Science@FELs 2024

17-21 June 2024 I Paris, France

Programme

Monday, June 17th, 2024 – SOLEIL Synchrotron

08:30 – 09:50	Registration, welcome coffee
09:50 – 10:00	WELCOME, ***Jean DAILLANT, SOLEIL General Director***
	Chair: ***Franck VIDAL***
10:00 – 10:50	**Plenary - *Steven Johnson*** *- ETH Zurich / Paul Scherrer Institute, Villigen, Swizerland* X-ray probes of coherence: Tools for understanding coupling and phase transitions in materials
10:50 – 11:10	*Coffee break*
11:10 – 11:30	**Contributed - *Masoud Lazemi*** *- Utrecht University, Netherlands* Real-time and element-specific observation of ultrafast carrier dynamics in $LaFeO_3$ epitaxial thin films by femtosecond X-ray absorption spectroscopy
11:30 – 12:00	**Invited - *Justine Schlappa*** *- European XFEL GmbH, Schenefeld, Germany* Relaxation dynamics in photodoped cuprates from time-resolved Resonant Inelastic X-ray Scattering at European XFEL
12:00 – 12:30	**Invited – *Jan-Christoph Deinert*** *- Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany* Probing complex material properties by THz harmonic generation
12:30 – 13:40	*Lunch at SOLEIL*
13:40 – 14:10	**Invited - *Simon Wall*** *- Department of Physics and Astronomy, Aarhus University, Denmark* Controlling phase transitions with correlated disorder
14:10 – 14:30	***Walking distance / Bus transfer for visits outside SOLEIL***
14:30 – 16:00	**Laboratory Visits** **Walking distance** – SOLEIL, ATTOLAB, APPOLON **Bus transfer** – CLIO
16:00 – 16:30	***Walking distance / Bus transfer to SOLEIL***
16:30 – 19:30	**Posters and appetizers**
19:30 - 20:30	***Optional bus transfer to Paris***

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Tuesday, June 18th, 2024 – Sorbonne Université

Chair: ***Debora SCUDERI***

09:00 – 09:50	**Plenary - *Jos Oomens* -** *Radboud University, Nijmegen, The Netherland* FEL-based infrared ion spectroscopy: Methods and applications
09:50 – 10:20	**Invited - *Cristian Svetina* -** *Instituto Madrileño de Estudios Avanzados en Nanociencia, Madrid, Spain* Advances of X-ray transient grating at European X-FEL
10:20 – 10:40	***Chair: Manfred HELM*** *FELs of Europe Award*
10:40 – 11:10	*Coffee break*

Chair: ***Jacques-Philippe COLLETIER***

11:10 – 11:40	**Invited - *Jean Yves Salpin* -** *Laboratoire Analyse, Modélisation, Matériaux pour la Biologie et l'Environnement - LAMBE, Université d'Evry Val d'Essonne, France* Gas-phase interactions of platinum drugs towards nucleic acid building blocks
11:40 – 12:00	**Contributed - *Laura Foglia*** *- Elettra Sincrotrone Trieste, Italy* Core-resonant self-diffraction of femtosecond extreme ultraviolet pulses
12:00 – 12:30	**Invited - *Valérie Panneels*** *- Paul Scherrer Institute, Villigen, Swizerland* Ultrafast dynamics of visual rhodopsin using an X-ray free-electron laser
12:30 – 13:40	*Lunch at Sorbonne Université*

Chair: ***Marc SIMON***

13:40 – 14:10	**Invited - *Fabiano Lever*** *- Deutsches Elektronen - Synchrotron DESY, Hamburg, Germany* Electronic molecular movies with FELs: The ultrafast dynamics of 2-thiouracil
14:10 – 14:30	**Contributed - *Christian Bressler*** *- European XFEL, Schenefeld, Germany* Femtosecond solvation dynamics around nascent aqueous halogen atoms Br^0 and I^0
14:30 – 14:50	**Contributed - *Timo Dededrichs*** *- Uppsala University, Sweden* Time-resolved XAS and RIXS of C-H bond activating transition metal complexes in solution
14:50 – 15:20	**Invited - *Michael Meyer*** *- European XFEL, Schenefeld, Germany* Recent results and new developments at the small quantum systems (SQS) instrument at European XFEL
15:20 – 15:40	**Contributed - *Rebecca Boll*** *- European XFEL, Schenefeld, Germany* Imaging a molecular elimination reaction with an X-ray free-electron laser

15:40 – 16:00 *Coffee break*

Chair: ***John BOZEK***

16:00 – 16:30
Invited - *Ulrike Frühling* - *Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany*
Ultrafast AMO experiments at FLASH

16:30 – 16:50
Contributed - *Saikat Nandi* *- CNRS, Institut Lumiere Matiere, France*
Seeded free-electron laser generates quantum entanglement between two massive particles

