

## Prof. Dr. Hans Jakob Wörner

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CONTACT INFORMATION	Prof. Dr. Hans Jakob Wörner ETH Zürich Laboratorium für Physikalische Chemie HCI E 237 Vladimir-Prelog-Weg 2 8093 Zürich Switzerland	<i>Tel.:</i> +41 44 6334412 <i>Fax:</i> +41 44 6321021 <i>E-mail:</i> woerner@phys.chem.ethz.ch <i>Website:</i> <a href="http://www.atto.ethz.ch">http://www.atto.ethz.ch</a>
NATIONALITIES	Swiss and German	
DATE OF BIRTH	March 13 <sup>th</sup> , 1981	
PLACE OF BIRTH	Freiburg im Breisgau, Germany	
MARITAL STATUS	Married, three children (born 2012, 2014 and 2017)	
APPOINTMENTS	<b>Laboratory of Physical Chemistry, ETH Zürich, Switzerland</b>	<b>09/2010 - present</b>
	Full Professor	03/2023 - present
	Associate Professor	10/2013 - 03/2023
	Assistant Professor	09/2010 - 09/2013
	<b>Joint Laboratory for Attosecond Science, National Research Council of Canada, Ottawa, Canada</b>	<b>08/2007 - 07/2010</b>
	Research Associate in the group of Prof. P. B. Corkum	
	<b>Laboratoire Aimé-Cotton du CNRS, Orsay, France</b>	<b>04/2007 - 06/2007</b>
	Postdoctoral Fellow with Prof. Ch. Jung	
EDUCATION	<b>ETH Zürich, Switzerland</b>	
	PhD in Physical Chemistry 2007	<b>01/2004 - 02/2007</b>
	• Dissertation Topic: “High-resolution spectroscopic studies of non-Born-Oppenheimer effects”	
	• Advisor: Prof. Frédéric Merkt	
	Diploma in Chemistry	<b>2003</b>
	Studies of Chemistry (2 <sup>nd</sup> preliminary diploma and diploma)	<b>2000 - 2003</b>
	<b>EPFL, Lausanne, Switzerland</b>	<b>1999 - 2000</b>
	Studies of Chemistry (1 <sup>st</sup> preliminary diploma)	
HONORS AND AWARDS	<b>International Solvay Institutes</b>	<b>2020</b>
	New Horizon Lectureship	
	<b>The Coblenz Society, USA</b>	<b>2018</b>
	Coblenz Award	
	<b>European Research Council</b>	<b>2017</b>
	ERC Consolidator Grant	
	<b>Leopoldina, German National Academy of Sciences Halle (Saale), Germany</b>	<b>2015</b>
	Carus Medal	

<b>Otto Klung Foundation at the Free University of Berlin and Dr. Wilhelmy Foundation, Germany</b>	<b>2014</b>
Klung Wilhelmy Science Award	
<b>32<sup>nd</sup> International Symposium on Free Radicals, Potsdam, Germany</b>	<b>2013</b>
Broida Prize	
<b>German Bunsen Society for Physical Chemistry, Frankfurt, Germany</b>	<b>2013</b>
Nernst-Haber-Bodenstein Prize	
<b>ETH Zürich, Switzerland</b>	<b>2012</b>
Ruzicka Prize	
<b>Göttingen Academy of Sciences and Humanities, Germany</b>	<b>2012</b>
Academy Prize for Chemistry	
<b>European Research Council</b>	<b>2012</b>
ERC Starting Grant	
<b>Swiss Chemical Society, Berne, Switzerland</b>	<b>2012</b>
Grammaticakis-Neumann International Prize in Photochemistry	
<b>Swiss National Science Foundation, Berne, Switzerland</b>	
SNSF Professorship	<b>2010</b>
Postdoctoral Fellowship	<b>2007</b>
<b>ETH Zürich, Switzerland</b>	
ETH Medal for outstanding PhD thesis	<b>2007</b>
Willi-Studer Prize for the best degree in Chemistry	<b>2003</b>
Oscar-Jeger Fellowship	<b>2002</b>
<b>German National Academic Foundation, Bonn, Germany</b>	<b>1999 - 2003</b>
Scholarship	
<b>Ministère de l'éducation nationale, Paris, France</b>	<b>1999</b>
First prize in the "Concours général des Lycées" in Chemistry and Physics	
<b>31<sup>st</sup> International Chemistry Olympiad, Bangkok, Thailand</b>	<b>1999</b>
Gold medal	
<b>30<sup>th</sup> International Chemistry Olympiad, Melbourne, Australia</b>	<b>1998</b>
Bronze medal	

#### GRANTS

- Attosecond chemistry in the gas and liquid phases, Swiss National Science Foundation (SNSF), duration 01/10/2021 - 30/09/2025.
- Time-resolved measurements of intermolecular Coulombic decay, ETH Zurich Research Grant, 02/21 - 02/24.
- High-repetition-rate laser source for attosecond time-resolved measurements in molecules and liquids, SNSF/ETH Zurich Scient. Equip. Program, 01/21 - 12/21.
- Attosecond high-harmonic spectroscopy of liquids, ETH Zurich Research Grant, 02/20 - 01/23.
- Attosecond soft-X-ray spectroscopy, National Competence Center in Research (NCCR): Molecular Ultrafast Science and Technology, 07/18-06/22.
- Attosecond X-ray spectroscopy of liquids, European Research Council, ERC Consolidator Grant, 01/04/18-31/03/23.
- Soft-X-ray spectroscopy on the attosecond time scale, Swiss National Science Foundation (SNSF), duration 01/04/2017 - 31/03/2021.
- Attosecond time-resolved soft-X-ray absorption spectroscopy, ETH Zurich Research Grant, duration 01/02/2017 - 31/01/2020.
- Attosecond coincidence spectroscopy of liquids and gases, Swiss National Science

Foundation (SNSF)/ ETH Zurich Scientific Equipment Program, duration 01/01/2017-31/12/2017.

- Attosecond spectroscopy in the liquid phase, Swiss National Science Foundation (SNSF), duration 01/09/2015 - 31/08/2018.
- Attosecond transient-absorption spectroscopy of electronic dynamics in molecules, Swiss National Science Foundation (SNSF), duration 01/04/2015 - 31/03/2017.
- Fourier-plane parametric amplifier for attosecond science in the water window, Swiss National Science Foundation (SNSF), duration 01/12/2014 - 30/11/2015.
- Attosecond and femtosecond XUV photoelectron spectroscopy, National Competence Center in Research (NCCR): Molecular Ultrafast Science and Technology (MUST), duration 01/07/2014 - 30/06/2018.
- Measuring attosecond electron dynamics in molecules, European Research Council, ERC Starting Grant, duration 01/09/2012 - 31/08/2017.
- Attosecond imaging of chemical dynamics, Swiss National Science Foundation (SNSF), duration 09/2010 - 08/2014.
- Ultrafast time-resolved photoelectron spectroscopy of solvated metal oxide nanoparticles, ETH FAST initiative, part of National Competence Center in Research (NCCR): Molecular Ultrafast Science and Technology (MUST), duration 01/12/2011 - 30/11/2014.
- Probing attosecond time-scale molecular dynamics, ETH Zürich, duration 01/2012 - 12/2014.
- Time-resolved high-harmonic spectroscopy of chemical reactions, ETH Zürich, duration 01/2011 - 12/2013.
- Attosecond time-resolved photoionization and diffraction, Swiss National Science Foundation (SNSF), duration 11/2011 - 10/2013.

