



UP 2024

XXIII INTERNATIONAL CONFERENCE ON ULTRAFAST PHENOMENA

Topical meeting and tabletop exhibit

www.up2024.org



CONFERENCE PROGRAMME

Venue: World Trade Center,
Barcelona, Spain

15 – 19 July 2024



Femtosecond Lasers for Industry & Science

Femtosecond Lasers

Wavelength-Tunable Sources

Microscopy Sources

Spectroscopy Systems

OPCPA Systems



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XXIII International Conference on Ultrafast Phenomena (UP)

15 - 19 July 2024,
World Trade Center, Barcelona, Spain

WELCOME to Barcelona and to the International Conference on Ultrafast Phenomena!

The Ultrafast Phenomena Conference series began in 1976 and is held every two years. It is widely recognized as the premier international forum for gathering the community of scientists and engineers working in research and technology related to ultrafast phenomena. It brings together atomic, molecular, and condensed matter physicists, physical chemists, biophysicists, and scientists developing new tools, methodologies and techniques, all working on the science of ultrafast phenomena.

This year's event - the XXIII biannual international conference - continues the tradition of bringing together a multidisciplinary group of researchers sharing a common interest in science and technology at the highest temporal resolution.

The conference will include 297 oral and poster contributions. We have scheduled 11 invited, 3 upgrade invited, 111 oral and 172 poster presentations from 26 countries for you to consider over what should be five very full days.

We hope that you will enjoy the unique beauty of Barcelona, the program, and the opportunity to spend time with colleagues from around the globe.

Sincerely,

Jens Biegert,

ICFO – The Institute of Photonic Sciences, Spain

Tobias Brixner,

University of Würzburg, Germany

Nirit Dudovich,

Weizmann Institute of Science, Israel

UP 2024 General Chairs

Akiyoshi Hishikawa,

Nagoya University, Japan

Amber Krummel,

Colorado State University, USA

UP 2024 Program Chairs

Conference Topics

Applications

Ultrafast technology for near-field and nonlinear microscopy, coherent Raman microscopy, real-time/real-space electron microscopy, medical applications, high speed communication, micromachining, 3D nanofabrication and more.

Biology

Photosynthesis, vision, heme proteins, photoactive proteins, photoisomerization in chromoproteins, wavepacket dynamics, femtobiology, structural dynamics with X-rays and electrons, medical applications.

Chemistry

Vibrational and conformational dynamics, energy transfer, femtochemistry, proton and electron transfer, solvation dynamics, wave packet dynamics and coherent control of reactions, ultrafast chiral phenomena, ultrafast imaging, structural dynamics with X-rays and electrons.

Materials science

Highly correlated systems, coherent phonons in solids, carrier dynamics in nanoparticles, carbon-based materials, two-dimensional materials, structural dynamics with X-rays and electrons.

Physics

Ultrafast nonlinear optical processes, kinetics of non-equilibrium processes, quantum confinement, coherent transients, nonlinear pulse propagation, ultrafast nano-optics, novel ultrafast spectroscopic techniques, high intensity physics, attosecond dynamics, plasmonics, terahertz radiation.

Sources and techniques

New sources, new wavelength regimes, frequency conversion techniques, amplifiers, attosecond pulse generation, free electron lasers, pulse shaping, pulse diagnostics, electro-optical sampling and detectors, measurement techniques and frequency combs.

Poster Sessions

172 posters will be presented during three sessions:

- ▶ Tuesday 16 July 2024 from 15:45 to 17:15
- ▶ Wednesday 17 July 2024 from 15:45 to 17:15
- ▶ Thursday 18 July 2024 from 15:45 to 17:15.

There will be no oral presentations during this time. Coffee breaks will be organised during the sessions. All poster sessions take place in Port Vell.

Instructions for Poster Presenters

Poster sessions are scheduled to provide an opportunity for selected papers to be presented in greater visual details and to facilitate discussions among attendees. To display his/her poster, each author is provided with a **156 cm high × 95 cm wide** poster board (inner size). Fixing material (tape) will be provided. The boards will be marked with the poster session code.

Authors are asked to put their posters in the morning of their assigned day. Poster presenters are absolutely asked to be present at their poster during their assigned poster session to allow informal discussions.

