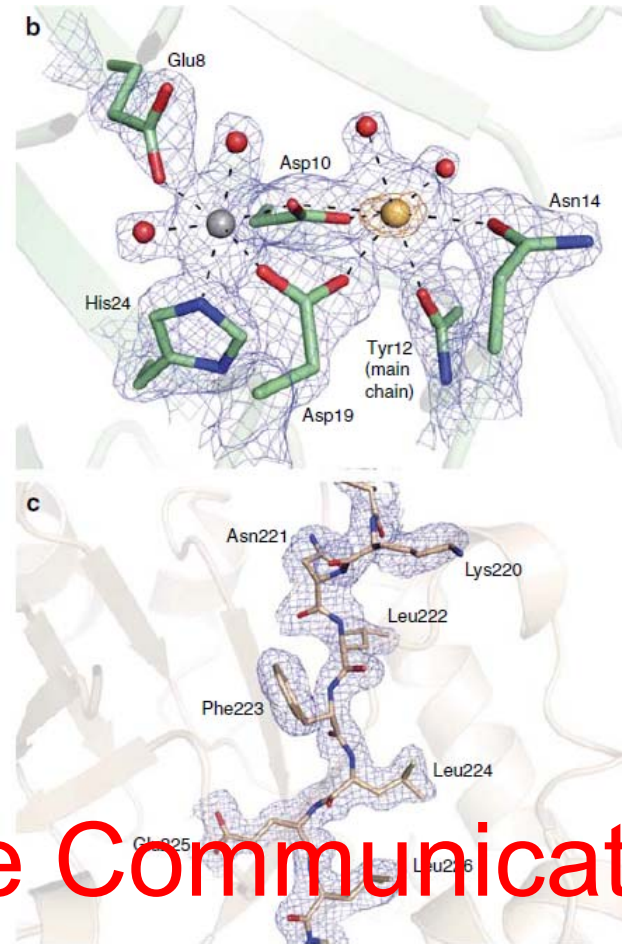
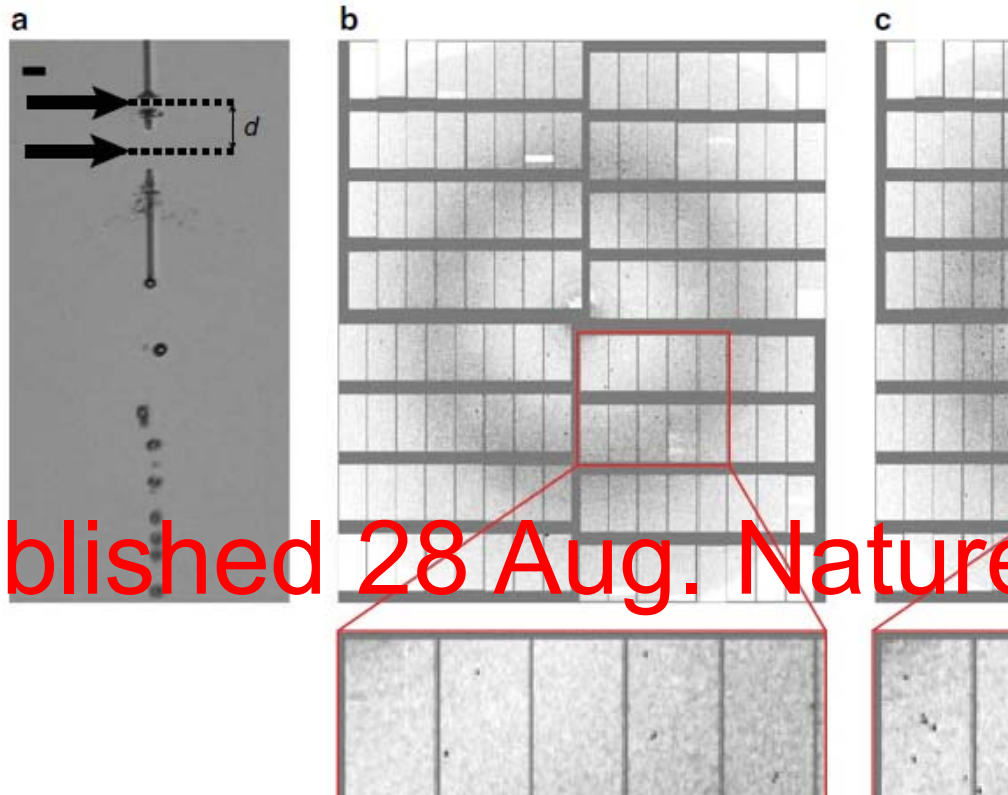
## Proposal for SPB/SFX and FXE in the first three rounds

	First Proposal Round	Second Proposal Round	Third Proposal Round	Fourth Proposal Round
Proposals submitted SPB/SFX and FXE	63	61	75	61
Total proposers	505	440	576	
User shifts requested (12 hours/shift)	275	341	341	
Proposals submitted to FXE	37	42	44	33
Proposals submitted to SPB/SFX	26	19	31	28
Proposals allocated beamtime on FXE	7	6	6	
Proposals allocated beamtime on SPB/SFX	7	6	7	

PRP Feb. 20/21

# Megahertz data collection from pro microcrystals at an X-ray free-electron laser

Marie Luise Grünbein<sup>1</sup>, Johan Bielecki<sup>2</sup>, Alexander Gorel<sup>1</sup>, Miriam Stricker<sup>1</sup>, Marco Cammarata<sup>3</sup>, Katerina Dörner<sup>2</sup>, Lars Fröhlich<sup>4</sup>, Elisabeth Hartmann<sup>5</sup>, ...