## TEACHING

### Lecturer

**2010 - present**

ETH Zürich, Switzerland

- General Chemistry I, autumn semester 2017 - 2023: Bachelor-level course, 200 students, 4 hours weekly, including exercises
- Advanced Kinetics, spring semesters 2014 - 2019: Master-level course, 30 students, 3 hours weekly, including exercises
- Physical Chemistry II: Chemical Reaction Kinetics, autumn semesters 2013 - 2016: Bachelor-level course, 150 students, 4 hours weekly, including exercises
- Physical Chemistry V: Spectroscopy, spring semesters 2011 - 2013 and 2020 - 2023: Bachelor-level course, 50-60 students, 3 hours weekly, including exercises

### Co-organizer

**2010 - present**

ETH Zürich, Switzerland

- Physical Chemistry Colloquium
- Seminar on Theoretical Chemistry, Molecular Spectroscopy and Dynamics
- Laser Seminar

### Teaching Assistant

**2004 - 2007**

ETH Zürich, Switzerland

- Molecular Spectroscopy
- Chemical Kinetics
- Molecular Quantum Mechanics
- Thermodynamics

## ACADEMIC ACTIVITIES

Member of Advisory Boards:

- Member of the Editorial Advisory Board of *Structural Dynamics* (AIP)
- Member of the International Committee of the conference series on Attosecond Science and Technology

Member of Review Panels:

- Member of the Proposal Review Panel of the Swiss Free-Electron Laser (SwissFEL), 2018-present
- Member of the Review Panel of the FLASH FL26/REMI beamline at DESY, Hamburg, Oct. 2022
- Member of the Review Panel of the DFG Review Panel on SFB 1242/2 in Duisburg/Essen, Feb. 2020
- Member of the Proposal Review Panel of the Swiss Light Source (SLS), 2012-2018

Organization of conferences and conference sessions:

- “Ultrafast Optical Technologies” Chair of Sub-Committee for the Conference on Lasers and Electro-Optics (CLEO) / and European Quantum Electronics Conference (EQEC), Munich, Germany, June 23-27, 2019
- “Organization of the scientific programme of the NCCR-MUST annual meeting, Grindelwald, Switzerland, January 22-24, 2018
- Member of the International Steering Committee for the International Conference on Extreme Light (ICEL) 2017, Szeged, Hungary, November 6-9, 2017
- “Ultrafast Optical Technologies” Chair of Sub-Committee for the Conference on Lasers and Electro-Optics (CLEO) / Europe 2017, Munich, Germany, June 25-29, 2017
- Session Chair at Faraday Discussion, “Ultrafast Imaging of Photochemical Dynamics”, Edinburgh, UK, August 31 - September 2, 2016
- “Ultrafast Optics and Applications” Sub-Committee for the Conference on Lasers and Electro-Optics (CLEO) / Europe - the European Quantum Electronics Conference (EQEC) 2015, Munich, Germany, June 21-25, 2015
- “Ultrafast Dynamic Imaging of Matter”, Grindelwald, Switzerland, March 8-12, 2015
- “Physical Chemistry” at the Fall Meeting of the Swiss Chemical Society, Zurich, Switzerland, September 11, 2014
- “Chemical Dynamics”, 113<sup>th</sup> Bunsentagung (Annual German Conference on Physical Chemistry), Hamburg, May 29-31, 2014
- “Ultrafast Chemical Dynamics” at the Frontiers in Optics / Laser Science Conference of the Optical Society of America, Orlando (Florida), USA, October 6-10, 2013
- “High-Harmonic Spectroscopy”, Wilhelm and Else Heraeus-Seminar, Bad Honnef, Germany, January 28 - February 1, 2013
- “Ultrafast Chemical Dynamics” at the Frontiers in Optics / Laser Science Conference of the Optical Society of America, Rochester (New York), USA, October 14-18, 2012
- Physical Chemistry at the Fall Meeting of the Swiss Chemical Society, September 13, 2012

Reviewer for the following funding agencies:

- Swiss National Science Foundation (SNSF)
- European Research Council (ERC)
- US Department of Energy (DOE)
- Austrian Science Foundation (FWF)
- Japan Society for the Promotion of Science (JSPS)
- Deutsche Forschungsgemeinschaft (DFG)
- Agence Nationale de la Recherche (ANR)

Reviewer for the following journals ( $\sim 25$  articles / year):

- Nature, Science, Nature Physics, Nature Chemistry, Nature Communications, Physical Review Letters, Physical Review A, Journal of Chemical Physics, Molecular Physics, Chemical Physics, Physical Chemistry Chemical Physics, Journal of Computational and Theoretical Chemistry, Optics Express, Applied Sciences, etc.

145. Attosecond circular-dichroism chronoscopy of electron vortices  
M. Han, J.-B. Ji, T. Balčiūnas, K. Ueda, **H. J. Wörner**  
*Nat. Phys.* **19**, 230 (2023)
144. Apparatus for attosecond transient-absorption spectroscopy in the water-window soft-X-ray region  
K. S. Zinchenko, F. Ardana-Lamas, V. Utrio Lanfaloni, T. T. Luu, Y. Pertot, M. Huppert, **H. J. Wörner**  
*Sci. Rep.* **13**, 3059 (2023)
143. Ultrafast dissociation of nitromethane from the 3p Rydberg state  
M. D. J. Waters, J. T. Casanova, **H. J. Wörner**  
*Mol. Phys.* e2164749 (2023)
142. Two-Center Interference in the Photoionization Delays of Kr<sub>2</sub>  
S. Heck, M. Han, D. Jelovina, J.-B. Ji, C. Perry, X. Gong, R. Lucchese, K. Ueda, **H. J. Wörner**  
*Phys. Rev. Lett.* **129**, 133002 (2022)
141. Ground-state Photoelectron Circular Dichroism of Methyl p-Tolyl Sulfoxide by Single-photon Ionisation from a Table-top Source  
M. D. J. Waters, N. Ladda, A. Senftleben, V. Svoboda, M. Belozertsev, T. Baumert, **H. J. Wörner**  
*Chem. Phys. Chem.* e202200575 (2022)
140. The ultrafast vibronic dynamics of ammonia's  $\tilde{D}$  state  
M. D. J. Waters, **H. J. Wörner**  
*Phys. Chem. Chem. Phys.* **24**, 23340 (2022)
139. Attosecond Spectroscopy of Size-Resolved Water Clusters  
X. Gong, S. Heck, D. Jelovina, C. Perry, K. Zinchenko, R. Lucchese, **H. J. Wörner**  
*Nature* **609**, 507 (2022)
138. Decoherence and Revival of Attosecond Charge Migration Driven by Non-adiabatic Dynamics  
D. Matselyukh, V. Despré, N. Golubev, A. Kuleff, **H. J. Wörner**  
*Nat. Phys.* **18**, 1206 (2022)
137. Different Time Scales during Ultrafast Stilbene Isomerization in the Gas and Liquid Phases revealed using Time-Resolved Photoelectron Spectroscopy  
C. Wang, M. D. J. Waters, P. Zhang, J. Suchan, V. Svoboda, T. T. Luss, C. Perry, Z. Yin, P. Slavíček, **H. J. Wörner**  
*Nat. Chem.* **14**, 1126 (2022)
136. Attosecond Photoionization Dynamics: From Molecules over Clusters to the Liquid Phase  
X. Gong, I. Jordan, M. Huppert, S. Heck, D. Baykusheva, D. Jelovina, A. Schild, **H. J. Wörner**  
*Chimia* **76**, 520 (2022)
135. Energy scaling of carrier-envelope-phase-stable sub-two-cycle pulses at 1.76  $\mu\text{m}$  from hollow-core-fiber compression to 1.9 mJ  
K. S. Zinchenko, F. Ardana-Lamas, V. Utrio Lanfaloni, Y. Pertot, T. T. Luu, **H. J. Wörner**  
*Opt. Exp.* **30**, 22376 (2022)
134. Femtosecond photoelectron circular dichroism of chemical reactions  
V. Svoboda, N. Bhargava Ram, D. Baykusheva, D. Zindel, M. D. J. Waters, B. Spenger, M. Ochsner, H. Herburger, J. Stohner, **H. J. Wörner**  
*Sci. Adv.* **8**, 1 (2022)

