



“Theory meets XFELs 2025”

(program ver. 18.11.2025)

26 November 2025: European XFEL, Schenefeld, Germany

27-28 November 2025: CFEL, DESY, Hamburg, Germany

WEDNESDAY, 26 November 2025

Auditorium, Lighthouse visitor center, European XFEL, Schenefeld

09:00 – 09:45	Registration (Lighthouse Foyer, in front of the Auditorium)
09:45 – 10:00	Welcome
Session 1: (10:00 – 13:00)	<i>Ultrafast electron dynamics – Towards attosecond solid state physics</i> (Chairs: Andreas Scherz and Vladimir Lipp)
10:00 – 10:30	Martin Eckstein (University of Hamburg) <i>Time-resolved X-ray spectroscopy on correlated materials: Insights from non-equilibrium DMFT and beyond</i>
10:30 – 11:00	Maurits Haverkort (Heidelberg University) <i>From molecules to correlated solids, using non-linear response theory to describe electron dynamics</i>
11:00 – 11:30	Coffee Break
11:30 – 12:00	Tim Wehling (University of Hamburg) <i>Harnessing the electron-nuclear interplay: Charge density waves and ultrafast quantum geometric effects</i>
12:00 – 12:30	Ichiro Inoue (University of Tokyo and RIKEN) <i>Diffraction and spectroscopy with attosecond hard X-ray pulses</i>
12:30 – 13:00	Discussion
13:00 – 14:00	Lunch Break
14:00 – 15:00	Guided Tour through the European XFEL Experimental Hall



Session 2: *Ultrafast structural dynamics – Phase transitions and lattice dynamics* (Chairs: Chris Milne and Ruslan Kurta)
(15:00 – 18:00)

15:00 – 15:30 **Claudia Draxl** (Humboldt University of Berlin)
Ab initio approaches to excitation dynamics

15:30 – 16:00 **Mariana Rossi** (MPI for the Structure and Dynamics of Matter)
Simulating the structure and dynamics of weakly-bonded materials from first principles

16:00 – 16:30 Coffee Break

16:30 – 17:00 **Martin Garcia** (University of Kassel)
When materials reshape and proteins fold: Thermal and nonthermal ultrafast ion dynamics in condensed matter

17:00 – 17:30 **Kai Rossnagel** (Kiel University)
Ultrafast unordering of electron-lattice order

17:30 – 18:00 Discussion

18:00 – 21:00 **Reception @ European XFEL**

THURSDAY, 27 November 2025

CFEL Seminar rooms I-III, CFEL (Building 99), DESY, Hamburg

Session 3: *Ultrafast spin dynamics – Magnetism, transport and topological effects* (Chairs: Anders Madsen and Alexander Lichtenstein)
(09:00 – 12:00)

09:00 – 09:30 **Konrad Kapcia** (Adam Mickiewicz University)
Theoretical description of femtosecond X-ray induced magnetization dynamics and electronic processes in ferromagnets

09:30 – 10:00 **Bärbel Rethfeld** (RPTU University Kaiserslautern-Landau)
Spin-resolved non-equilibrium electron dynamics in magnetic materials

10:00 – 10:30 Coffee Break

10:30 – 11:00 **Mikhail Katsnelson** (Radboud University)
Mysteries of light rare earths: intrinsic spin glassiness in Nd and nonmagnetic state of Pr

11:00 – 11:30 **Uwe Bovensiepen** (University of Duisburg-Essen)
Ultrafast X-ray absorption spectroscopy: Challenges and opportunities

11:30 – 12:00 Discussion

12:00 – 14:00 **Lunch Break**



Session 4: *Strong-field phenomena – Nonlinear X-ray matter interaction and spectroscopy* (Chairs: Michael Martins and Konrad Kapcia)
(14:00 – 17:00)

- 14:00 – 14:30 **Olga Smirnova** (Max Born Institute)
Spin-chirality coupling without magnetic fields
- 14:30 – 15:00 **Joshua Kas** (University of Washington)
Real-space multiple scattering theory of non-resonant two-photon X-ray absorption
- 15:00 – 15:30 Coffee Break
- 15:30 – 16:00 **Pedro Velarde** (Polytechnic University of Madrid)
A non-thermal, time-dependent atomic physics model with degeneration in X-ray interaction with matter: Model and results
- 16:00 – 16:30 **Laurent Mercadier** (European XFEL)
Transient absorption spectroscopy of XFEL-heated metals
- 16:30 – 17:00 Discussion
- 17:00 – 18:00 **Guided Tour through DESY**

Friday, 28 November 2025

CFEL Seminar rooms I-III, CFEL (Building 99), DESY, Hamburg

Session 5: *Extreme states of matter – From planetary science to inertial fusion energy research* (Chairs: Ulf Zastra and Beata Ziaja-Motyka)
(09:00 – 12:00)

- 09:00 – 09:30 **Tobias Dornheim** (Helmholtz-Zentrum Dresden-Rossendorf)
Towards model-free X-ray Thomson scattering diagnostics of extreme states of matter
- 09:30 – 10:00 **Ronald Redmer** (University of Rostock)
Collective XRTS for conditions inside red dwarf stars
- 10:00 – 10:30 Coffee Break
- 10:30 – 11:00 **Dirk Gericke** (University of Warwick)
Dense nonequilibrium systems probed by XFELs
- 11:00 – 11:30 **Dominik Kraus** (University of Rostock)
Experimental characterization of warm dense matter by X-ray scattering diagnostics at XFELs
- 11:30 – 11:50 Discussion
- 11:50 – 12:00 **Close-out**