Speakers' Information

Durations of oral presentations are:

- ▶ 15 minutes (including 3 minutes for discussion) for contributed talks,
- ▶ 30 minutes (including 5 minutes for discussion) for invited talks.
- ▶ 22 minutes (panel discussion on strong coupling)

WARNING! Speakers are requested to upload their presentations in advance, check their presentations on the computers provided by the conference in the assigned lecture room during the coffee break preceding the talk or the afternoon of the day before for those scheduled early morning. This is mandatory as the schedule is tight and time has to be respected in order for listeners to move from one lecture hall to the other during parallel sessions. A student will be there to assist them.

Speakers are asked to check-in with the session chair in the conference room ten minutes before the session begins.

The lecture halls are equipped with microphones, projectors and computers. Oral sessions take place in the Auditorium or in the room A2+A3

Post-deadline contributions

As a tradition, the XXIII International Conference on Ultrafast Phenomena will showcase post-deadline presentations. The purpose of these contributions is to give

conference participants the opportunity to hear new and significant results in rapidly advancing areas. Only those papers judged to be truly excellent and compelling in their timeliness will be accepted for presentation as an oral contribution.

The post-deadline papers are scheduled for oral presentation on **Thursday 18 July 2024 between 17:15 - 19:00**.

Authors will be notified whether their papers have been accepted on Monday 15 July 2024 directly at the conference.

Conference Language

The official language of the conference is English.

Conference Digest

The registration fee includes an online digest including the two-page summaries.

Exhibition

A tabletop exhibit will be organised in Port Vell room. See list of exhibitors in the separate leaflet.

Exhibitors are asked to be present at their stand during the following time schedules:

Tuesday 16 July 2024,
10:15 - 10:45 *Exhibition and Coffee Break.*
15:45 - 17:15 *Exhibition, Coffee Break and Poster Session I.*

Wednesday 17 July 2024
10:15 - 10:45 *Exhibition and Coffee Break.*
15:45 - 17:15 *Exhibition, Coffee Break and Poster Session II*

Thursday 18 July 2024,
10:15 - 10:45 *Exhibition and Coffee Break.*
15:45 - 17:15 *Exhibition, Coffee Break and Poster Session III.*

The exhibition space is located next to the lecture halls and by the poster area, in order to allow easy and frequent contact with the attendees. Coffee breaks are arranged to give the participants the opportunity to visit the stands.

Exhibitors are requested to remove their material by Thursday 18 July 2024, after 17:15.

On-site Facilities / Rooms

The World Trade Center is equipped with WI-FI. In case of need, ask for your ticket (valid for one day) at the registration desk. Oral sessions take place in the Auditorium or Room A2+A3. **Eating or drinking in the lecture rooms is strictly forbidden.**

Poster sessions and the exhibition take place in Port Vell.

Lunches

Lunches are not included in the registration fees.

Four restaurants are directly located at the **World Trade Center BCN**. Other restaurants can easily be found at a walking distance from the venue.

Coffee Breaks

Coffee breaks are organized regularly throughout the week, between presentations in the Auditorium halls (Monday and Friday) or Port Vell room (from Tuesday to Thursday).

Social Programme

Tuesday 16 July 2024, from 20:00 to 23:00

- ➔ **From 20:00 to 22:00: Private visit of the maritime museum.**
- ➔ **From 20:30 to 23:00: Conference banquet, Sala Gran, at the Museu Maritim de Barcelona. Address: Av. de les Drassanes, s/n, 08001 Barcelona, Tel. 933 429930, www.mmb.cat**

To attend, participants are requested to wear their badges.

The dinner is included in the registration fee. Additional guest tickets for the dinner can be obtained at a special unit cost of 80€. No shuttle will be organised.



We thank **Coherent Inc.** who contributed to sponsor this event.

How to go there?

From WTC:

4 min (900 m) via Moll 18 C Barcelona et Av. del Paral·lel.

4 min (850 m) via Moll 18 C Barcelona.