133. Generation and complete polarimetry of ultrashort circularly polarized extreme-ultraviolet pulses  
V. Svoboda, M. D. J. Waters, D. Zindel **H. J. Wörner**  
*Opt. Exp.* **30**, 14358 (2022)
132. Intermolecular Coulombic decay in liquid water  
P. Zhang, C. Perry, T. T. Luu, D. Matselyukh, **H. J. Wörner**  
*Phys. Rev. Lett.* **128**, 133001 (2022)
131. Temperature Measurements of Liquid Flat Jets in Vacuum  
Y.-P. Chang, Z. Yin, T. Balčiūnas, **H. J. Wörner**  
*Struct. Dyn.* **9**, 014901 (2022)
130. Low-energy electron distributions from the photoionization of liquid water: a sensitive test of electron mean-free paths  
T. Gadeyne, P. Zhang, A. Schild, **H. J. Wörner**  
*Chem Sci.* **13**, 1675 (2022)
129. Attosecond interferometry of shape resonances in the recoil frame of CF<sub>4</sub>  
S. Heck, D. Baykusheva, M. Han, J.-B. Ji, C. Perry, X. Gong, **H. J. Wörner**  
*Sci. Adv.* **7**, eabj8121 (2021)
128. Generation of circularly polarized extreme-ultraviolet harmonics from solids  
T. T. Luu, **H. J. Wörner**  
*Eur. Phys. J. Spect. Top.* **230**, 4057 (2021)
127. Polarization measurements of deep- to extreme-ultraviolet high harmonics generated in liquid flat sheets  
V. Svoboda, Z. Yin, T. T. Luu, **H. J. Wörner**  
*Opt. Exp.* **29**, 30799 (2021)
126. Quantitative uncertainty determination of phase retrieval in RABBITT  
J.-B. Ji, S. Heck, M. Han, **H. J. Wörner**  
*Opt. Exp.* **29**, 27732 (2021)
125. Complete characterization of sub-Coulomb-barrier tunneling with phase-of-phase attoclock  
M. Han, P. Ge, J. Wang, Z. Guo, Y. Fang, X. Ma, X. Yu, Y. Deng, **H. J. Wörner**, Q. Gong, Y. Liu  
*Nat. Photonics* **15**, 765 (2021)
124. All-XUV pump-probe transient absorption spectroscopy of the structural molecular dynamics of di-iodomethane  
M. Rebholz, T. Ding, V. Despré, L. Aufleger, M. Hartmann, K. Meyer, V. Stooss, A. Magunia, D. Wachs, P. Birk, Y. Mi, G. Dimitrova Borisova, C. da Costa Castanheira, P. Rupprecht, G. Schmid, K. Schnorr, C. D. Schröter, R. Moshhammer, Z.-H. Loh, A. R. Attar, S. R. Leone, T. Gaumnitz, **H. J. Wörner**, S. Roling, M. Butz, H. Zacharias, S. Düsterer, R. Treusch, G. Brenner, J. Vester, A. I. Kuleff, Ch. Ott, T. Pfeifer  
*Phys. Rev. X* **11**, 031001 (2021)
123. Photoelectron spectroscopy of liquid water with tunable extreme-ultraviolet radiation: effects of electron scattering  
C. F. Perry, I. Jordan, P. Zhang, A. von Conta, F. B. Nunes, **H. J. Wörner**  
*J. Phys. Chem. Lett.* **12**, 2990 (2021)
122. Sub-7-femtosecond conical-intersection dynamics probed at the carbon K-edge  
K. S. Zinchenko, F. Ardana Lamas, I. Seidu, S. P. Neville, J. van der Veen, V. Utrio Lanfaloni, **H. J. Wörner**  
*Science* **371**, 489 (2021)
121. Evolution and ion kinetics of a XUV-induced nanoplasma in ammonia clusters  
R. Michiels, A. C. LaForge, M. Bohlen, C. Callegari, A. Clark, A. von Conta, M. Coreno, M. Di Fraia, M. Drabbels, P. Finetti, M. Huppert, V. Oliver, O. Plekan, K. C. Prince, S. Stranges, **H. J. Wörner**, F. Stienkemeier  
*J. Phys. B: At. Mol. Opt. Phys* **54**, 024002 (2021)

120. Nonlocal mechanisms of attosecond interferometry in three-dimensional systems  
D. Jelovina, A. Scrinzi, **H. J. Wörner**, A. Schild  
*J. Phys. Photonics* **3**, 014005 (2021)
119. Few-cycle high-harmonic generation in liquids: in-operando thickness measurement of flat microjets  
Z. Yin, T. T. Luu, **H. J. Wörner**  
*J. Phys. Photonics* **2**, 044007 (2020)
118. Attosecond spectroscopy of liquid water  
I. Jordan, M. Huppert, D. Rattenbacher, M. Peper, D. Jelovina, C. Perry, A. von Conta, A. Schild, **H. J. Wörner**  
*Science* **369**, 974 (2020)
117. Probing molecular environment through photoemission delays  
S. Biswas, B. Förg, L. Ortman, J. Schötz, W. Schweinberger, T. Zimmermann, L. Pi, D. Baykusheva, H. A. Masood, I. Lontos, A. M. Kamal, N. G. Kling, A. F. Alharbi, M. Alharbi, A. M. Azzeer, G. Hartmann, **H. J. Wörner**, A. S. Landsman and M. F. Kling  
*Nat. Phys.* **16**, 778 (2020)
116. Time-resolved formation of excited atomic and molecular states in XUV-induced nanoplasmas in ammonia clusters  
R. Michiels, A. C. LaForge, M. Bohlen, C. Callegari, A. Clark, A. von Conta, M. Coreno, M. Di Fraia, M. Drabbels, P. Finetti, M. Huppert, V. Oliver, O. Plekan, K. C. Prince, S. Stranges, V. Svoboda, **H. J. Wörner**, F. Stienkemeier  
*Phys. Chem. Chem. Phys.* **22**, 7828 (2020)
115. Simultaneous measurements of strong-field ionization and high harmonic generation in aligned molecules  
C. Marceau, J. B. Bertrand, P. Peng, **H. J. Wörner**, P. B. Corkum, D. M. Villeneuve  
*J. Phys. B: At. Mol. Opt. Phys.* **53**, 084006 (2020)
114. Femtosecond soft-X-Ray Absorption Spectroscopy of Liquids With a Water-Window High-Harmonic Source  
A. D. Smith, T. Balčiūnas, Y.-P. Chang, C. Schmidt, K. Zinchenko, F. B. Nunes, E. Rossi, V. Svoboda, Z. Yin, J.-P. Wolf, **H. J. Wörner**  
*J. Phys. Chem. Lett.* **11**, 1981 (2020)
113. The Ionization Energy of Liquid Water Revisited  
C. F. Perry, P. Zhang, F. B. Nunes, I. Jordan, A. von Conta, **H. J. Wörner**  
*J. Phys. Chem. Lett.* **11**, 1789 (2020)
112. Real-time observation of water radiolysis and hydrated electron formation induced by extreme-ultraviolet pulses  
V. Svoboda, R. Michiels, A. C. LaForge, J. Med, F. Stienkemeier, P. Slavíček, **H. J. Wörner**  
*Sci. Adv.* **6**, eaaz0385 (2020)
111. Alternative Approach for the Determination of Mean Free Paths of Electron Scattering in Liquid Water Based on Experimental Data  
A. Schild, M. Peper, C. Perry, D. Rattenbacher, **H. J. Wörner**  
*J. Phys. Chem. Lett.* **11**, 1128 (2020)
110. Real-time probing of chirality during a chemical reaction  
D. Baykusheva, D. Zindel, V. Svoboda, E. Bommeli, M. Ochsner, A. Tehlar, **H. J. Wörner**  
*PNAS* **116**, 23923 (2019)
109. Reconstruction of attosecond pulses in the presence of interfering dressing fields using a 100 kHz laser system at ELI-ALPS  
D. Hammerland, P. Zhang, S. Khn, P. Jojart, I Seres, V. Zuba, Z. Varallylay. D. Charalambidis, K. Osvay, T. T. Luu, **H. J. Wörner**  
*J. Phys. B: At. Mol. Opt. Phys.* **52**, 23LT01 (2019)