Published 28 Aug. Nature Communication



## SPB/SFX experiment #2012: Many thousands of frames of diffraction data was collected and successfully analysed to give a structure!

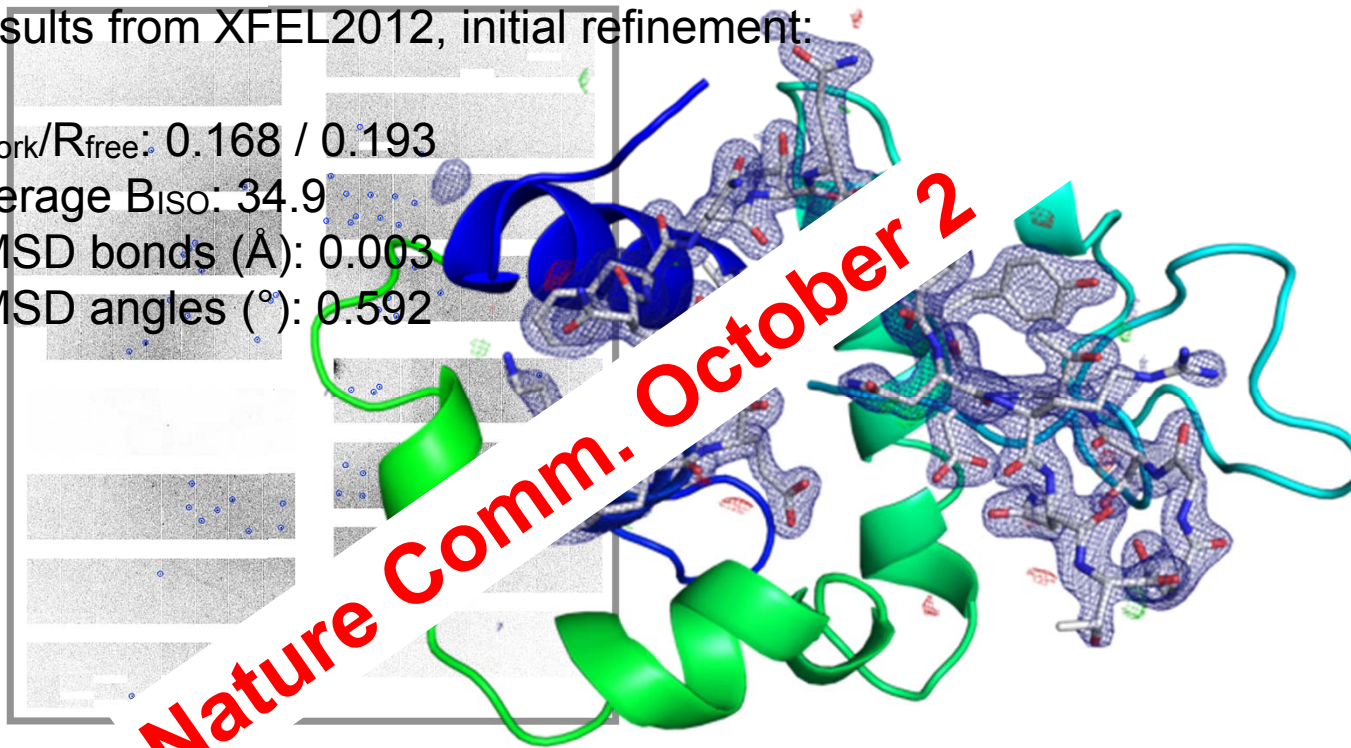
Results from XFEL2012, initial refinement:

$R_{\text{work}}/R_{\text{free}}$ : 0.168 / 0.193

Average  $B_{\text{iso}}$ : 34.9

RMSD bonds (Å): 0.003

RMSD angles (°): 0.592



- This is the first realisation of the European XFEL's purpose—a complete experiment from start-to-end demonstrated in the very first user experiment at the facility at the SPB/SFX instrument (Data September 2017, Analysis November 2017). That is, structural biology works at XFEL!