By bus:

Drassanes stop, on Passeig Josep Carner: D20, H14

Portal de la Pau stop: V13, D20, H14, 59, 120

La Rambla stop – Plaça del Teatre: V13, 59

La Rambla stop – Santa Mònica: V13, 59

Paral·lel stop – Shipyards: 21, D20, V11, H14

By metro:

L3 – Drassanes Station

(exit through Portal de Santa Madrona)



L2, L3- Paral·lel Station

(exit at Avinguda Paral·lel)

Registration Information

The registration fees for the meeting include:

- ✓ **Admission to the technical sessions** of the conference (oral and poster sessions).
- ✓ **Online digest including the two-page summaries.**
- ✓ **Exhibition** running from Tuesday to Thursday.
- ✓ **Conference banquet and visit of the maritime museum** on Tuesday evening.
- ✓ **Coffee breaks** (Monday morning through Friday morning) as mentioned in the programme at a glance.

Lunches are not included. Transportation tickets are not included.

Conference Registration Hours:

Monday 15 July 2024

➔ **08:00 - 12:00 and 13:45 - 17:00**

Tuesday 16 July 2024

➔ **08:00 - 12:00 and 13:45 - 17:00**

Wednesday 17 July 2024

➔ **08:00 - 11:45 and 13:45 - 16:00**

Thursday 18 July 2024

➔ **08:00 - 11:45 and 13:45 - 16:00**

Friday 19 July 2024

➔ **closed**

Conference Hours:

Monday 15 July 2024

➔ **08:30 - 12:30 and 14:00 - 18:15**

Tuesday 16 July 2024

➔ **08:30 - 12:30 and 14:00 - 19:00**

Wednesday 17 July 2024

➔ **08:30 - 12:30 and 14:00 - 17:15**

Thursday 18 July 2024

➔ **08:30 - 12:30 and 14:00 - 19:00**

Friday 19 July 2024

➔ **08:30 - 12:30**

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Conference Venue

The UP2024 conference will take place at the World Trade Center Barcelona.

Coordinates:

1^a planta Edif. Este, Moll de Barcelona, s/n, 08039 Barcelona, Spain
Phone: +34 935 08 88 88
<https://www.wtcbarcelona.com/>

Transportation

Arriving by train:

The closest train station to WTCB is the Rodalies station in Plaça Catalunya. To get there, take line R1, R3, R4 or the regional R12

Arriving by plane:

From El Prat Airport, you can get to WTCB by taxi or private vehicle by taking the B-10 towards Ronda Litoral until you reach Moll de la Fusta. By bus, take the T1 and the D20.

Arriving by bus:

If you're travelling to WTCB by bus, take lines

V11, 91, D20, H14, V13, N0 or N6 (at night). On the metro, get off at Drassanes (L3) or Parallel (L3 and L2).

Conference Committees

General Chairs

- **Jens Biegert**,
ICFO – The Institute of Photonic Sciences, Spain
- **Tobias Brixner**,
University of Würzburg, Germany
- **Nirit Dudovich**,
Weizmann Institute of Science, Israel

Program Chairs

- **Akiyoshi Hishikawa**,
Nagoya University, Japan
- **Amber Krummel**,
Colorado State University, USA

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- **Junko Yano**,
LBNL, USA

See online programme:

<https://virtual.oxfordabstracts.com/#/e/up2024/program>



MONDAY 15 JULY 2024

CONTRIBUTIONS	SESSION	SESSION TITLE OR EVENT	LOCATION	TIME
		Opening Remarks	Auditorium	08:30 - 08:45
Oral	Mo-1A	Structural Changes	Auditorium	08:45 - 10:15
		COFFEE BREAK	Auditorium halls	10:15 - 10:45
Oral	Mo-2A	Chirality	Auditorium	10:45 - 12:30
Oral	Mo-2B	Low-Dimensional Materials	Room A2+A3	10:45 - 12:30
Oral	Mo-3A	Attosecond Science	Auditorium	14:00 - 15:45
		COFFEE BREAK	Auditorium halls	15:45 - 16:15
Oral	Mo-4A	Panel Discussion on Strong Coupling	Auditorium	16:15 - 18:15

TUESDAY 16 JULY 2024

CONTRIBUTIONS	SESSION	SESSION TITLE OR EVENT	LOCATION	TIME
Oral	Tu-1A	Advanced Light Source Technologies	Auditorium	08:30 - 10:15
		EXHIBITION AND COFFEE BREAK	Port Vell	10:15 - 10:45
Oral	Tu-2A	Topology and 2D Materials	Auditorium	10:45 - 12:30
Oral	Tu-2B	Charge Transfer	Room A2+A3	10:45 - 12:30
Oral	Tu-3A	Visible Spectroscopy and New Methods	Auditorium	14:00 - 15:45
Poster	Tu-PO	EXHIBITION, COFFEE BREAK & POSTER SESSION I	Port Vell	15:45 - 17:15
Oral	Tu-4A	Nonlinear Phenomena in Solids	Auditorium	17:15 - 19:00
		Museum visit	Maritime museum	20:00 - 22:00
		Conference banquet	Maritime museum	20:30 - 23:00

