

## PROF. MICHAEL W. ZUERCH

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## CURRICULUM VITAE

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### RESEARCH INTERESTS

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#### **Experimental investigation of structure and dynamics of complex, correlated solid-state materials:**

Specific areas of interest are the observation and control of: (1) Collective phenomena between entities such as excitons, magnons and phonons, (2) Chemical material dynamics at surfaces and interfaces, (3) Symmetry-broken states and their emergence, and (4) Dynamical properties in artificial and correlated superlattices. To this end, my group develops new physical chemistry methods to directly measure and manipulate such systems away from equilibrium and push the limits of temporal and spatial resolution at the molecular level.

### CURRENT POSITIONS

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- 2019-present **Assistant Professor of Chemistry**, University of California at Berkeley, Department of Chemistry
- 2020-present **Faculty Scientist**, Lawrence Berkeley National Laboratory, Materials Sciences Division

### PREVIOUS POSITIONS

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- 2018-2019 **Independent Max Planck Research Group Leader (W2)**, Fritz Haber Institute of the Max Planck Society, Department of Physical Chemistry, Berlin, Germany
- 2017-2018 **Independent Junior Research Group Leader**, Friedrich Schiller University Jena, Institute of Optics and Quantumelectronics and Abbe Center of Photonics
- 2015-2017 **Feodor Lynen Post-doctoral Fellow**, University of California at Berkeley, Chemistry Department. (Groups of Daniel M. Neumark and Stephen R. Leone)
- 2014-2015 **Post-doctoral Scientific Research Assistant**, Friedrich Schiller University Jena, Institute of Optics and Quantumelectronics and Abbe Center of Photonics (Group of Christian Spielmann)
- 2010-2014 **Graduate Scientific Research Assistant**, Friedrich Schiller University Jena, Institute of Optics and Quantumelectronics and Abbe Center of Photonics (Group of Christian Spielmann)

### EDUCATION

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- 07/2014 **Doctorate (Dr. rer. nat.)** in physics at Friedrich Schiller University Jena, finished with distinction (*summa cum laude*). (Adviser: Christian Spielmann)
- 09/2010 **Diploma (Dipl.-Phys., M. Sc. equivalent)** in physics at Friedrich Schiller University Jena, finished with distinction.

### SUMMARY OF INVITED LECTURES AND SEMINARS

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Dr. Zuerch gave more than 53 invited presentations at international conferences and invited lectures including departmental seminars at Stanford, MIT, Princeton, Caltech, Columbia among other reputable institutions across the US, and colloquia such as the *Nobel Colloquium* on attosecond science at Northeastern University.

### SUMMARY OF MENTORING:

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12 undergraduate students, 11 graduate students, and 3 post-docs were advised and mentored in the Zuerch Lab since 2019. 15 group members have a background underrepresented in STEM.

### SUMMARY OF PUBLICATIONS:

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Dr. Zuerch has 65 publications in peer-reviewed outlets including proceedings and book chapters. Since his start at Berkeley, his group has published 28 manuscripts in peer-reviewed journals, out of which he is lead senior and/or corresponding author on 13. Out of those 13 publications, 7 have been published within Science and Nature family journals and 3 in PRL and JACS.

## AWARDS AND HONORS

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2023	DOE Early Career Award, Department of Energy
2023	Technical Development Award, Japan Society of Vacuum and Surface Science
2023	Invited Committee Member <i>Basic Research Needs (BRN) Workshop on the Future of Laser Technology</i>
2022	Emerging Researcher in Physical Chemistry, Journal in Physical Chemistry C
2021	Berkeley Collegium Award for Advancing Research-near Undergraduate Education
2021	Hellman Fellowship, Hellman Fellows Fund
2021	Fresnel Prize, European Physical Society, Quantum Electronics and Optics Division
2020	W. M. Keck Foundation Science and Engineering Research Award
2020	Innovation Award, Booz Allen Foundation
2018	Max Planck Research Group, Max Planck Society
2018	Feodor Lynen Alumni Fellowship, Alexander von Humboldt Foundation
2015	Feodor Lynen Fellowship, Alexander von Humboldt Foundation
2015	Reichart-Prize 2015, Academy of Sciences and Humanities in Erfurt (Akademie der gemeinnützigen Wissenschaften zu Erfurt)
2015	Dr.-Ing. Siegfried Werth Dissertation Award, Dr.-Ing. Siegfried Werth Foundation
2015	Finalist Dissertation Award of the German Physical Society
2014	Springer Theses Dissertation Award
2010	Best diploma thesis award of the Faculty of Physics and Astronomy, FSU Jena