## AGIPD at SPB/SFX : Adaptive gain detector

The image is a composite of three parts. On the left, a diagram titled "European XFEL pulse structure" shows a series of three vertical pulse trains. The first pulse train has a duration of  $600 \mu\text{s}$ . The time between the start of the first and second pulse trains is  $99.4 \text{ ms}$ . The diagram uses double slashes to indicate a break in the timeline. In the center, a photograph shows the AGIPD detector assembly, which consists of a stack of 352 frames, with the text "352 frames" overlaid. On the right, a photograph shows the detector in a cleanroom environment, with a person in a blue cleanroom suit visible. The AGIPD logo is overlaid on the right side of the cleanroom photo.



# Progress as a function of time on instruments

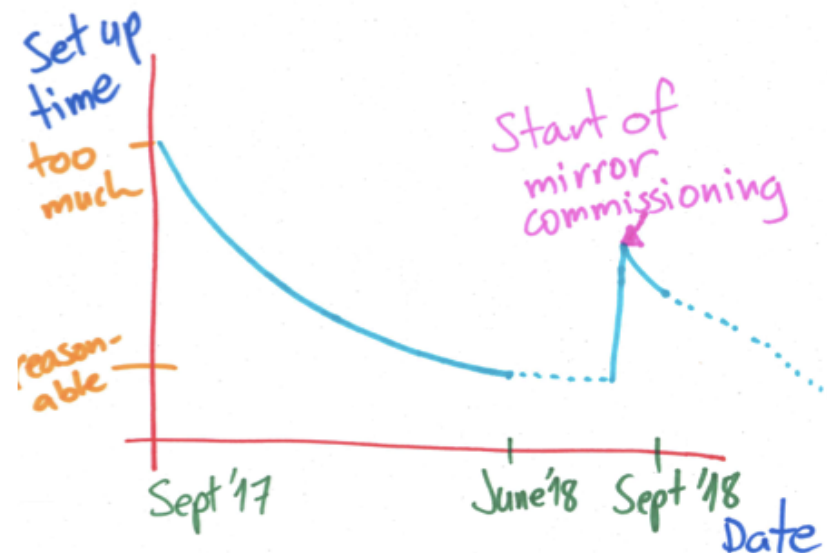
The SPB/SFX Instrument: Performance and perspectives

Adrian Mancuso, SAC Meeting of the European XFEL, September 2018

X

- Instruments have a high degree of complexity
- High work load on staff
- Significant set up time for experiments
- Key instrumentation still needs to be commissioned
- Mitigating support for instruments by careful planning

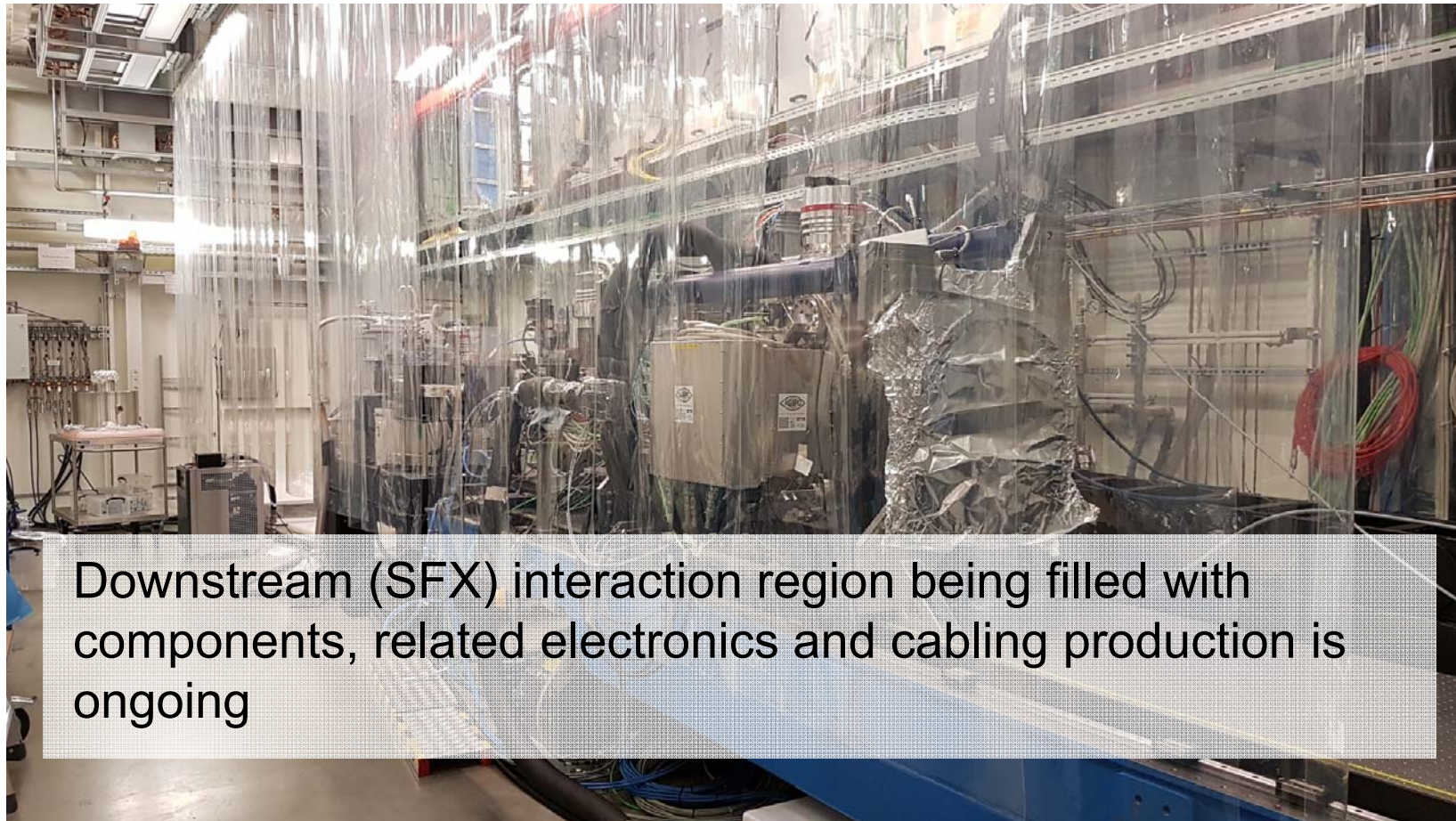
## Progress as a function of time (qualitative)