WEDNESDAY 17 JULY 2024

CONTRIBUTIONS	SESSION	SESSION TITLE OR EVENT	LOCATION	TIME
Oral	We-1A	Excitons	Auditorium	08:30 - 10:15
		EXHIBITION AND COFFEE BREAK	Port Vell	10:15 - 10:45
Oral	We-2A	Dynamics in Solids	Auditorium	10:45 - 12:30
Oral	We-2B	Novel Schemes for Ultrashort Pulses	Room A2+A3	10:45 - 12:30
Oral	We-3A	Photoelectron Spectroscopy and Coulomb Explosion	Auditorium	14:00 - 15:30
Poster	We-PO	EXHIBITION, COFFEE BREAK & POSTER SESSION II	Port Vell	15:45 - 17:15

THURSDAY 18 JULY 2024

CONTRIBUTIONS	SESSION	SESSION TITLE OR EVENT	LOCATION	TIME
Oral	Th-1A	Light Harvesting and Energy Transfer	Auditorium	08:30 - 10:15
		EXHIBITION AND COFFEE BREAK	Port Vell	10:15 - 10:45
Oral	Th-2A	Coupling to Environment and Vibrations	Auditorium	10:45 - 12:30
Oral	Th-2B	Ultrafast Technologies and Applications	Room A2+A3	10:45 - 12:30
Oral	Th-3A	Electronic Structure of Materials	Auditorium	14:00 - 15:45
Poster	Th-PO	EXHIBITION, COFFEE BREAK & POSTER SESSION III	Port Vell	15:45 - 17:15
Oral	Th-4A	Postdeadline Paper Session	Auditorium	17:15 - 19:00

FRIDAY 19 JULY 2024

CONTRIBUTIONS	SESSION	SESSION TITLE OR EVENT	LOCATION	TIME
Oral	Fr-1A	Applications	Auditorium	08:30 - 10:15
		COFFEE BREAK	Auditorium halls	10:15 - 10:45
Oral	Fr-2A	Microscopy	Auditorium	10:45 - 12:45

Invited Talks at a Glance

Monday 15 July 2024, Auditorium

08:45 - 09:15 Mo-1A.1

Two-Dimensional Electronic Spectroscopy of TransientsTahei Tahara,
RIKEN, Wako, Japan

14:00 - 14:30 Mo-3A.1

Attosecond ionization dynamics of 2D moleculesVincent Loriot¹, Alexie Boyer¹,
Saikat Nandi¹, Celso Gonzalez-Collado²,
Etienne Plésiat³, Alexandre Marciniak⁴,
Clara L. Garcia¹, Yaowei Hu¹,
Manuel Lara-Astiaso², Alicia Palacios^{2,5,6},
Piero Decleva⁷, Fernando Martín^{2,3,6},
Franck Lépine¹¹ Institut Lumière Matière, Villeurbanne, France² Universidad Autónoma, Madrid, Spain³ IMDEA-Nanociencia, Madrid, Spain⁴ LCAR, Toulouse, France⁵ IAdChem, Madrid, Spain⁶ IFIMAC, Madrid, Spain⁷ Dipartimento di Scienze Chimiche
e Farmaceutiche, Trieste, Italy

16:15 - 16:37 Mo-4A.1

Impulsive and Adiabatic Ultrafast Electronic Control Schemes in MoleculesHendrike Braun¹, Arne Senftleben¹,
Tim Bayer², Matthias Wollenhaupt²,
Thomas Baumert¹¹ Universität Kassel, Kassel, Germany.² Carl von Ossietzky Universität Oldenburg,
Oldenburg, Germany of Technology,
Cambridge, MA, USA

16:37 - 16:59 Mo-4A.2

Ultrafast molecular chirality: a topological connectionOlga Smirnova,
MBI, Berlin, Germany

16:59 - 17:21 Mo-4A.3

Ultrafast Dynamics of Molecular Vibrational PolaritonsWei Xiong,
University of California, San Diego,
La Jolla, USA