## PROFESSIONAL SERVICE

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2022-present	Member of International Program Committee (IPC) of the ATTO Conference
2022-present	Stanford Linear Accelerator, Proposal Review Panel, HCM Board
2021-present	Editorial Board member <i>Discover Nano</i> (Springer-Nature)
2023	Panel member for Ultrafast Science at <i>Basic Research Needs (BRN) Workshop on Future of Laser Technology</i> , DOE/DOD/NSF
2023	EPS-QEOD Prize Committee, European Physical Society
2022	Panelist in Surface Chemistry and Interfaces on advisory committee NEXUS facility at Ohio State University
2021	Senior Assistant Dean-Facilities Search Committee member
2021	Scientific Board Member <i>Make Our Planet Great Again Conference: Climate, Energy and Earth System Technology</i> , Strasbourg, France
2020	Workshop organization committee <i>Exploring dynamics and equilibria across time and length scales at Charter Hill</i> , LBNL
last 4 years	<b>Peer-reviewing of scientific manuscripts:</b> Nature Photonics, Physical Review X, JACS, Light: Science and Applications, Science Advances, Nature Scientific Reports, Nano Letters, Optica, Physical Review Letters, Optics Letters, Journal of Physics, Applied Sciences
last 4 years	<b>Grant reviewing:</b> NSF, DOE, Beckman Foundation, U.S. Army Corps of Engineers, ETH Zurich Research Grant Program, German Science Foundation, Humboldt Foundation

## DEPARTMENTAL AND CAMPUS SERVICE

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2023-present	Head Graduate Advisor of Applied Science and Technology (AS&T) program, UC Berkeley
2022-present	Executive Committee member of Applied Science and Technology (AS&T) program, UC Berkeley
2020-present	Vice-Chair, <i>Non-ionizing Radiation Safety Committee (NIRSC)</i> , UC Berkeley
2020-2022	Graduate Admission Committee, Department of Chemistry at UC Berkeley
2021-2022	Physical Chemistry Seminar Committee Chair
2019-2021	<i>Chemistry Graduate Life Committee</i> faculty member, College of Chemistry at UC Berkeley

since 2019	Chaired 8 Qualifying Exam Committees, Member on 12 Qualifying Exam Committees
since 2019	Outside Member to 2 Physics and 1 Materials Engineering Qualifying Exams

## OUTREACH & ENGAGEMENT

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Regular	Michael and lab members are actively participating in the following programs: Bay Area Scientists in Schools (BASIS), Berkeley Splash, classroom teaching at El Cerrito High School (Large proportion of URM and economically disadvantaged students)
2023-current	Initiator and Director of Summer Undergraduate Research Fellowship program, <i>California Interfacial Science Institute</i>
2020-current	Host in NSF-REU and DOE SULI programs (on average 2 students with URM background per year)
2020	Founding member of <i>Shield the Bay</i> Group 3D printing and deploying PPE in local county hospitals during COVID19 pandemic. Supplied thousands of face shields to hospitals, raised \$16,000 in donations, established sustainable model where local hospitals and schools can acquire locally injection-molded PPE at material cost when needed. Established non-profit collaboration with black-owned business in Oakland, CA, to sustain the availability. Project awarded Innovation Award by Booz Allen Foundation (21 winners out of >2900 applications) for sustainable effort of community support during the pandemic.
2015-2017	Instructor in Research Experience for Teachers (RET) program at UC Berkeley

## PROFESSIONAL SOCIETY MEMBERSHIPS

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ACS, APS, MRS, Royal Society of Chemistry, German Physical Society, Optica

## ARTICLES ACCEPTED/SUBMITTED

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V. Korolev<sup>†</sup>, T. Lettau<sup>†</sup>, V. Krishna, A. Croy, **M. Zuerch**, C Spielmann, U. Pesche, S. Gräfe, G. Soavi and D. Kartashov. Wavelength dependence reveals the origin of the dephasing in high-order harmonic generation in solids, *submitted arXiv:2401.12929* (2024). <sup>†</sup>*Equal contribution*.

