

Oliver Gessner, Senior Scientist
Ultrafast X-ray Science Laboratory
Chemical Sciences Division
Lawrence Berkeley National Laboratory
One Cyclotron Road, MS 2-300, Berkeley, California 94720
Phone: (510) 486-6929; Fax: (510) 495-2690; e-mail: ogessner@lbl.gov

Research and Professional Experience

- Senior Scientist, Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, California, since 2011
- Divisional Fellow, Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, California, 2006 – 2011
- Postdoctoral Fellow, Chemistry Department, Queens University, Kingston, Ontario, 2006
- Assistant Research Officer, Atomic, Molecular and Optical Sciences Group, Steacie Institute for Molecular Sciences, National Research Council of Canada, Ottawa, Ontario, 2005 – 2006
- Canadian Government Laboratory Visiting Fellow, Atomic, Molecular and Optical Sciences Group, Steacie Institute for Molecular Sciences, National Research Council of Canada, Ottawa, Ontario, 2002 –2005

Honors

Early Career Research Program Award of the DOE Office of Science – 2012; Steacie Institute for Molecular Sciences Annual Award for Scientific Breakthrough and Technical Innovation – 2005; NSERC Visiting Fellowship in Canadian Government Laboratories – 2002.

Invited Talks (since 2010, selected)

- SPIE Solar Hydrogen and Nanotechnology, San Diego CA (2013).
- 1st Dynamic Structural Science Workshop, DySS Consortium, Abingdon, UK (2013).
- Seminar of the Department of Chemistry, Washington University at St. Louis, MO (2013).
- X-ray Science Division Seminar, Argonne National Laboratory (2013).
- Max-Planck Symposium on Frontiers in X-ray Science, CFEL, Hamburg, Germany (2012).
- 22nd International Conference on the Application of Accelerators in Research and Industry, Fort Worth TX (2012).
- Third Ringberg Workshop on Science with FELs, Ringberg Castle, Rottach, Germany (2012).
- Gordon Conference on Photoions, Photoionization & Photodetachment, Galveston TX (2012).
- Physical Chemistry Seminar, University of California Berkeley (2011).
- New Frontiers in Soft X-ray Scattering and Imaging: COSMIC @ ALS, Berkeley CA (2011).
- Soft X-Ray Science and Instrumentation at the European XFEL, Trieste, Italy (2010).
- Physical Chemistry Seminar, Wayne State University, Detroit MI (2010).
- OSA Frontiers in Optics 2010/Laser Science XXVI, Rochester NY (2010).
- Gordon Conference on Photoions, Photoionization & Photodetachment, Galveston TX (2010).

Other Professional Positions and Activities

- Chair, DAMOP Program Subcommittee on Light Source and Ultrafast Laser Science (2013).
- Co-chair, Physical Chemistry Symposium, 44th Western Regional ACS Meeting, Santa Clara CA (2013).
- Guest editor, Chemical Physics - Special Issue: Attosecond spectroscopy (2013).
- Co-chair, Workshop on time-resolved science at the ALS, Advanced Light Source Users' Meeting, Berkeley CA (2011).

- Co-chair, Focus Session on ultrafast dynamics & imaging and Langmuir Prize Session at APS March Meeting, Dallas TX (2011).
- Chair, “The Future of Ultrafast Soft X-ray Science” workshop, Berkeley CA (2009).
- Reviewer for the Department of Energy (DOE), National Science Foundation (NSF), Deutsche Forschungsgemeinschaft (DFG), Advanced Light Source (ALS), Physical Review Letters, Journal of Chemical Physics, Journal of Physical Chemistry Letters, Journal of Physical Chemistry A, Chemical Physics.

Education

Ph.D. – (Physics), Technische Universität Berlin and Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin, Germany, 2002.

M.S. – (Diplom, Physics), Technische Universität Berlin, Freie Universität Berlin, and Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin, Germany, 1996.