17:21 - 17:43

Mo-4A.4

Light-matter interactions in photonic time-crystalsWei Xiong,
Mordechai Segev¹, Ohad Segal¹,
Noa Konforty¹, Mark Lyubarov²,
Yonatan Plotnik¹, Eran Lustig³,
Alexander Dikopoltsev⁴
¹ Technion, Haifa, Israel
² Technion, Haifa, Yemen
³ Stanford, Palo Alto, USA
⁴ ETH, Zurich, Switzerland

Tuesday 16 July 2024, Auditorium

08:30 - 09:00 Tu-1A.1

Generation of intense optical Schrödinger "cat" states and applications in non-linear opticsParaskevas Tzallas
FORTH-IESL, Heraklion (Crete), Greece.
ELI-ALPS, Szeged, Hungary

17:15 - 17:45 Tu-4A.1

High-Order Harmonic Generation in Confined SystemsMartin Thümmel, Alexander Croy,
Daniil Kartashov, Ulf Peschel,
Stefanie Gräfe
Friedrich Schiller University Jena,
Jena, Germany

Wednesday 17 July 2024, Auditorium

08:30 - 09:00 We-1A.1

Quantum Engineering of Exciton Transport and AnnihilationLibai Huang, Purdue University,
West Lafayette, USA

14:00 - 14:30 We-3A.1

Non-Adiabatic Dynamics of Gaseous and Aqueous Molecules Studied using Extreme Ultraviolet Time-Resolved Photoemission SpectroscopyToshinori Suzuki
Kyoto University, Kyoto, Japan

Thursday 18 July 2024, Auditorium

08:30 - 09:00 Th-1A.1

Ultrafast 2D Spectroscopy Unveils Self-Assembly Pathways of an Artificial Light-Harvesting ComplexMaxim S. Pshenichnikov¹,
Marick Manrho¹, Sundar Raj
Krishnaswamy¹, Björn Kriete¹,
Ilias Patmanidis^{2,3}, Alex H. de Vries²,
Siewert J. Marrink², Thomas L. C. Jansen¹,
Jasper Knoester^{1,4}¹ University of Groningen, Zernike
Institute for Advanced Materials,
Groningen, Netherlands.² University of Groningen, Groningen
Biomolecular Sciences and Biothechnology
Institute, Groningen, Netherlands.³ Aarhus University, Department
of Chemistry, Aarhus, Denmark.⁴ Leiden University, Faculty of Science,
leiden, Netherlands

14:00 - 14:30 Th-3A.1

High-Harmonic Microscopy Reveals Ultrafast Spin Dynamics at Magnetic Domain BoundariesSergey Zayko¹, Hung-Tzu Chang¹,
Ofer Kfir², Timo Schmidt³, Murat Sivis¹,
Manfred Albrecht³, Claus Ropers¹¹ Max Planck Institute for Multidisciplinary
Sciences, Göttingen, Germany.² School of Electrical Engineering,
Faculty of Engineering, Tel Aviv University,
Tel Aviv, Israel.³ Experimental Physics IV, Institute
for Physics, University of Augsburg,
Augsburg, Germany

Friday 19 July 2024, Auditorium

08:30 - 09:00 Fr-1A.1

Attosecond Electron MicroscopyPeter Baum
Universität Konstanz, Konstanz, Germany

10:45 - 11:15 Fr-.2A1

Few-electron correlations and number statistics of free electron pulses in ultrafast photoemission from metal needle tipsJonas Heimerl¹, Stefan
Meier¹, Alexander Mikhaylov²,
Maria Chekhova^{1,2}, Peter Hommelhoff¹¹ Friedrich-Alexander Universität
Erlangen-Nürnberg, Erlangen, Germany.² Max Planck Institute for the Science
of Light, Erlangen, Germany

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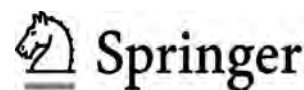
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Thanks to the Programme Committee!

We would like to address our sincere thanks to the committee members who built this programme and generously collaborated to make UP-2024 successful.

Thanks to the Contributors and Participants!

The Programme Committee together with the conference management address their sincere thanks to the UP-2024 contributors and participants, thus contributing in a successful event.

Conference Management

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www.eps.org

40
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online programme