108. Electronic and vibrational relaxation dynamics of  $\text{NH}_3$  Rydberg states probed by vacuum-ultraviolet time-resolved photoelectron imaging  
V. Svoboda, Ch. Wang, M. D. J. Waters, **H. J. Wörner**  
*J. Phys. Chem* **151**, 104306 (2019)
107. The SwissFEL soft X-ray free-electron laser beamline: Athos  
R. Abela, A. Alarcon, J. Alex, C. Arrell, V. Arsov, S. Bettoni, M. Bopp, C. Bostedt, H.-H. Braun, M. Calvi, T. Celcer, P. Craievich, A. Dax, P. Dijkstal, S. Dordevic, E. Ferrari, U. Flechsig, R. Follath, F. Frei, N. Gaiffi, Z. Geng, C. Gough, N. Hiller, S. Hunziker, M. Huppert, R. Ischebeck, H. Jöhri, P. Juranic, R. Kalt, M. Kaiser, B. Keil, C. Kittel, R. Künzi, T. Lippuner, F. Löhler, F. Marcellini, G. Marinkovic, C. Okzan Loch, G. L. Orlandi, B. Patterson, C. Pradervand, M. Paraliev, M. Pedrozzi, E. Prat, P. Ranitovic, S. Reiche, C. Rosenberg, S. Sanfilippo, T. Schietinger, T. Schmidt, K. Schnorr, C. Svetina, A. Trisorio, C. Vicario, D. Voulot, U. Wagner, **H. J. Wörner**, A. Zandonella, L. Patthey and R. Ganter  
*J. Synchrotron Rad.* **26**, 1073-1084 (2019)
106. Complete characterisation of attosecond SXR pulses generated by MIR laser sources  
T. Gaumnitz, A. Jain, M. Huppert, I. Jordan, F. Ardana-Lamas and **H. J. Wörner**  
*EPJ Web of Conferences* **205**, 01021 (2019)
105. Real-Time Dynamics of the Formation of Hydrated Electrons upon Irradiation of Water Clusters with Extreme Ultraviolet Light  
A.-C. LaForge, R. Michiels, M. Bohlen, C. Callegari, A. Clark, A. von Conta, M. Coreno, M. Di Fraia, M. Drabbels, M. Huppert, P. Finetti, J. Ma, M. Mudrich, V. Oliver, O. Plekan, K.-C. Prince, M. Shcherbinin, S. Stranges, V. Svoboda, **H. J. Wörner**, F. Stienkemeier  
*Phys. Rev. Lett.* **122**, 133001 (2019)
104. Using a passively stable attosecond beamline for relative photoemission time delays at high XUV photon energies  
A. Jain, Th. Gaumnitz, A. Kheifets, **H. J. Wörner**  
*Opt. Exp.* **26**, 28604 (2018)
103. Observing broken inversion symmetry in solids using two-color high-order harmonic spectroscopy  
T. T. Luu, **H. J. Wörner**  
*Phys. Rev. A* **98**, 041802 (2018)
102. Photoionization delays in xenon using single-shot referencing in the collinear back-focusing geometry  
A. Jain, T. Gaumnitz, A. Bray, A. Kheifets, **H. J. Wörner**  
*Opt. Lett.* **43**, 4510 (2018)
101. Extreme-ultraviolet high-order harmonic generation from few-cycle annular beams  
T. Gaumnitz, A. Jain, **H. J. Wörner**  
*Opt. Lett.* **43**, 4506 (2018)
100. Extreme-ultraviolet high-harmonic generation in liquids  
T. T. Luu, Z. Yin, A. Jain, T. Gaumnitz, Y. Pertot, J. Ma, **H. J. Wörner**  
*Nat. Comm.* **9**, 3723 (2018)
99. Chiral Discrimination through Bielliptical High-Harmonic Spectroscopy  
D. Baykusheva and **H. J. Wörner**  
*Phys. Rev. X* **8**, 031060 (2018)
98. Conical-intersection dynamics and ground-state chemistry probed by extreme-ultraviolet time-resolved photoelectron spectroscopy  
A. von Conta, A. Tehlar, A. Schletter, Y. Arasaki, K. Takatsuka, **H. J. Wörner**  
*Nat. Comm.* **9**, 3162 (2018)
97. Ab initio calculation of femtosecond-time-resolved photoelectron spectra of  $\text{NO}_2$  after excitation to the A-band  
A. Tehlar, A. von Conta, Y. Arasaki, K. Takatsuka, **H. J. Wörner**  
*J. Chem. Phys.* **149**, 034307 (2018)



96. Nonlocal mechanisms of attosecond interferometry and implications for condensed-phase experiments  
D. Rattenbacher, I. Jordan, A. Schild, **H. J. Wörner**  
*Phys. Rev.* **97**, 063415 (2018)
95. Complete reconstruction of ultra-broadband isolated attosecond pulses including partial averaging over the angular distribution  
T. Gaumnitz, A. Jain, **H. J. Wörner**  
*Opt. Exp.* **26**, 14719 (2018)
94. Photoelectron spectrometer for liquid and gas-phase attosecond spectroscopy with field-free and magnetic bottle operation modes  
I. Jordan, A. Jain, T. Gaumnitz, J. Ma, **H. J. Wörner**  
*Rev. Sci. Instrum.* **89**, 053103 (2018)
93. High-order harmonic source spanning up to the oxygen K-edge based on filamentation pulse compression  
C. Schmidt, Y. Pertot, T. Balciunas, K. Zinchenko, M. Matthews, **H. J. Wörner**, J.-P. Wolf  
*Opt. Exp.* **26**, 11834-11842 (2018)
- 92a. Perspektiven für das Verständnis fundamentaler Elektronenkorrelationen durch Attosekundenspektroskopie  
P. M. Kraus, **H. J. Wörner**  
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J. B. Gong, **H. J. Wörner**, and P. Brumer  
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2. Multichannel quantum defect theory and high-resolution spectroscopy of the hyperfine structure of high Rydberg states of  $^{83}\text{Kr}$   
**H. J. Wörner**, U. Hollenstein, and F. Merkt  
*Phys. Rev. A* **68**, 032510: 1-16 (2003)
1. Coherent manipulation of quantum  $\delta$ -kicked dynamics: Faster-than-classical anomalous diffusion  
J. B. Gong, **H. J. Wörner**, and P. Brumer  
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#### BOOK CHAPTERS

5. Attosecond Dynamics in Liquids  
**H. J. Wörner**, A. Schild, D. Jelovina, I. Jordan, C. Perry, T. T. Luu, and Z. Yin  
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K. Ueda (eds.), Springer Nature (submitted) <https://arxiv.org/abs/2009.04913>
4. Attosecond Molecular Spectroscopy and Dynamics  
D. Baykusheva and **H. J. Wörner**  
in: *Molecular Spectroscopy and Quantum Dynamics* **Vol. 1**, 113-162  
R. Marquardt and M. Quack (eds.), Elsevier, Amsterdam (2020)  
<https://arxiv.org/abs/2002.02111>
3. Studying the electronic structure of molecules with high harmonic spectroscopy  
D. M. Villeneuve, J. B. Bertrand, P. B. Corkum, N. Dudovich, J. Itatani, J.-C. Kieffer, F. Légaré, J. Levesque, Y. Mairesse, H. Niikura, B. E. Schmidt, A. D. Shiner, and **H. J. Wörner**  
in: *Attosecond Physics*, Springer Series in Optical Sciences **Vol. 177**, 159-190  
L. Plaja, R. Torres, and A. Zair (eds.), Springer Verlag, Berlin (2013)
2. Attosecond spectroscopy  
**H. J. Wörner** and P. B. Corkum  
in: *Handbook of High-Resolution Spectroscopy* **Vol. 3**, 1781-1804  
F. Merkt and M. Quack (eds.), John Wiley & Sons, Chichester (2011)