European XFEL

Courtesy Adrian Mancuso

## 2 November 2018 – SPB experiment



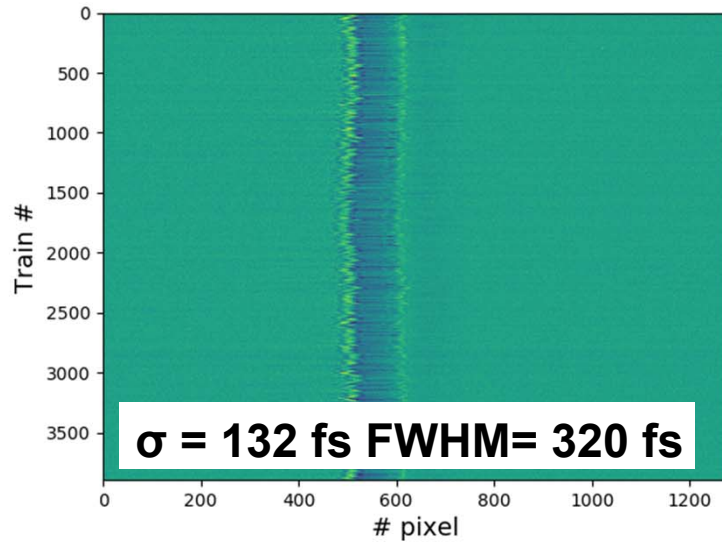
Downstream (SFX) interaction region being filled with components, related electronics and cabling production is ongoing

# FXE : X-ray – Optical Laser sync performance

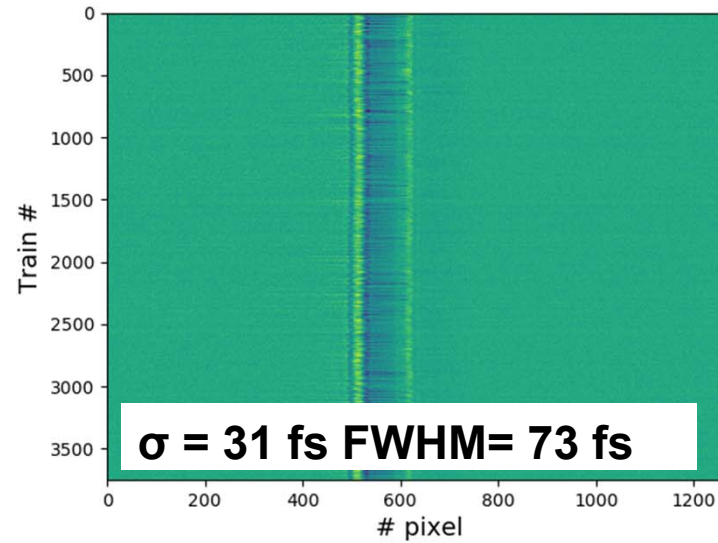
single shot @ 564 kHz detector frame rate