B.S. – (Vordiplom, Physics), Technische Universität Berlin, Germany, 1991.

Graduate and Postdoctoral Advisors:

Prof. Uwe Becker, Graduate Advisor, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin, Germany.

Prof. Albert Stolow, Postdoctoral Advisor, Steacie Institute for Molecular Sciences, Ottawa.

Publications

1. Andrey Shavorskiy, Amy Cordones, Josh Vura-Weis, Katrin Siefertmann, Daniel Slaughter, Felix Sturm, Fabian Weise, Matthew Strader, Hana Cho, Ming-Fu Lin, Camila Bacellar, Champak Khurmi, Marcus Hertlein, Jinghua Guo, Hendrik Bluhm, Tolek Tyliczszak, David Prendergast, Giacomo Coslovich, Joseph Robinson, Robert A. Kaindl, Robert W. Schoenlein, Ali Belkacem, Thorsten Weber, Daniel M. Neumark, Stephen R. Leone, Dennis Nordlund, Hirohito Ogasawara, Anders R. Nilsson, Oleg Krupin, Joshua J. Turner, William F. Schlotter, Michael R. Holmes, Philip A. Heimann, Marc Messerschmidt, Michael P. Minitti, Martin Beye, Sheraz Gul, Jin Z. Zhang, Nils Huse, and Oliver Gessner, “Time-Resolved X-Ray Photoelectron Spectroscopy Techniques for Real-Time Studies of Interfacial Charge Transfer Dynamics”, Application of Accelerators in Research and Industry, AIP Conf. Proc. **1525**, 475 (2013), http://proceedings.aip.org/resource/2/apcpcs/1525/1/475_1.
2. Olga Smirnova and Oliver Gessner, “Attosecond Spectroscopy”, Chem. Phys. **414**, 1 (2013), <http://www.sciencedirect.com/science/article/pii/S0301010412004740>.
3. Ming-Fu Lin, Adrian N. Pfeiffer, Daniel M. Neumark, Stephen R. Leone, and Oliver Gessner, “Strong-field induced XUV transmission and multiplet splitting in $4d^{-1}6p$ core-excited Xe studied by femtosecond XUV transient absorption spectroscopy”, J. Chem. Phys. **137**, 244305 (2012), http://jcp.aip.org/resource/1/jcpsa6/v137/i24/p244305_s1.
4. Oliver Bünermann, Oleg Kornilov, Daniel J. Haxton, Stephen R. Leone, Daniel M. Neumark, and Oliver Gessner, “Ultrafast Probing of Ejection Dynamics of Rydberg Atoms and Molecular Fragments from Electronically Excited Helium Nanodroplets”, J. Chem. Phys. **137**, 214302 (2012), http://jcp.aip.org/resource/1/jcpsa6/v137/i21/p214302_s1.
5. Fabian Weise, Daniel M. Neumark, Stephen R. Leone, and Oliver Gessner, “Differential near-edge coherent diffractive imaging using a femtosecond high-harmonic XUV light source”, Opt. Express **20**, 26167 (2012), <http://www.opticsexpress.org/abstract.cfm?URI=oe-20-24-26167>.
6. J. P. Cryan, J. M. Glowonia, J. Andreasson, A. Belkacem, N. Berrah, C. I. Blaga, C. Bostedt, J. Bozek, N. A. Cherepkov, L. F. DiMauro, L. Fang, O. Gessner, M. Gühr, J. Hajdu, M. P. Hertlein, M. Hoener, O. Kornilov, J. P. Marangos, A. M. March, B. K. McFarland, H. Merdji, M. Messerschmidt, V. Petrovic, C. Raman, D. Ray, D. Reis, S. K. Semenov, M. Trigo, J. White, W. White, L. Young, P. H. Bucksbaum, and R. N. Coffee, “Molecular Frame Auger