1. Fundamentals of electronic spectroscopy  
**H. J. Wörner** and F. Merkt  
in: *Handbook of High-Resolution Spectroscopy* **Vol. 1**, 175-262  
F. Merkt and M. Quack (eds.), John Wiley & Sons, Chichester (2011)

INVITED TALKS BY  
H. J. WÖRNER

166. Attosecond Coincidence Spectroscopy: from linear to circular polarizations  
Atomic Physics 2022  
Dresden, Germany, November 28 - December 2, 2022
165. Attosecond spectroscopy on molecules, clusters and liquids  
RIKEN Center for Advanced Photonics  
RIKEN, Saitama, Japan, November 25, 2022
164. Attosecond spectroscopy of water: bridging the gas phase to the liquid phase  
Department of Chemistry, School of Science, the University of Tokyo  
Tokyo, Japan, November 24, 2022
163. Attosecond spectroscopy: bridging the gas and liquid phases  
Department of Chemistry, Graduate School of Science, Kyoto University  
Kyoto, Japan, November 22, 2022
162. Attosecond science on water: bridging gas phase to liquid phase  
International Workshop on Photoionization (IWP) Resonant Inelastic X-ray  
Scattering (RIXS) (IWP-RIXS 2022)  
Zao-cho, Japan, November 15-19, 2022
161. Advances in attochemistry  
8th International Conference on Attosecond Science  
Florida, USA, July 11-15, 2022
160. Attosecond spectroscopy: from isolated molecules over clusters to the liquid phase  
CECAM workshop: Challenges of Molecular Spectroscopy  
Lausanne, Switzerland, June 13-17, 2022
159. Attosecond soft-X-ray spectroscopy in the gas and liquid phases  
WaveMix workshop  
Online, June 13-15, 2022
158. Attosecond spectroscopy and dynamics  
New Horizon Lecture in Chemistry, Solvay Institutes  
Brussels, Belgium, June 14, 2022
157. Attosecond spectroscopy: watching electrons in action  
20 years of CINSaT workshop  
Kassel, Germany, June 2, 2022
156. Attosecond soft-X-ray spectroscopy in the gas and liquid phases  
CLEO-US tutorial lecture  
Hybrid (San Jose, USA/Online), May 15-20, 2022
155. Attosecond photoemission dynamics from molecules, clusters and liquids  
Spring meeting of the Korean Physical Society  
Online, April 18-22, 2022
154. Attosecond soft-X-ray spectroscopy in the gas and liquid phases  
Scientific Opportunities with Advanced Attosecond Lasers  
Hybrid (Dongguan, China/Online), January 15-18, 2022
153. Attosecond soft-X-ray spectroscopy of charge migration and chemical reactions  
Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw, Poland  
Online, January 12, 2022
152. Probing chiral dynamics on femtosecond and attosecond time  
The International Chemical Congress of Pacific Basin Societies 2021 (Pacifichem  
2021)  
Online, December 16-21, 2021
151. Attosecond soft-X-ray spectroscopy of charge migration and chemical reactions  
7th Theme Meeting on Ultrafast Science - 2021 (UFS-2021)  
Hybrid (Mumbai, India/Online), November 12-14, 2021
150. Attosecond soft-X-ray spectroscopy in the Gas and Liquid Phases  
The Frontiers in Optics + Laser Science Conference (FiO LS)  
Online, November 1-4, 2021

149. Time-resolved soft-X-ray spectroscopy in the gas and liquid phases  
Workshop on 1D imaging soft-X-ray spectroscopy at the SQS instrument of the EuXFEL  
Online, October 19, 2021
148. Attosecond soft-X-ray and high-harmonic spectroscopies: bridging the complexity  
New Horizons Solvay Lectures in Chemistry  
Online, October 19, 2021
147. Attosecond time delays in molecules, clusters and liquids: towards electronic  
New Horizons Solvay Lectures in Chemistry  
Online, October 12, 2021
146. Attosecond charge migration and its interaction with nuclear motion: towards  
attochemistry  
New Horizons Solvay Lectures in Chemistry  
Online, October 5, 2021
145. Attosecond Coincidence Spectroscopy of Liquids and Clusters  
SSRL/LCLS Users Meeting  
Online, September 20-24, 2021
144. Probing electron hole delocalization through core-level attosecond chronoscopy  
LCLS online Presentation of beamtime LW 94  
Online, September 20, 2021
143. Attosecond charge migration and its interaction with nuclear motion: towards  
attochemistry  
International Conference on Photochemistry - 30th Edition (ICP 2021)  
Online, July 19-23, 2021
142. Attosecond photoionization dynamics of molecules, clusters and liquid water  
International Max-Planck Research School  
Online, March 24, 2021
141. Attosecond Soft-X-ray Spectroscopy in the Gas and Liquid Phases  
Advances in Atomic, Molecular and Optical Sciences 2020 (AAMOS20)  
Online, December 14-18, 2020
140. Attosecond Soft-X-ray Spectroscopy in the Gas and Liquid Phases  
International Conference on X-Ray Laser 2020 (ICXRL 2020)  
Online, December 8-10, 2020
139. Attosecond Soft-X-ray Spectroscopy in the Gas and Liquid Phases  
Attochem First Annual Workshop of the Cost Action CA18222, Attochemistry  
Online, September 9-11, 2020
138. Attosecond Photoemission Dynamics from molecules, clusters and liquids  
ELISS, Summer School of the ELI-ALPS summer research school  
Online, August 26-28, 2020
137. Attosecond Soft-X-ray Spectroscopy in the Gas and Liquid Phases  
Virtual DAMOP meeting of the American Physical Society  
Online, June 1-5, 2020
136. Attosecond soft-X-ray spectroscopy in the gas and liquid phases  
SFB-Kolloquium 1242, Universitt Duisburg-Essen  
Duisburg, Germany, January 28, 2020
135. Probing chiral dynamics on femtosecond and attosecond time scales  
SFB-Seminar, Universitt Kassel  
Kassel, Germany, January 21, 2020
134. Attosecond soft-X-ray spectroscopy in the gas and liquid phases  
Seminar Lecture at the National Research Council of Canada  
Ottawa, Canada, December 23, 2019
133. RABBIT and attosecond interferometry using the 100 kHz HR1 laser at ELI-ALPS  
7th ELI-ALPS User Workshop  
Szeged, Hungary November 7-8, 2019