RF synchronized,  
Inter train run 447



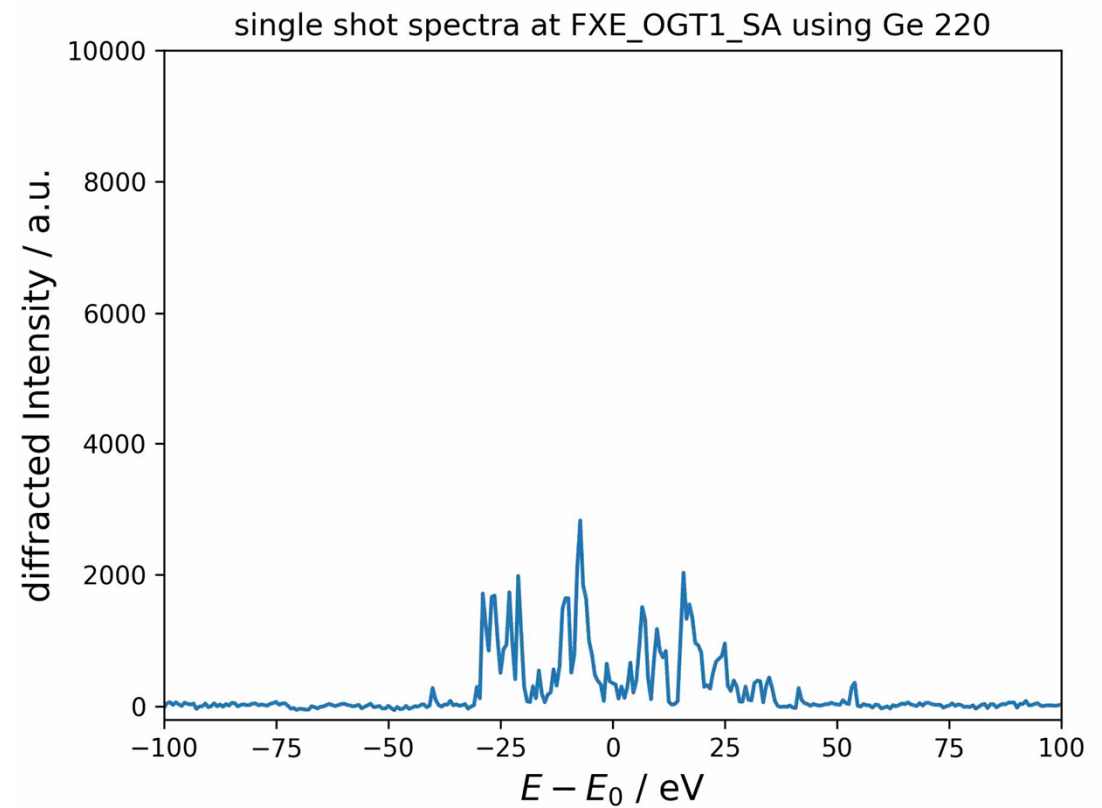
Optically synchronized,  
Inter train run 447



## Single Shot spectrum Analyzer at FXE

single shot @564 kHz detector frame rate on a 1.1 MHz x-ray  
pulse repetition rate

10 trains, 30 pulses each





## Proposals statistics all 6 instruments

Number of proposals 3rd and 4th proposal round

	<b>FXE</b>	<b>SPB/ SFX</b>	<b>SQS</b>	<b>SCS</b>	<b>MID</b>	<b>HED</b>
Run III	44	31	17	13	21	13
Run IV	33	28	10	8	17	13

## Third Proposal Round, Nov 2018 – June 2019

### Distribution of shifts

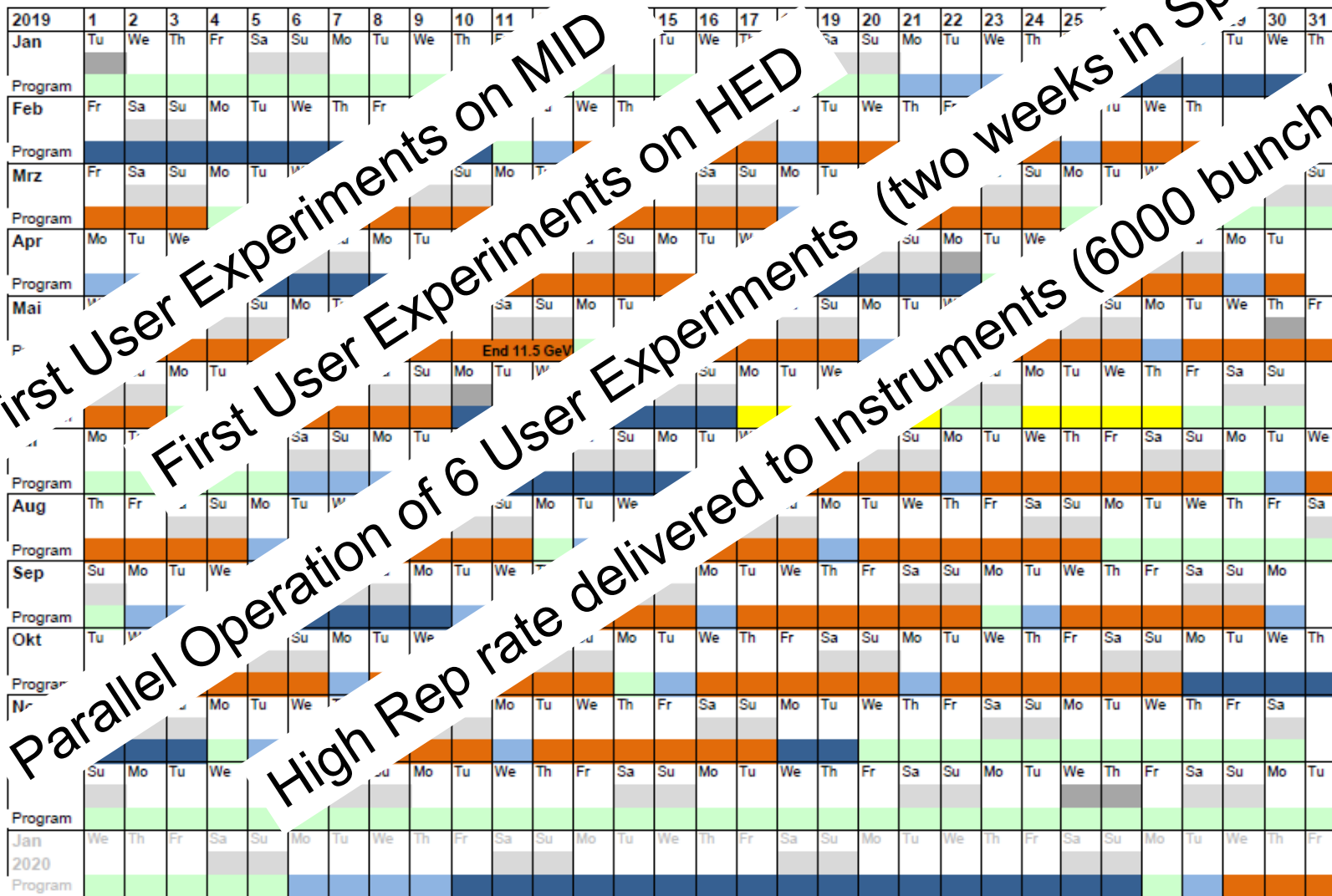
	#Use Exp	User	Com/IU/Setup
FXE	6	26	73
SPB/SFX	7	27	72
SQS	8	43	58
SCS	8	43	58
MID	5	25	53
HED	4	20	58