16:50 – 17:10
Contributed - *Abhishek Verma* *- Synchrotron SOLEIL, France*
Experimental study of post-collision interaction (PCI) in neon after double-core-ionization using the FEL radiation

17:10 – 17:40
Invited - *Ulrich Eichmann* *– Max Born Institute, Berlin, Germany*
Two-color stimulated Raman transitions in atomic systems from the XUV to the soft X-ray regime

17:40 – 18:00
Contributed – *Wieland Schöllkopf* *- Fritz-Haber-*Institut *der Max-Planck-Gesellschaft, Germany*
The 2-color infrared FEL at the Fritz Haber Institute in Berlin

18:00 – 18:20
Contributed - *Oliviero Cannelli* *- CFEL-ATTO, DESY, Switzerland*
On the element-selectivity of core-level transient grating spectroscopies

19:30 *Conference dinner in Paris at* ***La Coupole*** *- 102, boulevard de Montparnasse, 75014 PARIS*
For those who have registered for dinner.

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Wednesday, June 19th, 2024 – Sorbonne Université

Chair: ***Serguei MOLODTSOV***

09:00 – 09:50	**Plenary -** ***Jacques-Philippe Colletier*** *- Institut de Biologie Structurale, Grenoble, France* Iluminating protein structural dynamics by use of static and time-resolved crystallography at XFELs
09:50 – 10:20	**Invited -** ***Jasper van Thor*** *- Imperial College London, United Kingdom* Control and analysis of coherence in ultrafast X-ray crystallography
10:20 – 10:40	**Contributed -** ***Abhishek Mall*** *- Max Planck Institute for the Structure and Dynamics of Matter - Germany* High-throughput X-ray single particle imaging reveals structure variability and polymorphism in viral capsids
10:40 – 11:10	*Coffee break*

Chair: ***Laurent NAHON***

11:10 – 11:40	**Invited -** ***Minna Patanen*** *- University of Oulu, Finland* Coherent diffractive imaging of salt nanoparticles and sea spray aerosols
11:40 – 12:00	**Contributed –** ***Ltaief Ben Ltaief*** *- Department of Physics and Astronomy, Aarhus University, Denmark* Activation of nanoplasma in pure and doped He nanodroplets by XUV and soft X-ray light pulses
12:00 – 12:30	**Invited -** ***Thierry Ruchon*** **-** *LIDYL, CEA - Saclay, Gif-sur-Yvette, France* Dynamics of magnetic structures probed by magnetic helicoidal dichroism
12:30 – 13:40	*Lunch at Sorbonne Université*

Chair: ***Nicolas JAOUEN***

13:40 – 14:10	**Invited -** ***Emmanuelle Jal*** **-** *Laboratoire de Chimie Physique - Matière et Rayonnement, Paris, France* XFELs to unravel ultrafast magnetic dynamics
14:10 – 14:30	***Contributed - Elisa Collet*** *- IMDEA Nanoscience, Spain* Ultrafast X-ray and optical studies of charge carrier dynamics in colloidal quantum dots
14:30 – 15:00	**Invited -** ***Carl S. Davies*** **-** *HFML-FELIX, Radboud University, Nijmegen, The Netherlands* Ultrafast switching of magnetization at the frequency of optical phonons
15:00 – 15:20	***Contributed - Matthias Riepp*** *- Sorbonne Université, CNRS, Laboratoire de Chimie Physique – Matière et Rayonnement, LCPMR, France* THz-driven coherent magnetization dynamics in a labyrinth domain state

15:20 – 15:40 ***Contributed - Martin Mittendorff*** *- Universität Duisburg-Essen, Germany*
Strong magnetic fields from plasmonic ring currents in graphene disks

15:40 – 16:00 *Coffee break*

Chair: ***Minna PATANEN***

16:00 – 16:30 **Invited -** ***Dominik Kraus*** *- University of Rostock, Germany*
Light elements at Mbar to Gbar pressure

16:30 – 16:50 ***Contributed – Flavio Capotondi*** *- Elettra-Sincrotrone Trieste, Italy*
Time-domain EUV diffuse scattering phonon spectroscopy

16:50 – 17:10 ***Contributed - Vladimir Lipp*** *- Center for Free-Electron Science CFEL, DESY, Germany*
Modeling software SURFwiX to guide high-precision processing of materials of industrial relevance

17:10 – 17:40 **Invited -** ***June Wicks*** *- The Johns Hopkins University, Baltimore, USA*
X-ray illumination of phase transitions through shock compression and release

17:40 – 18:00 ***Contributed - Samuele Pelatti*** *- Università di Modena and Reggio Emilia, Italy*
XFEL-based pump-probe XAS and XES characterization of photoexcited states in CeO_2