R. Geneaux, H.-T. Chang, A. Guggenmos, R. Delaunay, F. Legare, K. Legare, J. Luning, T. Parpiiev, I. J. Porter, B. R. de Roulet, **M. W. Zuerch**, S. Sharma, M. Schultze, and S. R. Leone. Spin injection across metallic layers at the few-femtosecond timescale, *revision Physical Review Letters* (2023).

V. Korolev, A. D. Sinelnik, M. V. Rybin, P. Lazarenko, O.M. Kushchenko, V. Glukhenkaya, S. Kozyukhin, **M. Zuerch**, C. Spielmann, T. Pertsch, I. Staude, D. Kartashov. High-order harmonic generation in phase change materials, *revision Nanophotonics* (2023).

## ARTICLES IN PEER-REVIEWED JOURNALS

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1. F. Kohrell, B. Nebgen, J. Spies, R. Hollinger, A. Zong, C. Uzundal, C. Spielmann, **M. Zuerch**. Solid-state high-harmonic generation from cryogenic ZnO using a liquid helium cryostat, *in print Review of Scientific Instruments* (2024).
2. S. F. Kim, H. Schwarz, J. Jurczyk, B. Nebgen, H. Hendricks, H. Park, A. Radosevich, **M. W. Zuerch**<sup>‡</sup>, K. Harper<sup>‡</sup>, M. Lux<sup>‡</sup>, C. Yeung<sup>‡</sup>, R. Sarpong<sup>‡</sup>. Mechanistic Investigation, Wavelength-Dependent Reactivity, and Expanded Reactivity of N-Aryl Azacycle Photomediated Ring Contractions, *in print Journal of the American Chemical Society* (2024).<sup>‡</sup>*corresponding author*.
3. Y. Cheng<sup>†</sup>, A. Zong<sup>†</sup>, L. Wu, Q. Meng, W. Xia, F. Qi, P. Zhu, X. Zou, T. Jiang, Y. Guo, J. van Wezel, A. Kogar, **M. W. Zuerch**<sup>‡</sup>, J. Zhang<sup>‡</sup>, Y. Zhu<sup>‡</sup>, D. Xiang<sup>‡</sup>. Ultrafast formation of topological defects in a 2D charge density wave, *Nature Physics* 20, 54-60 (2024), <https://doi.org/10.1038/s41567-023-02279-x>. <sup>†</sup>*Equal contribution* <sup>‡</sup>*corresponding author*.