Management Contingency : 2 shifts on FXE/SPB for Hercules winterschool



Outline Annual Operation Schedule 2019 (FINAL-2, 28/08/2018)

Legende:  Weekend  Bank holiday  Scheduled down  RP  ST  FD  XP



First User Experiments on MID

First User Experiments on HED

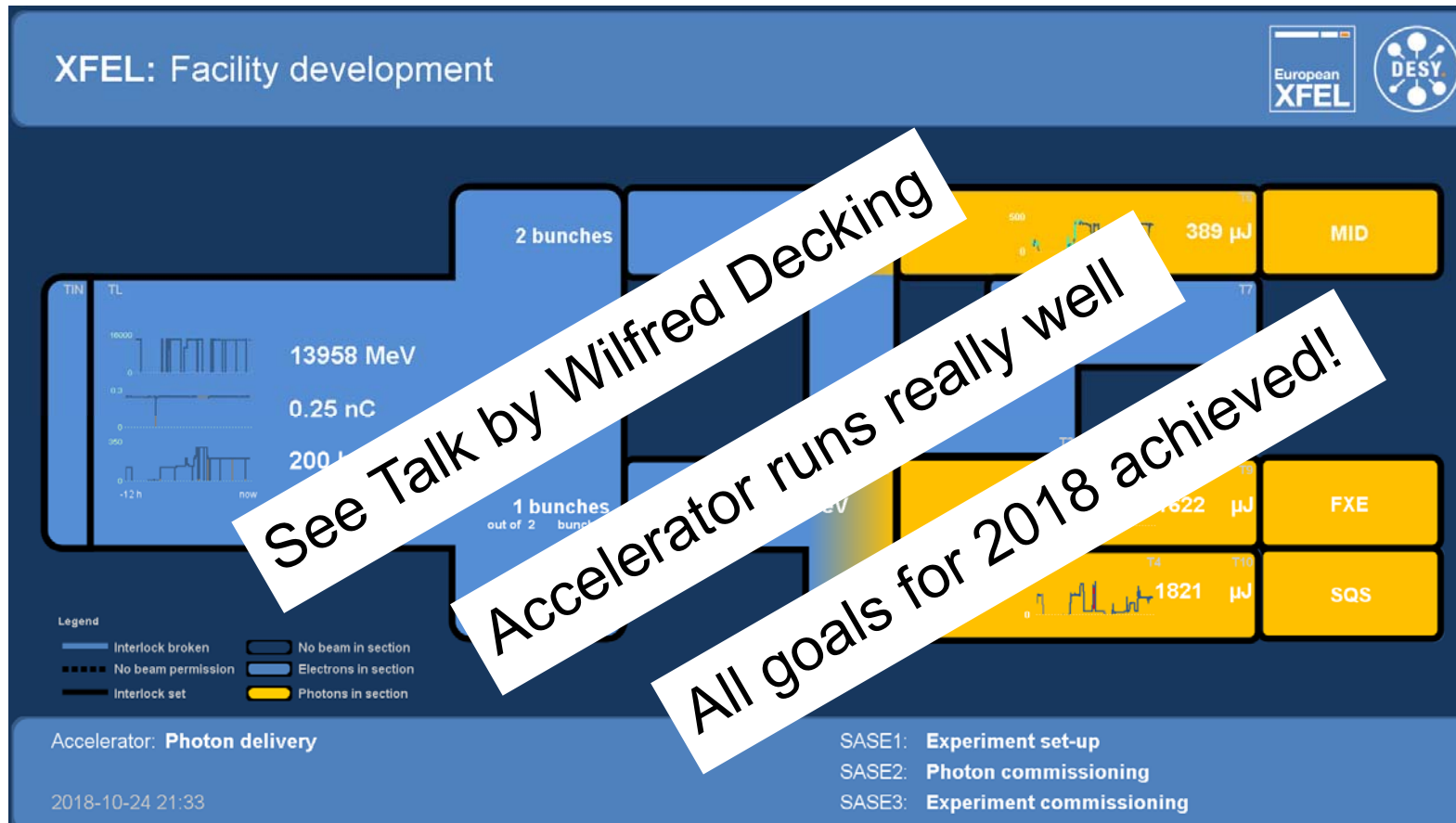
Parallel Operation of 6 User Experiments (two weeks in Spring)