- Electron Energy Spectrum from N₂”, *J. Phys. B: At. Mol. Opt. Phys.* **45**, 055601 (2012), <http://iopscience.iop.org/0953-4075/45/5/055601/>.
7. Oliver Bünermann, Oleg Kornilov, Stephen R. Leone, Daniel M. Neumark, and Oliver Gessner, “Femtosecond Extreme Ultraviolet Ion Imaging of Ultrafast Dynamics in Electronically Excited Helium Nanodroplets”, *IEEE J. Sel. Top. Quantum Electron.* **18**, 308 (2012), <http://dx.doi.org/10.1109/JSTQE.2011.2109054>.
 8. Oleg Kornilov, Oliver Bünermann, Daniel J. Haxton, Stephen R. Leone, Daniel M. Neumark, and Oliver Gessner, “Femtosecond photoelectron imaging of transient electronic states and Rydberg atom emission from electronically excited He droplets”, *J. Phys. Chem. A* **115**, 7891 (2011), <http://pubs.acs.org/doi/full/10.1021/jp2004216>.
 9. O. Gessner, O. Kornilov, M. Hoener, L. Fang, and N. Berrah, “Intense Femtosecond X-ray Photoionization Studies of Nitrogen - How Molecules interact with Light from the LCLS” *in* *Ultrafast Phenomena XVII*, M. Chergui, D. M. Jonas, E. Riedle, R. W. Schoenlein, A. J. Taylor, Eds., Oxford University Press (2011).
 10. L. Fang, M. Hoener, O. Gessner, F. Tarantelli, S.T. Pratt, O. Kornilov, C. Buth, M. Gühr, E.P. Kanter, C. Bostedt, J.D. Bozek, P.H. Bucksbaum, M. Chen, R. Coffee, J. Cryan, M. Glowonia, E. Kukk, S.R. Leone, and N. Berrah, “Double core hole production in N₂: Beating the Auger clock”, *Phys. Rev. Lett.* **105**, 083005 (2010), <http://prl.aps.org/abstract/PRL/v105/i8/e083005>.
 11. James P. Cryan, J. M. Glowonia, J. Andreasson, A. Belkacem, N. Berrah, C. I. Blaga, C. Bostedt, J. Bozek, C. Buth, L. F. DiMauro, L. Fang, O. Gessner, M. Guehr, J. Hajdu, M. P. Hertlein, M. Hoener, O. Kornilov, J. P. Marangos, A. M. March, B. K. McFarland, H. Merdji, V. Petrovic, C. Raman, D. Ray, D. Reis, F. Tarantelli, M. Trigo, J. White, W. White, L. Young, P. H. Bucksbaum, and R. N. Coffee, “Auger electron angular distribution of double core hole states in the molecular reference frame”, *Phys. Rev. Lett.* **105**, 083004 (2010), <http://prl.aps.org/abstract/PRL/v105/i8/e083004>.