4. M. Horio, T. Sumi, J. Bullock, Y. Hirata, M. Miyamoto, B. R. Nebgen, T. Wada, T. Senoo, Y. Tsujikawa, Y. Kubota, S. Owada, K. Tono, M. Yabashi, T. Imori, Y. Miyauchi, **M. W. Zuerch**, I. Matsuda, C. P. Schwartz, W. S. Drisdell. Detecting driving potentials at the buried SiO<sub>2</sub> nanolayers in solar cells by chemical-selective nonlinear X-ray spectroscopy, *Applied Physics Letters* **123**, 031602 (2023).
5. C. Woodahl†, S. Jamnuch†, A. Amado, C. B. Uzundal, E. Berger, P. Manset, Y. Zhu, Y. Li, D. D. Fong, J. G. Connell, Y. Hirata, Y. Kubota, S. Owada, K. Tono, M. Yabashi, S. Tepavcevic, I. Matsuda, W. S. Drisdell, C. P. Schwartz, J. W. Freeland, T. A. Pascal, A. Zong, **M. Zuerch**. Probing Lithium Mobility at a Solid Electrolyte Surface, revision submitted, *Nature Materials* **22**, 848 (2023). †*Equal contribution*.
6. A. Zong, B. Nebgen, S.-C. Lin, J. Spies, **M. Zuerch**. Emerging ultrafast techniques for studying quantum materials, *Nature Reviews Materials* **8**, 224-240 (2023). **Featured Cover Article**.
7. H. N. Gopalakrishna, R. Baruah, C. Hünecke, V. Korolev, M. Thümmel, A. Croy, M. Richter, R. Hollinger, V. Shumakova, I. Uschmann, H. Marschner, **M. Zürich**, C. Reichardt, A. Undisz, J. Dellith, A. Pugdlys, A. Baltužka, C. Spielmann, F. Yahyaei, U. Peschel, S. Gräfe, M. Wächtler, D. Kartashov. Tracing spatial confinement in semiconductor quantum dots by high-order harmonic generation, *Physical Review Research* **5**, 013128 (2023).
8. I. J. Porter, **M. Zuerch**, A. Baranger, and S. R. Leone. Coherent Phonons in Antimony: an Undergraduate Physical Chemistry Solid-State Ultrafast Laser Spectroscopy Experiment, *Journal of Chemical Education* **100**, 342-349 (2023).
9. L. Yue†, R. Hollinger†, C. B. Uzundal, Z. Gan, E. Najafidehghan, A. George, C. Spielmann, D. Kartashov, A. Turchanin, D. Y. Qiu, M. B. Gaarde, and **M. Zuerch**. Signatures of multi-band effects in high-harmonic generation in monolayer MoS<sub>2</sub>, *Physical Review Letters* **129**, 147401 (2022). †*Equal contribution*.
10. L. Hoffmann, S. Jamnuch, C. P. Schwartz, T. Helk, S. L. Raj, H. Mizuno, R. Mincigrucchi, L. Foglia, E. Principi, R. J. Saykally, W. S. Drisdell, S. Fatehi, T. A. Pascal, **M. Zuerch**. Saturable absorption of free-electron laser radiation by graphite near the carbon K-edge, *Journal of Physical Chemistry Letters* **13**, 39, 8963 (2022). **Featured Cover Article. Editor's pick**.
11. Y. Cheng†, A. Zong†, J. Li, W. Xia, S. Duan, W. Zhao, Y. Li, F. Qi, J. Wu, L. Zhao, P. Zhu, X. Zou, T. Jiang, Y. Guo, L. Yang, D. Qian, W. Zhang, A. Kogar, **M. Zuerch**‡, D. Xiang‡, J. Zhang‡. Light-induced dimension crossover dictated by excitonic correlations, *Nature Communication* **13**, 963 (2022). †*Equal contribution* ‡*corresponding author*.
12. G. Zograf, K. Koshelev, A. Zalogina, V. Korolev, D.-Y. Choi, **M. Zürich**, C. Spielmann, B. Luther-Davies, D. Kartashov, S. Makarov, S. Kruk, and Y. Kivshar. High-Harmonic Generation from Resonant Dielectric Metasurfaces Empowered by Bound States in the Continuum, *ACS Photonics* **9**, 567-574, (2022).
13. T. Sumi, M. Horio, T. Senoo, T. Wada, Y. Tsujikawa, X. Zhang, P. Manset, M. Araki, Y. Hirata, W. S. Drisdell, J. W. Freeland, A. Amado, **M. Zuerch**, Y. Kubota, S. Owada, K. Tono, M. Yabashi, C. P. Schwartz, I. Matsuda. Separating Non-linear Optical Signals of a Sample from High Harmonic Radiation in a Soft X-ray Free Electron Laser, *e-Journal of Surface Science and Nanotechnology* **20**, 31-35 (2022).
14. C. B. Uzundal, S. Jamnuch, E. Berger, C. Woodahl, P. Manset, Y. Hirata, T. Sumi, A. Amado, H. Akai, Y. Kubota, S. Owada, K. Tono, M. Yabashi, J. W. Freeland, C. P. Schwartz, W. S. Drisdell, I. Matsuda, T. A. Pascal, A. Zong, and **M. Zuerch**. Polarization-Resolved Extreme Ultraviolet Second Harmonic Generation from LiNbO<sub>3</sub>, *Physical Review Letters* **127**, 237402 (2021).
15. E. Berger, S. Jamnuch, C. B. Uzundal, C. Woodahl, H. Padmanabhan, A. Amado, P. Manset, Y. Hirata, Y. Kubota, S. Owada, K. Tono, M. Yabashi, C. Wang, Y. Shi, V. Gopalan, C. P. Schwartz, W. S. Drisdell, I. Matsuda, J. W. Freeland, T. A. Pascal, and **M. Zuerch**. Extreme Ultraviolet Second Harmonic Generation Spectroscopy in a Polar Metal, *Nano Letters* **21**, 6095-6101 (2021). **Featured Cover Article**.