High Rep rate delivered to Instruments (6000 bunch/s)

RP Radiation protection  
 ST Setup, access, tuning  
 FD Facility development  
 XP X-ray program

The X-ray program  
 Includes external (user) and  
 internal commissioning and  
 other internal use

# Status : Parallel Operation of all three Undulators!



See Talk by Wilfred Decking  
Accelerator runs really well  
All goals for 2018 achieved!

operation:  
3 SASE FELs  
3 photon beamlines  
2 experiments  
commissioning:  
4 experiments



**First User Experiments on SCS and SQS**

**See talk by Micheal Meyer**

**See talk by Andreas Scherz**



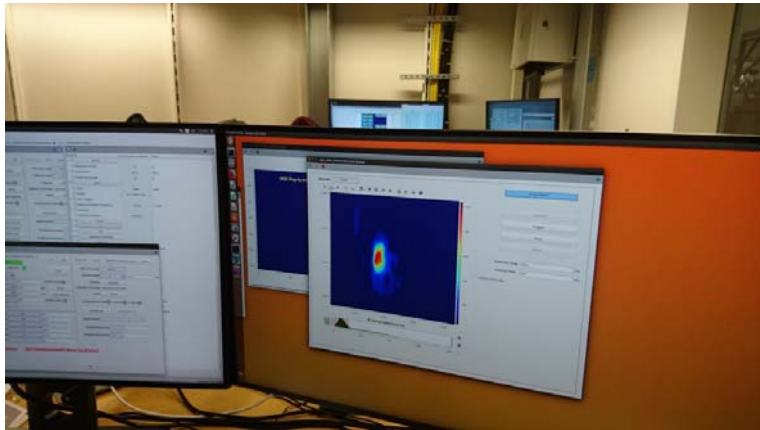
5 December 2018: First user experiment at SCS



