

## Workshop

# “New Scientific Capabilities at European XFEL”

25 March – 27 March 2019  
Venue: DESY Auditorium

### 25 March 2019

#### Registration

08:30 – 09:15 Registration (Foyer Auditorium, Building 5)

09:15 – 09:20 Welcome

#### Session I: “Hard X-ray science I”

*Chair: Martin Meedom Nielsen*

09:20 – 09:45 Henning Friis Poulsen (DTU)  
“An ultrafast hard x-ray multiscale microscope”

09:45 – 10:10 Bo Brummersted Iversen (Uni Aarhus)  
“Dynamic crystallography”

10:10 – 10:35 Marion Harmand (Sorbonne University)  
“Hard x-ray FEL for matter under extreme conditions”

**10:35 – 10:50 Coffee Break**

#### Session II: “Hard X-ray science II – MHz imaging & diffraction”

*Chair: Martin Meedom Nielsen*

10:50 – 11:15 Alexander Rack (ESRF)  
“MHz hard x-ray imaging at the ESRF”

11:15 – 11:40 Bjoern Winkler (Uni Frankfurt)  
“Ultrafast diffraction to understand reactions and phase transformations using hard or ultra-hard x-rays”

11:40 – 12:05 Paul Kamm (HZB)  
“Dynamic processes in metal foam”

12:05 – 12:45 Discussion (“hot” slides from audience are welcome)

**12:45 – 14:20 Lunch**

### **Session III: “Coherent imaging & Use of longitudinal coherence”**

*Chair: Jochen Schneider*

- 14:20 – 14:45 Ralf Röhlsberger (DESY)  
“Scientific opportunities with an x-ray free-electron laser oscillator”
- 14:45 – 15:10 Ivan Vartanyants (DESY)  
“From coherent to ghost imaging at XFEL sources”
- 15:10 – 15:35 Jörg Evers (MPIK Heidelberg)  
“Nuclear quantum optics at XFELs”
- 15:35 – 16:15 Discussion
- 16:15 – 16:45 Coffee Break**

### **Session IV: “Chemistry & Catalysis”**

*Chair: Andreas Stierle*

- 16:45 – 17:10 Anders Nilsson (Uni Stockholm)  
“Probing surface catalysis in real time using soft x-rays”
- 17:10 – 17:35 Oliver Gessner (LBNL)  
“Ultrafast x-ray studies of chemical and interfacial dynamics”
- 17:35 – 18:00 Grigory Smolentsev (PSI)  
“Pump-probe x-ray spectroscopy and scattering to study  
OLED materials and molecular catalysts”
- 18:00 – 18:40 Discussion
- 18:40 – 21:00 Dinner (DESY Bistro & Canteen)**

**26 March 2019**

### **Session V: “Magnetism & Correlated materials”**

*Chair: Massimo Altarelli*

- 09:00 – 09:25 Steven Johnson (ETH Zurich)  
“Possibilities for frequency and time-domain spectroscopy  
of Floquet states in quantum materials”
- 09:25 – 09:50 Hermann Dürr (Uni Uppsala)  
“Towards coherent control of quantum materials”
- 09:50 – 10:15 Stefano Bonetti (Uni Stockholm)  
“THz dynamics of quantum materials”
- 10:15 – 10:55 Discussion
- 10:55 – 11:10 Coffee Break**

## **Session VI: “Attosecond experiments”**

*Chair: Edgar Weckert*

- 11:10 – 11:35      Francesca Calegari (Uni Hamburg / DESY)  
“Attosecond science of complex molecules: perspectives at FELs”
- 11:35 – 12:00      James Cryan (SLAC)  
“Using attosecond XFELs to probe ultrafast electron dynamics”
- 12:00 – 12:25      Thomas Pfeifer (MPIK Heidelberg)  
“Watching and steering electrons with intense optical  
and free-electron lasers”
- 12:25 – 13:05      Discussion
- 13:05 – 14:15      Lunch**

## **Session VII: “Non-linear phenomena”**

*Chair: Jan-Erik Rubensson*

- 14:15 – 14:40      Nina Rohringer (Uni Hamburg / DESY)  
“Perspektives of multi-colour nonlinear x-ray Raman scattering with  
high-brilliance x-ray sources”
- 14:40 – 15:05      Claudio Masciovecchio (FERMI)  
“FEL based nonlinear spectroscopy”
- 15:05 – 15:30      Nora Berrah (Uni Connecticut)  
“Investigating dynamics with soft x-ray FELs”
- 15:30 – 16:10      Discussion
- 16:10 – 17:00      Transfer to EuXFEL**
- 17:00 – 18:30      EuXFEL Tours**
- 18:30 – 21:00      EuXFEL Reception**  
(A bus to DESY with an intermediate stop at Mercure Hotel  
will departure from EuXFEL at 21:00)

**27 March 2019**

## **Session VIII: “Structural biology applications”**

*Chair: Aymeric Robert*

- 08:30 – 08:55      Anton Barty (CFEL / DESY)  
“Structural biology possibilities for tunnels 4 and 5”
- 08:55 – 09:20      Poul Nissen (Uni Aarhus)  
“Structure and dynamics of biomembranes and membrane proteins”
- 09:20 – 09:45      Jim Naismith (Uni Oxford)  
“SPB/SFX lessons for the future”
- 09:45 – 10:25      Discussion
- 10:25 – 10:40      Coffee Break**

## **Session IX: “Relaxation dynamics in strong fields”**

*Chair: Jochen Küpper*

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|----------------------|---|
| 10:40 – 11:05        | Kiyoshi Ueda (Uni Tohoku)<br>“AMO from 10 eV to 100 keV: Molecular movie and beyond”                                |
| 11:05 – 11:30        | Robert Moshhammer (MPIK Heidelberg)<br>“Ultrafast atomic and molecular dynamics -<br>new capabilities at EuXFEL !?” |
| 11:30 – 11:55        | Edwin Kukk (Uni Turku)<br>“Coulomb explosion of highly charged small quantum systems -<br>simple or not so simple?” |
| 11:55 – 12:35        | Discussion  |
| <b>12:35 – 13:45</b> | <b>Lunch</b>  |

## **Session X: “Time-resolved & precision spectroscopy”**

*Chair: Wolfgang Eberhardt*

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|----------------------|---|
| 13:45 – 14:10        | José Crespo (MPIK Heidelberg)<br>“70-keV-hard bound-state quantum electrodynamics and<br>soft x-ray purely photo-ionized low-density plasmas at XFEL”             |
| 14:10 – 14:35        | Ryan Coffee (LCLS)<br>“Opining on a future for multi-color soft x-ray spectroscopy in<br>correlation with few femtosecond time-resolved hard x-ray<br>scattering” |
| 14:35 – 15:00        | Kevin Prince (FERMI)<br>“Ultrafast dynamics and high resolution spectroscopy of molecules”  |
| 15:00 – 15:40        | Discussion  |
| <b>15:40 – 15:50</b> | <b>Close-out</b>  |