16. T. Helk<sup>†</sup>, E. Berger<sup>†</sup>, S. Jamnuch<sup>†</sup>, L. Hoffmann, A. Kabacinski, J. Gautier, F. Tissandier, J.-P. Goddet, H.-T. Chang, J. Oh, C. D. Pemmaraju, T. A. Pascal, S. Sebban, C. Spielmann, and **M. Zuerch**. Table-top extreme ultraviolet second harmonic generation, *Science Advances* **7**, eabe2265 (2021). <sup>†</sup>*Equal contribution*. **Featured Cover Article. Featured in Science.**
17. R. Hollinger, E. Haddad, M. Zapf, V. Shumakova, P. Herrmann, R. Röder, I. Uschmann, U. Reislöhner, A. Pugzlys, A. Baltuska, F. Legare, **M. Zürch**, C. Ronning, C. Spielmann, and D. Kartashov. The role of free carrier interaction in strong field excitations in semiconductors, *Physical Review B* **104**, 035203 (2021).
18. J. D. Gaynor, A. P. Fidler, Y.-C. Lin, H.-T. Chang, **M. Zürch**, D. M. Neumark, S. R. Leone. Solid State Core-Exciton Dynamics in NaCl Observed by Tabletop Attosecond Four-Wave Mixing, *Physical Review B* **103**, 245140 (2021).
19. C. P. Schwartz, S. L. Raj, S. Jamnuch, C. J. Hull, P. Miotti, R. K. Lam, D. Nordlund, C. B. Uzundal, C. D. Pemmaraju, R. Mincigrucci, L. Foglia, A. Simoncig, M. Coreno, C. Masciovecchio, L. Giannessi, L. Poletto, E. Principi, **M. Zuerch**, T. A. Pascal, W. S. Drisdell, and R. J. Saykally. Ångström-resolved Interfacial Structure in Organic-Inorganic Junctions, *Physical Review Letters* **127**, 096801 (2021).
20. B. Buades, A. Picon, E. Berger, I. Leon, N. Di Palo, S. L. Cousin, C. Cocchi, E. Pellegrin, J. H. Martin, S. Manas-Valero, E. Coronado, T. Danz, C. Draxl, M. Uemoto, K. Yabana, M. Schultze, S. Wall, **M. Zuerch**, J. Biegert. Attosecond state-resolved carrier motion in quantum materials probed by soft X-ray XANES, *Applied Physics Reviews* **8**, 011408 (2021). **Selected as AIP Highlight.**
21. R. Hollinger, P. Herrmann, V. Korolev, M. Zapf, V. Shumakova, R. Röder, I. Uschmann, A. Pugzlys, A. Baltuska, **M. Zürch**, C. Ronning, C. Spielmann, and D. Kartashov. Polarization Dependent Excitation and High Harmonic Generation from Intense Mid-IR Laser Pulses in ZnO, *Nanomaterials* **11**, 4 (2021).
22. F. Tuitje, P. Martínez Gil, T. Helk, J. Gautier, F. Tissandier, J.-P. Goddet, A. Guggenmos, U. Kleineberg, S. Sebban, E. Oliva, C. Spielmann, and **M. Zürch**. Nonlinear Ionization Dynamics of Hot Dense Plasma Observed in a Laser-Plasma Amplifier, *Nature Light: Science and Applications* **9**, 187 (2020).
23. N. C. Geib, R. Hollinger, E. Haddad, P. Herrmann, F. Légaré, T. Pertsch, C. Spielmann, **M. Zürch**, and F. Eilenberger. Discrete dispersion scan setup for measuring few-cycle laser pulses in the mid-infrared, *Optics Letters* **45**, 5295, (2020).
24. R. Geneaux, C. J. Kaplan, L. Yue, A. D. Ross, J. E. Bækhoj, P. M. Kraus, H.-T. Chang, A. Guggenmos, M.-Y. Huang, **M. Zürch**, K. J. Schafer, D. M. Neumark, M. B. Gaarde, and S. R. Leone. Attosecond time-domain measurement of core-excitonic decay in magnesium oxide, *Physical Review Letters* **124**, 207401 (2020).
25. T. Helk, **M. Zürch**<sup>‡</sup>, C. Spielmann. Towards single shot timeresolved microscopy using short wavelength table-top light sources, *Structural Dynamics* **6**, 010902 (2019). **Selected as featured article.** <sup>‡</sup>*corresponding author.*