 12. James M. Glowonia, J. Cryan, J. Andreasson, A. Belkacem, N. Berrah, C. I. Blaga, C. Bostedt, J. Bozek, L. F. DiMauro, L. Fang, J. Frisch, O. Gessner, M. Gühr, J. Hajdu, M. P. Hertlein, M. Hoener, G. Huang, O. Kornilov, J. P. Marangos, A. M. March, B. K. McFarland, H. Merdji, V. S. Petrovic, C. Raman, D. Ray, D. A. Reis, M. Trigo, J. L. White, W. White, R. Wilcox, L. Young, R. N. Coffee, and P. H. Bucksbaum, “Time-resolved pump-probe experiments at the LCLS”, *Opt. Express* **18**, 17620 (2010), <http://www.opticsinfobase.org/oe/abstract.cfm?URI=oe-18-17-17620>.
 13. M. Hoener, L. Fang, O. Kornilov, O. Gessner, S.T. Pratt, M. Gühr, E.P. Kanter, C. Blaga, C. Bostedt, J.D. Bozek, P.H. Bucksbaum, C. Buth, M. Chen, R. Coffee, J. Cryan, L. DiMauro, M. Glowonia, E. Hosler, E. Kukk, S.R. Leone, B. McFarland, M. Messerschmidt, B. Murphy, V. Petrovic, D. Rolles, and N. Berrah, “Ultra-intense X-ray Induced Ionization, Dissociation, and Frustrated Absorption in Molecular Nitrogen”, *Phys. Rev. Lett.* **104**, 253002 (2010), <http://prl.aps.org/abstract/PRL/v104/i25/e253002>.
 14. Oleg Kornilov, Russel Wilcox, and Oliver Gessner, “Nanograting-based compact vacuum ultraviolet spectrometer and beam profiler for in situ characterization of high-order harmonic generation light sources”, *Rev. Sci. Instrum.* **81**, 063109 (2010), <http://link.aip.org/link/doi/10.1063/1.3443575>.
 15. Oleg Kornilov, Chia C. Wang, Oliver Bünermann, Andrew T. Healy, Mathew Leonard, Chunte Peng, Stephen R. Leone, Daniel M. Neumark, and Oliver Gessner, “Ultrafast dynamics in Helium nanodroplets probed by femtosecond time-resolved EUV photoelectron imaging”, *J. Phys. Chem. A* **114**, 1437 (2010), <http://pubs.acs.org/doi/abs/10.1021/jp907312t>.
 16. Christer Z. Bisgaard, Owen J. Clarkin, Guorong Wu, Anthony M. D. Lee, Oliver Geßner, Carl C. Hayden, Albert Stolow, “Time-Resolved Molecular Frame Dynamics of Fixed-in-Space CS₂ Molecules”, *Science* **323**, 1464 (2009), <http://www.sciencemag.org/cgi/content/abstract/323/5920/1464>.