132. Attosecond Soft X-Ray Spectroscopy in the Gas and Liquid Phases  
55th Symposium on Theoretical Chemistry (STC2019)  
Rostock, Germany, September 22-26, 2019
131. Attosecond X-ray spectroscopy in the gas and liquid phases  
Beating the Complexity of Matter through the Selectivity of X-rays - Dynamic Pathways in Multidimensional Landscapes (SXR 2019)  
Berlin, Germany, September 16-20, 2019
130. Attosecond dynamics of electrons in liquids  
International Symposium on Ultrafast Intense Laser Science (ISUILS 2019)  
Kushiro, Japan, August 4-9, 2019
129. Attosecond X-ray spectroscopy in the gas and liquid phases  
Seminar Lecture at East China Normal University  
Shanghai, China, August 2, 2019
128. Attosecond dynamics of electrons in liquids  
14th Femtochemistry Conference (FEMTO 14)  
Shanghai, China, July 28 August 2, 2019
127. Attosecond soft-X-ray spectroscopy in the gas and liquid phases  
5th International Symposium on Intense Short Wavelength Processes in Atoms and Molecules (ISWAMP)  
Paris, France, July 20-22, 2019
126. Measuring electron dynamics in molecules  
Seminar Lecture at the University of Central Florida  
Orlando, USA, April 2, 2019
125. Attosecond dynamics of electrons in liquids  
ACS Spring 2019 National Meeting  
Orlando, USA, March 31-April 4, 2019
124. Extending attosecond spectroscopy to complex systems: from molecules to liquids  
LPI  
Moscow, Russia, March 22, 2019
123. Measuring electronic dynamics in molecules on attosecond time scales  
MIPT  
Moscow, Russia, March 19, 2019
122. Probing chirality on femtosecond and attosecond time scales  
Seminar of the Department of Chemistry  
The University of Tokyo, Japan, January 25, 2019
121. Attosecond dynamics in molecules and liquids  
Seminar of the Department of Chemistry  
The University of Kyoto, Japan, January 24, 2019
120. Attosecond spectroscopy of molecules and liquids  
University of Tokyo – ETH Zurich Strategic Partnership Symposium on the UN sustainable development goals and innovation  
The University of Tokyo, Japan, January 21, 2019
119. Attosecond dynamics in liquids  
Atomic Physics Workshop  
Dresden, Germany, November 27-30, 2018
118. Probing chiral dynamics on femtosecond and attosecond time scales  
MOLIM 2018  
Athens, Greece, October 8-10, 2018
117. Attosecond dynamics in the liquid phase  
UFDIM 2018  
Agios Nikolaos, Greece, September 29-October 4, 2018
116. Probing chiral dynamics on femtosecond and attosecond time scales  
Stereodynamics 2018  
Arosa, Switzerland, September 2-7, 2018

115. Probing chemical dynamics by soft-X-ray transient absorption and XUV photoelectron spectroscopy  
256th ACS National Meeting  
Boston, USA, August 19-23, 2018
114. Probing chemical dynamics by soft-X-ray transient absorption and XUV photoelectron spectroscopy  
13th Nordic Femtochemistry  
Copenhagen, Denmark, August 16-17, 2018
113. Attosecond science in the liquid phase  
XXI International Conference on Ultrafast Phenomena  
Hamburg, Germany, July 15-20, 2018
112. Observing electronic dynamics in molecules  
Photon Science Colloquium  
Hamburg, Germany, July 13, 2018
111. Attosecond time-resolved molecular spectroscopy  
Coblentz Award Lecture  
Urbana-Champaign, USA, June 20, 2018
110. An attosecond look at liquid water  
49th Annual DAMOP meeting, American Physical Society  
Fort Lauderdale, USA, May 28 - June 1, 2018
109. Fundamental chemical dynamics  
NCCR MUST Site Visit  
ETH Zurich, Switzerland, May 16-17, 2018
108. Attosecond dynamics of electrons in molecules and liquids  
GRC Photoionization and Photodetachment. From Attoseconds to Nanoseconds: The Chemistry and Physics of Electrons, Atoms, Molecules and Light  
Galveston, USA, February 18-23, 2018
107. Attosecond science in the liquid phase  
Colloquium, Max-Born-Institute  
Berlin, Germany, January 31, 2018
106. Attosecond dynamics in molecules and liquids: present and future perspectives  
Scientific opening of ELI-ALPS)  
Szeged, Hungary, November 9, 2017
105. Attosecond electron dynamics in molecules and liquids  
International Conference on Extreme Light (ICEL2017)  
Szeged, Hungary, November 5-9, 2017
104. Measuring electronic dynamics in molecules - from the infrared to soft-X-rays  
International Symposium on Ultrafast Intense Laser Science (ISUILS)  
Lijiang, China, October 29 - November 3, 2017
103. Attosecond electron dynamics in molecules and liquids  
Scientific Opportunities with Electron Spectroscopy and RIXS, Helmholtz-Zentrum Berlin  
Berlin, Germany, October 16-18, 2017
102. Attosecond dynamics in isolated molecules and liquids  
Colloquium of Physical and Theoretical Chemistry (PC/TC), Freie Universitt Berlin  
Berlin, Germany, September 28, 2017
101. Attosecond soft-X-ray spetroscopy of molecules and liquids  
2nd European Conference of Physical Chemistry (ECPC17)  
Borgo, Corsica, France, September 24-27, 2017
100. New opportunities for molecular physics using high-harmonic and FEL light sources  
Joint Annual Meeting 2017, Swiss Physical Society  
Geneva, Switzerland, August 22, 2017

99. Attosecond electron dynamics in molecules and liquids  
30th International Conference on Photonic, Electronic and Atomic Collisions (ICPEAC 2017)  
Cairns, Australia, July 25 - August 1, 2017
98. Attosecond delays in molecular photoionization  
CLEO/Europe-EQEC 2017, ICM Munich  
Munich, Germany, June 25-29, 2017
97. Attosecond time-resolved photoelectron spectroscopy of liquids  
CLEO/Europe-EQEC 2017, ICM Munich  
Munich, Germany, June 25-29, 2017
96. Attosecond dynamics of electrons in molecules and liquids  
33rd Symposium on Chemical Kinetics and Dynamics (SCKD)  
Nagoya, Japan, June 7-9, 2017
95. Attosecond science with gases and liquids: from the extreme ultraviolet to soft X-rays  
Seminar of Chemistry, Kyoto University  
Kyoto, Japan, June 6, 2017
94. Charge migration and charge transfer in molecular systems  
NCCR MUST Site Visit, ETH Zurich  
Zurich, Switzerland, May 22-23, 2017
93. Attosecond electron dynamics in molecules and liquids  
International Workshop on Photoionization (IWP) / Resonant Inelastic X-ray Scattering (RIXS)  
Aussois, France, March 26-31, 2017
92. Attosecond electron dynamics in molecules and liquids  
APS March Meeting  
New Orleans, USA, March 13-17, 2017
91. Measuring attosecond electron dynamics in molecules and liquids  
International Symposium on Ultrafast Dynamics in Molecular and Material Sciences  
Okazaki, Japan, March 6-9, 2017
90. Attosecond time-resolved spectroscopy of liquid water  
QUTIF March Meeting  
Dresden, Germany, February 27 - March 1, 2017
89. Probing the dynamics of molecular valence-shell electrons: from infrared to soft X-rays  
Seminar talk, Department of Chemistry, Tokyo University  
Tokyo, Japan, January 27, 2017
88. Attosecond electron dynamics in molecules and liquids  
ETHZ-UTokyo Strategic Partnership Symposium on Science, Design, Manufacturing and Information, Tokyo University  
Tokyo, Japan, January 19-20, 2017
87. Attosecond dynamics of electrons in molecules and liquids  
Colloquium of the Physics Institute, University of Kassel  
Kassel, Germany, December 1, 2016
86. Attosecond charge migration  
MEDEA Summer School, Ultrafast dynamics with intense radiation sources  
Agios Nikolaos, Greece, October 18-21, 2016
85. Attosecond spectroscopy  
QUTIF research school, University of Rostock  
Rostock, Germany, September 26-30, 2016
84. Attosecond spectroscopy: watching electrons in motion  
Fall Meeting of the Swiss Chemical Society (SCS), ETH Zurich  
Zurich, Switzerland, September 15, 2016
83. Attosecond dynamics of electrons in molecules and liquids  
Ueda Laboratory, Tohoku University  
Sendai, Japan, Aug 1, 2016