#### **Before appointment at UC Berkeley**

26. C. J. Kaplan, P. M. Kraus, E. M. Gullikson, L. J. Borja, S. K. Cushing, **M. Zürch**, H.-T. Chang, D. M. Neumark, S. R. Leone. Retrieval of the complex-valued refractive index of germanium near the M<sub>4,5</sub> absorption edge, *Journal of the Optical Society of America B* **36**, 1716 (2019).
27. G. K. Tadesse, W. Eschen, R. Klas, M. Tschernajew, F. Tuitje, M. Steinert, M. Zilk, V. Schuster, **M. Zürch**, T. Pertsch, C. Spielmann, J. Limpert, J. Rothhardt. Wavelength-scale ptychographic coherent diffractive imaging using a high-order harmonic source, *Scientific Reports* **9**, 1735 (2019).
28. S. K. Cushing, A. Lee, L. M. Carneiro, H.-T. Chang, **M. Zürch**, S. R. Leone. Differentiating Photoexcited Carrier and Phonon Dynamics in the  $\Delta$ , L, and  $\Gamma$  Valleys of Si(100) with Transient Extreme Ultraviolet Spectroscopy, *Journal of Physical Chemistry C* **123** (6), 3343-3352 (2019).

29. S. K. Cushing, **M. Zürich**, P. M. Kraus, L. M. Carneiro, A. Lee, H.-T. Chang, C. J. Kaplan, S. R. Leone. Hot phonon and carrier relaxation in Si(100) determined by transient extreme ultraviolet spectroscopy, *Structural Dynamics* **5**, 054302 (2018).
30. C. J. Kaplan, P. M. Kraus, A. D. Ross, **M. Zürich**, S. K. Cushing, M. F. Jager, H.-T. Chang, E. M. Gullikson, D. M. Neumark, S. R. Leone. Femtosecond Tracking of Carrier Relaxation in Germanium with Extreme Ultraviolet Transient Reflectivity, *Physical Review B* **97**, 205202 (2018).
31. P. M. Kraus, **M. Zürich**, S. K. Cushing, D. M. Neumark, S. R. Leone. The Ultrafast X-ray Spectroscopic Revolution in Chemical Dynamics, *Nature Reviews Chemistry* **2**, 82-94 (2018).
32. R. Sollapur†, D. Kartashov†, **M. Zürich**†, A. Hoffmann, T. Grigorova, G. Sauer, A. Hartung, A. Schwuchow, J. Bierlich, J. Kobelke, M. Chemnitz, Markus A. Schmidt, C. Spielmann. Resonance-enhanced multi-octave supercontinuum generation in antiresonant hollow-core fibers, *Light: Science & Applications*, **6**, e17124 (2017). †Equal contribution.
33. **M. Zürich**, R. Jung, C. Spaeth, J. Tümmler, A. Guggenmos, D. Attwood, U. Kleineberg, H. Stiel and C. Spielmann. Spatial Coherence Limited Coherence Diffraction Imaging using a Molybdenum Soft X-ray Laser Pumped at Moderate Pump Energies, *Nature Scientific Reports* **7**:5314, 1-10 (2017).
34. **M. Zürich**, H.-T. Chang, P. M. Kraus, S. K. Cushing, L. J. Borja, A. Gandman, J. S. Prell, D. Prendergast, C. D. Premmaraju, D. M. Neumark, and S. R. Leone. Carrier Thermalization and Trapping in Silicon-Germanium Alloy Probed by Attosecond XUV Transient Absorption Spectroscopy, *Structural Dynamics* **4** (4), 044029 (2017).
35. **M. Zürich**, H.-T. Chang, L. J. Borja, P. M. Kraus, S. Cushing, A. Gandman, C. J. Kaplan, M. H. Oh, J. S. Prell, D. Prendergast, C. D. Premmaraju, D. M. Neumark, and S. R. Leone. Direct and Simultaneous Observation of Ultrafast Electron and Hole Dynamics in Germanium, *Nature Communications* **8**:15734, 1-11 (2017).
36. H.-T. Chang†, **M. Zürich**†, P. M. Kraus, L. J. Borja, D. M. Neumark, and S. R. Leone. Simultaneous generation of sub-5-femtosecond 400 nm and 800 nm pulses for attosecond extreme ultraviolet pump-probe spectroscopy, *Optics Letters* **41** (22), 5365-5368 (2016). †Equal contribution.
37. G.K. Tadesse, R. Klas, S. Demmler, S. Hädrich, I. Wahyutama, M. Steinert, C. Spielmann, **M. Zürich**, T. Pertsch, A. Tünnermann, J. Limpert and J. Rothhardt. High speed and high resolution table-top nanoscale imaging, *Optics Letters* **41** (22), 5170-5173, also arxiv.org/pdf/1605.02909 (2016).  
**Selected as Editor's pick.**
38. L. J. Borja, **M. Zürich**, C. D. Premmaraju, M. Schultze, K. Ramaseha, A. Gandman, J. S. Prell, D. Prendergast, D. M. Neumark, and S. R. Leone. Extreme Ultraviolet Transient Absorption of Solids from Femtosecond to Attosecond Timescales, *Journal of the Optical Society of America B* **33** (7), C57-C64 (2016).
39. A. Hoffmann, **M. Zürich** and Ch. Spielmann. Extreme nonlinear optics using shaped pulses spectrally broadened in an Ar or SF<sub>6</sub> filled hollow core fiber, *Applied Sciences* **5** (4), 1310-1322 (2015).
40. C. Kern, **M. Zürich**† and C. Spielmann. Limitations of Extreme Nonlinear Ultrafast Nanophotonics, *Nanophotonics* **4** (1), 303-323 (2015). †Corresponding Author.
41. **M. Zürich** and C. Spielmann. Extreme ultraviolet digital in-line holography using a table top source, *Applied Optics* **54** (19), 5992-5997 (2015).
42. **M. Zürich**, J. Rothhardt, S. Hädrich, S. Demmler, M. Krebs, J. Limpert, A. Tünnermann, A. Guggenmos, U. Kleineberg, and C. Spielmann. Real-time and Sub-wavelength Ultrafast Coherent Diffraction Imaging in the Extreme Ultraviolet, *Nature Scientific Reports* **4** (7356), 1-5 (2014).