November / December 2018: First user groups SQS

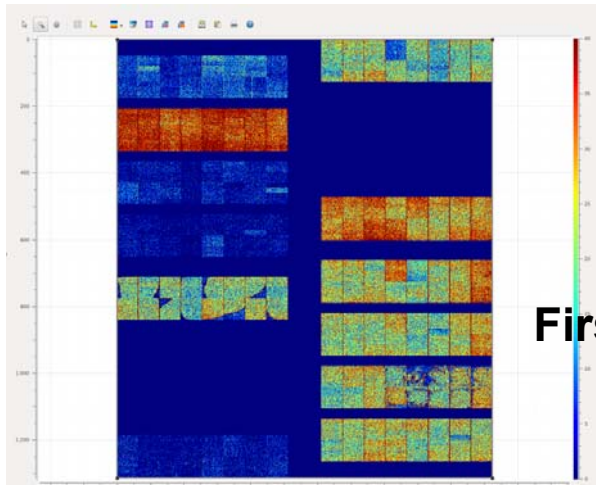


## First beam in Hutch at MID : December 7



See talk by Anders Madsen

First Users in March



First Image on AGIPD Detector Dec 8

## 02.11.2018 – HED experiment





# innels

## Workshop

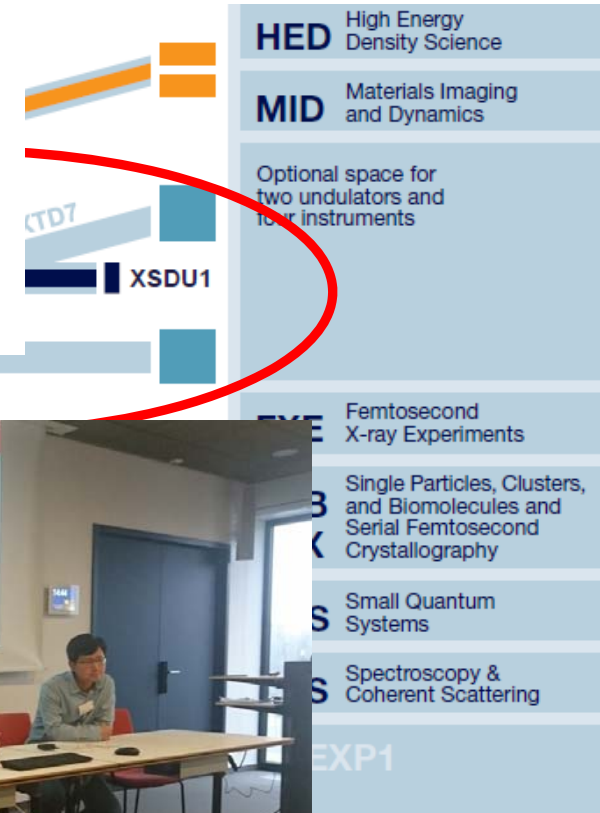
### “Shaping the Future of the European XFEL: Options for the SASE4/5 Tunnels”

06 December – 07 December 2018

Venue: Room E1.173 - European XFEL/S-

Scope of the Workshop: Analysis and discussion of possibilities for mid-term upgrades of the two empty tunnels of the SASE4/5

Talk by Serguei Molodtsov



SE 1  
nm - 0.4 nm



# Organisational Matter

# New Orga-Chart Line Management

**Management Board**

Robert Feidenhans'l (Chairman, Managing Director)  
Nicole Elleuche (Managing Director)

Serguei Molodtsov (Scientific Director)  
N.N (Scientific Director)  
Thomas Tschentscher (Scientific Director)

MB Office

Disting. Advisor

**Administration**  
Managing Director  
N. Elleuche

**Experiments B**  
Scientific Director  
NN, S. Molodtsov,

**Operation & Development**  
Scientific Director  
T. Tschentscher

Internal Audit

Safety & Radiation Protection

Industrial Liason Office

Press & Public Relations

Finance/Controlling  
Grant office

Human Resources

Legal Group

Procurement/  
Logistics

Library

Asset Management

User Office

FXE

HED

MID

SPB/SFX

SQS

SCS

Theory

Simulation of Photon  
Fields

Sample Environment

Soft X-ray Port

Science Support  
Instrumentation  
Department

Central Mechanical  
Engineering

X-ray Optics

X-ray Diagnostics

Vacuum

Optical Lasers

Undulators

Technical Services

Project Management  
Office

Photon System  
Operation incl.  
HallCrew

Science Support  
Data  
Department

Detector

Control

Electronics

ITDM

Scientific  
Computing/ Data  
Analysis

SAC

MAC



# Italy and UK are now full shareholders



05 October 2018: Italy new shareholder



21 November 2018: UK new shareholder

## ■ Civil construction projects Canteen

- XHC opens in April
- Operator starts test run in February 2019
- 30 x 20 m in the base area, 150 seats

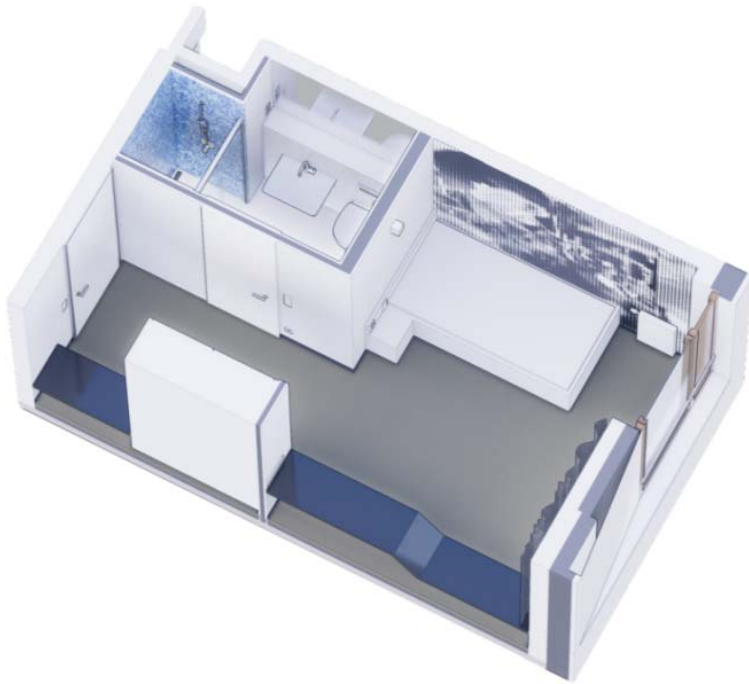


# BEAM STOP

European XFEL

■ Civil construction projects:

■ **XHG (Construction start Summer)**





# It has (again) been a fantastic Year



06 August 2018: Our plaza in Schenefeld



## Acknowledgement to the fantastic staff at European XFEL



## And to the fantastic Accelerator Staff