82. Attosecond science with gases and liquids: from the extreme ultraviolet to soft X-rays  
RIKEN International Symposium on Attosecond Science, University of Tokyo  
Tokyo, Japan, July 30, 2016
81. Attosecond science with gases and liquids: from the extreme ultraviolet to soft X-rays  
Seminar, Kyoto University  
Kyoto, Japan, July 28, 2016
80. Attosecond dynamics of electrons in molecules and liquids  
25<sup>th</sup> Annual International Laser Physics Workshop (LPHYS)  
Yerevan, Armenia, July 11-15, 2016
79. Probing the dynamics of the molecular valence shell: from the infrared to soft X-rays  
Gordon Research Conference (GRC): Multiphoton Processes  
Andover, USA, June 19-24, 2016
78. Attosecond science: from gases to liquids and from the extreme-ultraviolet to soft X-rays  
Institut National de la Recherche Scientifique  
Varennnes, Canada, June 16, 2016
77. Attosecond science: from gases to liquids and from the extreme-ultraviolet to soft X-rays  
Conférence départementale, University of Sherbrooke  
Sherbrooke, Canada, June 15, 2016
76. Attosecond science: from gases to liquids and from the extreme-ultraviolet to soft X-rays  
National Research Council Canada  
Ottawa, Canada, June 14, 2016
75. Attosekunden-Spektroskopie: wie bewegen sich Elektronen in der Materie?  
Sommerplenum der Jungen Akademie  
Berlin, Germany, June 11, 2016
74. Attosecond dynamics of electrons in molecules and liquids  
The 47<sup>th</sup> Regular Meeting of the APS Division of Atomic, Molecular and Optical Physics (DAMOP)  
Providence, USA, May 23-27, 2016
73. Attosecond time-resolved photoelectron spectroscopy of liquids  
WE Heraeus Workshop  
Les Houches, France, May 8-13, 2016
72. Kurz, kürzer, Attosekunden: Wie bewegen sich Elektronen in der Materie?  
Carus Award Ceremony, Leopoldina  
Schweinfurt, Germany, April 26, 2016
71. Attosecond dynamics of photoionization: from atoms to the liquid phase  
20<sup>th</sup> Symposium on Atomic, Cluster and Surface Physics (SASP)  
Davos, Switzerland, February 7-12, 2016
70. Attosecond science in the liquid phase  
QUTIF Kickoff-Meeting, Leibniz Universität  
Hannover, Germany, November 29 - December 1, 2015
69. Attosecond measurements in the liquid phase  
International Workshop on Atomic Physics  
Dresden, Germany, November 23-27, 2015
68. Attosekundenspektroskopie: Wie bewegen sich Elektronen in Molekülen?  
Diskussionsforum, Sternwarte  
Zurich, Switzerland, October 30, 2015
67. Attosecond charge migration in molecules and liquids  
Colloquium Laboratoire de Chimie Physique-Matière et Rayonnement  
Paris, France, October 13, 2015
66. Attosecond Photoionization Delays from the Liquid Phase  
3<sup>rd</sup> International Conference on "Correlation Effects in Radiation Fields" (CERF)  
Rostock, Germany, September 13-18, 2015

65. Controlled attosecond electron dynamics of molecules  
Gordon Research Conference on Quantum Control of Light & Matter  
South Hadley (Massachusetts), USA, August 2-7, 2015
64. Measurement and control of attosecond charge migration  
12<sup>th</sup>Femtochemistry Conference (FEMTO12)  
Hamburg, Germany, July 12-17, 2015
63. Attosecond charge migration and its laser control  
5<sup>th</sup> International Conference on Attosecond Physics (ATTO 2015)  
Saint-Sauveur (Québec), Canada, July 6-10, 2015
62. Controlled attosecond dynamics in molecules  
Colloquium at the Institute of Physics, University of Rostock  
Rostock, Germany, June 11, 2015
61. High-harmonic spectroscopy of attosecond quantum dynamics  
XVIIth International Workshop on Quantum Atomic and Molecular Tunneling in  
Solids and Other Phases (QAMTS 2015)  
Beatenberg, Switzerland, May 31 - June 3, 2015
60. Attosecond high-harmonic spectroscopy  
IMPRS Max-Planck-Institute for Quantum Optics  
Garching, Germany, June 1, 2015
59. Attosecond charge migration and its laser control  
International Workshop on Atomic Physics  
Dresden, Germany, November 24-28, 2014
58. Attosecond charge migration and its laser control (plenary lecture)  
International Workshop of Strong-Field Physics and Ultrafast Phenomena  
Zhangjiajie, China, October 31 - November 4, 2014
57. Time-resolved photoelectron spectroscopy with liquid microjets  
Extreme Light Infrastructure – Attosecond Light Pulse Source (ELI-ALPS) 2<sup>nd</sup> User  
Workshop, Szeged, Hungary, September 11-12, 2014
56. The sensitivities of high-harmonic generation and strong-field ionization to coupled  
electronic and nuclear dynamics  
Emerging Photon Technologies for Chemical Dynamics, Faraday Discussion 171  
Sheffield, UK, July 9-11, 2014
55. Dynamics of electrons and holes measured by high-harmonic spectroscopy  
45<sup>th</sup> Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics  
Madison (Wisconsin), USA, June 2-6, 2014
54. Measuring electronic dynamics of molecules by high-harmonic spectroscopy  
Gordon Research Conference on Photoionization & Photodetachment  
Galveston (Texas), USA, February 23-28, 2014
53. High-harmonic spectroscopy of electronic dynamics in molecules  
International Workshop on Theory of Attosecond Quantum Dynamics  
Tokyo, Japan, January 20 - February 14, 2014
52. Electronic dynamics of molecules probed by high-harmonic spectroscopy  
Leopoldina-Symposium “Spectroscopy and Molecular Dynamics at the Limit”  
ETH Zurich, Switzerland, September 11-13, 2013
51. Probing electronic structure and dynamics with high-harmonic spectroscopy  
32<sup>nd</sup> International Symposium on Free Radicals  
Potsdam, Germany, July 21-26, 2013
50. Time-resolved spectroscopy of electronic dynamics in molecules  
Physical Chemistry Seminar  
University of Graz, Austria, June 6, 2013
49. Time-resolved spectroscopy of electronic quantum dynamics in molecules  
Minisymposium Molecular Kinetics and Dynamics  
ETH Zurich, Switzerland, June 3-4, 2013