17. Chia C. Wang, Oleg Kornilov, Oliver Gessner, Jeong Hyun Kim, Darcy S. Peterka and Daniel M. Neumark, "Photoelectron Imaging of Helium Droplets Doped with Xe and Kr Atoms", *J. Phys. Chem. A* **112**, 9356 (2008), <http://dx.doi.org/10.1021/jp802332f>.
18. Björn Zimmermann, Daniel Rolles, Burkhard Langer, Rainer Hentges, Markus Braune, Slobodan Cvejanović, Oliver Geßner, Franz Heiser, Sanja Korica, Toralf Lischke, Axel Reinköster, Jens Viehhaus, Reinhard Dörner, Vincent McKoy and Uwe Becker, "Localization and loss of coherence in molecular double-slit experiments", *Nature Phys.* **4**, 649 (2008); published online 15 June 2008 (10.1038/nphys993), <http://dx.doi.org/10.1038/nphys993>.
19. O. Geßner, A.M.D. Lee, E.t-H. Chrysostom, C.C. Hayden and A. Stolow, "Femtosecond Multidimensional Imaging - Watching Chemistry from the Molecule's Point of View", *in* *Ultrafast Phenomena XV*, P. Corkum, D. Jonas, R. J. D. Miller, A. M. Weiner, Eds., Springer-Verlag, Berlin (2007), http://dx.doi.org/10.1007/978-3-540-68781-8_118.
20. S. Levchenko, H. Reisler, A. Krylov, O. Gessner, A. Stolow, H. Shi, A.L.L. East, Photodissociation dynamics of the NO dimer: 1. Theoretical overview of the ultraviolet singlet excited states, *J. Chem. Phys.* **125**, 84301 (2006), <http://link.aip.org/link/JCPSA6/v125/i8/p084301/s1&Agg=doi>.
21. D. Rolles, M. Braune, S. Cvejanović, O. Geßner, R. Hentges, S. Korica, B. Langer, T. Lischke, G. Prümper, A. Reinköster, J. Viehhaus, B. Zimmermann, V. McKoy, U. Becker, "Probing the transition from non-localization to localization by K-shell photoemission from isotope-substituted N₂", *Radiat. Phys. Chem.* **75**, 1514 (2006), <http://www.sciencedirect.com/science/article/B6TVT-4KCHD2F-2/2/6e0773dade754575510539420e586660>.
22. O. Geßner, A.M.D. Lee, J.P. Shaffer, H. Reisler, S. Levchenko, A. Krylov, Jonathan G. Underwood, H. Shi, A.L.L. East, D.M. Wardlaw, E.t-H. Chrysostom, C.C. Hayden and Albert Stolow, "Femtosecond Multidimensional Imaging of a Molecular Dissociation", *Science* **311**, 219 (2006); published online 15 December 2005 (10.1126/science.1120779), <http://www.sciencemag.org/cgi/content/abstract/311/5758/219>.
23. D. Rolles, M. Braune, S. Cvejanović, O. Geßner, R. Hentges, S. Korica, B. Langer, T. Lischke, G. Prümper, A. Reinköster, J. Viehhaus, B. Zimmermann, V. McKoy and U. Becker, "Isotope-induced partial localization of core electrons in the homonuclear molecule N₂", *Nature* **437**, 711 (2005), <http://dx.doi.org/10.1038/nature04040>.
24. O. Geßner, E.t-H. Chrysostom, A.M.D. Lee, J.P. Shaffer, C.C. Hayden and A. Stolow, "Photodissociation dynamics studied via Time-Resolved Coincidence Imaging Spectroscopy" *in* *Ultrafast Phenomena XIV*, T. Kobayshi, T. Okada, T. Kobayashi, K. A. Nelson, S. De Silvestri Eds., Springer-Verlag, Berlin (2005), http://dx.doi.org/10.1007/3-540-27213-5_151.
25. G. Prümper, J. Viehhaus, S. Cvejanović, D. Rolles, T. Lischke, R. Hentges, C. Wienberg, U. Becker, B. Langer, O. Geßner, T. Prosperi, N. Zema, S. Turchini, W. Mahler, B. Zada, F. Senf, "Upper Limits for stereo-selective photo dissociation of free Amino Acids in the VUV and at the C1s-Edge", *Phys. Rev. A* **69**, 62717 (2004), <http://link.aps.org/abstract/PRA/v69/e062717>.
26. O. Geßner, E.t.-H. Chrysostom, A.M. Lee, D.M. Wardlaw, M.-L. Ho, S.-J. Lee, B.-M. Cheng, M.Z. Zgierski, I.-C. Chen, J.P. Shaffer, C.C. Hayden and A. Stolow, "Non-adiabatic intramolecular and photodissociation dynamics studied by femtosecond time-resolved photoelectron and coincidence imaging spectroscopy", *Faraday Discuss.* **127**, 193 (2004), <http://dx.doi.org/10.1039/b316742a>.
27. O. Geßner, "Untersuchung der Photoionisationsdynamik räumlich orientierter Moleküle in der Gasphase" *in* *Studies of Vacuum Ultraviolet and X-ray Processes*, Vol. 15, U. Becker Ed., Wissenschaft und Technik Verlag, Berlin (2002).
28. O. Geßner, Y. Hikosaka, B. Zimmermann, A. Hempelmann, R.R. Lucchese, J.H.D. Eland, P.-M. Guyon, and U. Becker, "4σ-1 Inner Valence Photoionization Dynamics of NO Derived