18:00 – 18:20 ***Contributed - Zeinab Ebrahimpour*** *- Elettra-Sincrotrone Trieste S.C.p., Italy*
Pioneering plasma accelerators and novel sample delivery methods for future FEL experiments

18:20 End of conference

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SATELLITE WORKSHOP
Forum on Advanced FEL Techniques
Program

Thursday, June 20th, 2024 – Sorbonne Université

09:00 - 09:10 **Welcome and Introduction** - *Marie-Emmanuelle Couprie, John Bozek, Sverker Werin*

09:10 - 10:20 **Introduction and Overview of high repetition rate FELs -I**

Chair: ***Sverker Werin***

09:10 - 09:40 ***Marc Guetg*** - *DESY / EuXFEL*

Outlook on current high repetition rate FELs

09:40 - 10:00 ***Sandra Mous*** – *SLAC*

Science opportunities at LCLS-II and LCLS-II-HE

10:00 - 10:20 ***Ralf Röhlsberger*** – *EuXFEL*

Perspective for nuclear resonances at high repetition rate FELS

10:20 - 10:50 *Coffee Break*

10:50 - 12:15 **Overview of high repetition rate FELs -II**

Chair: ***Gianluca Geloni***

10:50 - 11:10 ***Immo Bahns*** – *EuXfel*

Status of the cavity based XFEL at European XFEL

11:10 - 11:30 ***David Dunning*** - *ASTEC/UKFEL project*

The UK XFEL Conceptual Design and Options Analysis

11:30 - 12:15 Discussion

Moderators : ***G. Geloni, S. Werin***

12:15 - 14:00 *Lunch at Sorbonne Université*

14:00 - 15:20 **Tailoring pulses I. (attosecond, polarization, seeding..)**

Chair: ***Luca Giannessi***

14:00 - 14:20 ***Carlo Spezzani*** – *FERMI*

Fast polarisation switching, multicolour operation and EEHG seeding at FERMI

14:20 - 14:40 ***Eugenio Ferrari*** – *FLASH*

First EEHG lasing at FLASH and future prospectives

14:40 - 15:00 ***Flavio Capotondi*** - *ELLETRA*

Seeded pulses at FERMI - User perspective

15:00 - 15:20	***Evgeniy Schneidmiller***– *DESY* Using reverse undulator taper for polarization control and short pulse generation in XFELs
15:20 - 15:50	*Coffee Break*
15:50 - 17:15	**Combining multi-colour pulses in FELs** Chair: ***John Bozek***
15:50 - 16:10	***Ziang Li*** – *PITZ* THz FEL at PITZ: Development on high-power accelerator based THz source for pump-probe experiments at the European XFEL
16:10 - 16:30	***Rebecca Boll*** – *EuXFEL* Two-color X-ray pump X-ray probe at FELs: opportunities and challenges
16:30 - 17:15	Discussion Moderators: ***John Bozek, Luca Giannessi***
19:00 - 22:00	*Workshop dinner in Paris at **Au Port Du Salut** - 163 Rue Saint-Jacques, 75005 Paris* *For those who have registered for dinner.*

Friday, June 21st, 2024 – Sorbonne Université

09:00 - 10:40	Chair: ***Marc Guetg*** Tailoring pulses II. Attoseconds and seeding
09:00 - 09:30	***Hugo Marroux*** – *CEA* HHG vs XFEL, strengths and weaknesses
09:30 - 09:50	***Svitozar Serkez*** – *EuXFEL* Towards attosecond pulses at the European XFEL
09:50 - 10:10	***Stephan Kuschel*** - *TU-Darmstadt/LCLS* First imaging experiments with hard and soft sub-fs FEL pulses at LCLS
10:10 - 10:40	Discussion Moderators: ***John Bozek, Marc Guetg***
10:40 - 11:10	*Coffee Break*
11:10 – 13:00	**Compact sources, and an outlook to the future** Chair: ***Marie-Emmanuelle Couprie***
11:10 - 11:40	***Bruce Dunham*** - *Xlight Inc.* Requirements for FEL in industrial applications in lithography

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11:40 - 12:00	***Marie Labat*** - *Synchrotron Soleil* First results and prospects on Free Laser Electrons driven by Laser Plasma Accelerators
12:00 - 12:20	***Enrica Chiadroni*** – *INFN* EuPRAXIA & SPARC-LAB, the path to FELs with plasma wakefield e-beam acceleration
12:20 - 12:50	Discussion - User perspective compact Moderators: ***Marie-Emmanuelle Couprie, Luca Giannessi***
12:50 - 13:00	***Marie-Emmanuelle Couprie, Sverker Werin*** Closeout summary
13:00	*End*