48. Time-resolved spectroscopy of electronic quantum dynamics in molecules  
Physical Chemistry Seminar  
University of Liege, Belgium, May 21, 2013
47. Coherent spectroscopy of electronic dynamics in molecules  
(Nernst-Haber-Bodenstein Prize lecture)  
112<sup>th</sup> Bunsentagung (Annual German Conference on Physical Chemistry)  
Karlsruhe Institute of Technology (KIT), Germany, May 9-11, 2013
46. High-harmonic spectroscopy of molecular quantum dynamics  
Seminar at the Max Born Institute  
Berlin, Germany, February 27, 2013
45. Time-resolved spectroscopy of electronic quantum dynamics  
Spring Meeting of the Swiss Association of Computational Chemists  
Berne, Switzerland, February 15, 2013
44. Probing electronic dynamics and coherence through attosecond pulse generation  
Workshop on Quantum Biology  
Lund, Sweden, December 10, 2012
43. Time-resolved spectroscopy of electronic quantum dynamics  
Ruzicka Prize Lecture  
ETH Zurich, Switzerland, December 6, 2012
42. Probing electronic dynamics and coherence with high-harmonic spectroscopy  
International Workshop on Atomic Physics  
Dresden, Germany, November 26-30, 2012
41. Wie bewegen sich Elektronen in Molekülen? Zeitaufgelöste Spektroskopie mit hohen Harmonischen  
Göttingen Academy of Sciences and Humanities  
Göttingen, Germany, November 16, 2012
40. Probing the evolution of molecular electronic structure in photochemical reactions  
(Grammaticakis-Neumann Prize lecture)  
Fall Meeting of the Swiss Chemical Society (SCS)  
ETH Zurich, Switzerland, September 13, 2012
39. Time-resolved high-harmonic spectroscopy of valence electron dynamics  
International Workshop on Attosecond Science and Strong-Field Physics  
Aarhus, Denmark, September 6-7, 2012
38. Probing valence-shell electron dynamics in molecules with high-harmonic spectroscopy  
RIKEN Brain Science Institute  
Wako (Saitama), Japan, August 31, 2012
37. Probing electronic dynamics in molecules with high-harmonic spectroscopy  
Tokyo University, Japan, August 30, 2012
36. Conical intersection dynamics probed by high-harmonic spectroscopy  
XXI<sup>st</sup> International Symposium on the Jahn-Teller Effect  
University of Tsukuba, Japan, August 26-31, 2012
35. High-harmonic spectroscopy of electron dynamics in molecules (progress report)  
44<sup>th</sup> Conference of the European Group on Atomic Systems (EGAS)  
University of Gothenburg, Sweden, July 9-13, 2012
34. Probing electronic coherence and dynamics with high-harmonic spectroscopy  
Ultrafast Dynamic Imaging of Matter Conference (UDIM 2012)  
Banff (Alberta), Canada, July 1-3, 2012
33. Probing electronic valence shell dynamics in molecules  
Annual Meeting of the Swiss Physical Society  
Zurich, Switzerland, June 21-22, 2012

32. Dynamique électronique moléculaire sondée par spectroscopie à génération d'harmoniques élevées  
Colloquium UVX 2012  
Biarritz, France, June 12-15, 2012
31. Attosecond spectroscopy of electron dynamics in molecules  
Young Faculty Meeting 2012  
Berne, Switzerland, June 7, 2012
30. Coherent high-harmonic spectroscopy of electron dynamics in molecules  
KIP Colloquium  
Heidelberg University, Germany, January 18, 2012
29. Probing electronic dynamics in molecules with high-harmonic generation  
NCCR MUST Annual Meeting (National Center of Competence in Research - Molecular Ultrafast Science and Technology)  
Lenk, Switzerland, January 8-12, 2012
28. Probing electronic dynamics in molecules with high-harmonic spectroscopy (plenary lecture)  
Annual Meeting of the Spectroscopy and Dynamics Interest Group of the Royal Society of Chemistry  
University of Leicester, UK, January 4-6, 2012
27. Coherent high-harmonic spectroscopy of valence electron dynamics in molecules  
EPFL Lausanne, Switzerland, December 9, 2011
26. Coherent high-harmonic spectroscopy of valence electron dynamics in molecules  
International Workshop on Atomic Physics  
Dresden, Germany, November 20-25, 2011
25. Time-resolved high-harmonic spectroscopy of chemical dynamics  
AMO Seminar  
Aarhus, Denmark, October 6, 2011
24. Time-resolved high-harmonic spectroscopy of chemical reactions (plenary lecture)  
22<sup>nd</sup> Colloquium on High-Resolution Molecular Spectroscopy (HRMS 2011)  
Dijon, France, August 29 - September 2, 2011
23. High-harmonic spectroscopy of valence electron dynamics in chemical reactions  
The Madrid Conference on Femtochemistry (FEMTO 10)  
Madrid, Spain, July 10-15, 2011
22. Conical intersection dynamics probed by homodyne high-harmonic spectroscopy  
42<sup>nd</sup> Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics  
Atlanta (Georgia), USA, June 13-17, 2011
21. Time-resolved high-harmonic spectroscopy of chemical dynamics  
International Workshop on Photoionization (IWP)  
Las Vegas (Nevada), USA, May 22-27, 2011
20. High-harmonic spectroscopy of ultrafast molecular dynamics  
Workshop on Quantum Effects on Ultrashort Time Scales  
Leysin, Switzerland, May 18-21, 2011
19. Time-resolved high-harmonic spectroscopy: Femtosecond and attosecond dynamics in molecules  
Physical Chemistry Colloquium  
University of Geneva, Switzerland, May 5, 2011
18. Time-resolved high-harmonic spectroscopy: Femtosecond and attosecond dynamics in molecules  
Physical Chemistry Colloquium  
EPFL Lausanne, Switzerland, April 21, 2011
17. Femtosecond and attosecond dynamics probed by high-harmonic spectroscopy  
Physical Chemistry Colloquium  
University of Basel, Switzerland, March 30, 2011

16. Ultrakurze Laserpulse: Eine Stoppuhr für Elektronen  
Inaugural Lecture  
ETH Zurich, Switzerland, March 28, 2011
15. Time-resolved high-harmonic spectroscopy of photochemical dynamics  
Frontiers in Optics (FiO) 2010 / Laser Science (LS) XXVI  
Rochester (New York), USA, October 24-28, 2010
14. Time-resolved high-harmonic spectroscopy: Photodissociation, conical intersections and nonadiabatic dynamics  
Physical Chemistry Colloquium  
ETH Zurich, Switzerland, October 12, 2010
13. Following chemical reactions using high-harmonic spectroscopy  
15<sup>th</sup> Gordon Research Conference on Multiphoton Processes  
Tilton (New Hampshire), USA, June 6-11, 2010
12. Following chemical reactions using high-harmonic interferometry  
Colloquium of the Physics Department  
Kansas State University, Manhattan (Kansas), USA, February 8, 2010
11. Following a chemical reaction using homodyne high-harmonic spectroscopy  
Gordon Research Conference on Photoions, Photoionization and Photodetachment  
Galveston (Texas), USA, January 31 - February 5, 2010
10. Following chemical reactions using high-harmonic spectroscopy  
Seminar at the Max Born Institute  
Berlin, Germany, January 21, 2010
9. Attosecond homodyne interferometry of a chemical reaction  
18<sup>th</sup> International Laser Physics Workshop (LPHYS 09)  
Barcelona, Spain, July 13-17, 2009
8. Observing molecular dynamics using high-harmonic generation  
14<sup>th</sup> Gordon Research Conference on Multiphoton Processes  
Tilton (New Hampshire), USA, June 8-13, 2008
7. Role of nuclear spins in atomic and molecular photoionization  
7<sup>th</sup> International Conference on Dissociative Recombination: Theory, Experiments and Applications (DR 2007)  
Ameland, The Netherlands, July 18-23, 2007
6. L'effet Jahn-Teller dans  $\text{CH}_4^+$  caractérisé par spectroscopie photo-électronique à haute résolution  
Seminar at the Laboratory Aimé Cotton (LAC) of the National Center for Scientific Research (CNRS)  
Paris-Sud University, Orsay, France, April 26, 2007
5. High-resolution photoelectron studies of  $\text{CH}_4^+$  and  $\text{C}_5\text{H}_5^+$   
Seminar at the Chemistry Department  
University of Waterloo, Canada, March 23, 2007
4. High-resolution photoelectron spectroscopic studies of molecular cations  
National Research Council of Canada  
Ottawa, Canada, March 20, 2007
3. The Jahn-Teller effect in  $\text{CH}_4^+$  and isotopomers characterized by high-resolution photoelectron spectroscopy  
Competence Centre for Computational Chemistry (C4) Workshop  
ETH Zurich, Switzerland, January 4, 2007
2. High-resolution spectroscopic studies of non-Born-Oppenheimer effects  
Physical Chemistry Colloquium  
ETH Zurich, Switzerland, November 14, 2006
1. The Jahn-Teller effect in  $\text{CH}_4^+$ : Rovibronic structure and the role of the geometric phase  
Seminar of Physical and Theoretical Chemistry  
University of Oxford, UK, March 29, 2006