- from Photoelectron-Photoion Angular Correlations”, *Phys. Rev. Lett.* **88**, 193002 (2002), <http://link.aps.org/abstract/PRL/v88/e193002>.
29. G. Prümper, O. Geßner, B. Zimmermann, J. Viefhaus, R. Hentges, H. Kleinpoppen, and U. Becker, “Absorption of circularly polarized VUV radiation in polarized iron vapour”, *J. Phys. B: At. Mol. Opt. Phys.* **34**, 2707 (2001), <http://iopscience.iop.org/0953-4075/34/13/312>.
 30. U. Becker, O. Geßner, A. Rüdell, “Photoelectron scattering in molecules and fullerenes”, *J. Electron Spectroscop. Relat. Phenom.* **108**, 189 (2000), <http://www.sciencedirect.com/science/article/B6TGC-40T9H2X-P/2/75bffdd475387fbf7b9fd5861e37b948>
 31. O. Gessner, F. Heiser, N.A. Cherepkov, B. Zimmermann, U. Becker, “Photoelectron scattering effects in molecular photoionization”, *J. Electron Spectroscop. Relat. Phenom.* **101-103**, 113 (1999), <http://www.sciencedirect.com/science/article/B6TGC-3XHH1CT-N/2/73eeb10003818ee9ac9e27e6bd6775d1>.
 32. A. Hempelmann, M. N. Piancastelli, F. Heiser, O. Gessner, A. Rüdell, and U. Becker, “Resonant photofragmentation of methanol at the carbon and oxygen K-edge by high-resolution ion-yield spectroscopy”, *J. Phys. B: At. Mol. Opt. Phys.* **32**, 2677 (1999), <http://www.iop.org/EJ/abstract/0953-4075/32/11/315/>.
 33. M. N. Piancastelli, A. Hempelmann, F. Heiser, O. Geßner, A. Rüdell, and U. Becker, “Resonant photofragmentation of water at the oxygen K edge by high-resolution ion-yield spectroscopy”, *Phys. Rev. A* **59**, 300 (1999), <http://link.aps.org/abstract/PRA/v59/p300>.
 34. J. Viefhaus, G. Snell, R. Hentges, M. Wiedenhöft, F. Heiser, O. Geßner, and U. Becker, “Interference Effects between Auger and Photoelectron Studied by Subnatural Linewidth Auger-Photoelectron Coincidence Spectroscopy”, *Phys. Rev. Lett.* **80**, 1618 (1998), <http://link.aps.org/doi/10.1103/PhysRevLett.80.1618>.
 35. A. V. Golovin, F. Heiser, C.J.K. Quayle, P. Morin, M. Simon, O. Geßner, P.-M. Guyon, and U. Becker, “Observation of Site-Specific Electron Emission in the Decay of Superexcited O₂”, *Phys. Rev. Lett.* **79**, 4554 (1997), <http://link.aps.org/abstract/PRL/v79/p4554>.
 36. F. Heiser, O. Geßner, J. Viefhaus, K. Wieliczek, R. Hentges, and U. Becker, “Demonstration of Strong Forward-Backward Asymmetry in the C1s Photoelectron Angular Distribution from Oriented CO Molecules”, *Phys. Rev. Lett.* **79**, 2435 (1997), <http://link.aps.org/doi/10.1103/PhysRevLett.79.2435>.
 37. F. Heiser, O. Geßner, U. Hergenbahn, J. Viefhaus, K. Wieliczek, N. Saito, and U. Becker, “Photoelectron spectroscopy on oriented molecules”, *J. Electron Spectrosc. Relat. Phenom.* **79**, 415 (1996), <http://www.sciencedirect.com/science/article/B6TGC-3THGKFF-57/2/bdbe6d87f912e4bc7feca3c719e46261>.
 38. J. Viefhaus, L. Avaldi, F. Heiser, R. Hentges, O. Gessner, A. Rüdell, M. Wiedenhöft, K. Wieliczek and U. Becker, “Energy and angle resolved studies of double photo-ionization of helium by electron time-of-flight coincidence spectroscopy”, *J. Phys. B: At. Mol. Opt. Phys.* **29**, L729 (1996), <http://www.iop.org/EJ/abstract/0953-4075/29/20/002/>.

Patents

"Devices useful for vacuum ultraviolet beam characterization", by Oliver Gessner, Oleg A Kornilov, Russell B Wilcox (Berkeley Lab case number IB-2520-PCT). PCT Patent Application Serial Number PCT/US2009/031899, filed 1/23/2009.