43. **M. Zürch**, S. Foertsch, M. Matzas, K. Pachmann, R. Kuth, and Ch. Spielmann. Cancer cell classification with coherent diffraction imaging using an extreme ultraviolet radiation source, *Journal of Medical Imaging* **1** (3), 031008 (2014).
44. A. Hoffmann, **M. Zürch**, M. Gräfe, and Ch. Spielmann. Spectral broadening and compression of sub-millijoule laser pulses in hollow-core fibers filled with sulfur hexafluoride, *Optics Express* **22**, 12038-12045 (2014).
45. **M. Zürch**, A. Hoffmann, M. Gräfe, B. Landgraf, M. Riediger, and Ch. Spielmann. Characterization of a broadband interferometric autocorrelator for visible light with ultrashort blue laser pulses, *Optics Communications* **321**, 28-31 (2014).
46. **M. Zürch**, C. Kern, and Ch. Spielmann. XUV coherent diffraction imaging in reflection geometry with low numerical aperture, *Optics Express* **21** (18), 21131-21147 (2013).  
*Full-length feature in Virtual Journal for Biomedical Optics* **8** (10), 2013.
47. **M. Zürch**, C. Kern, P. Hansinger, A. Dreischuh, and Ch. Spielmann. Strong-field physics with singular light beams, *Nature Physics* **8**, 743-746 (2012).
48. S. Eyring, C. Kern, **M. Zürch**, and C. Spielmann. Improving high-order harmonic yield using wavefront-controlled ultrashort laser pulses, *Optics Express* **20** (5), 5601-5606 (2012).
49. C. Kern, **M. Zürch**, J. Petschulat, T. Pertsch, B. Kley, T. Käsebier, U. Hübner, and C. Spielmann. Comparison of femtosecond laser-induced damage on unstructured vs. nano-structured Au-targets, *Applied Physics A* **104** (1), 15-12 (2011).  
**Selected as rapid communication.**

#### ARTICLES IN PEER-REVIEWED PROCEEDINGS

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