Oliver Gessner, Senior Scientist
Chemical Sciences Division
Lawrence Berkeley National Laboratory
One Cyclotron Road, MS 2-300, Berkeley, California 94720
Phone: (510) 486-6929; Fax: (510) 486-7043; e-mail: ogessner@lbl.gov

Positions Held

- Leader of the Atomic, Molecular and Optical Sciences (AMOS) Program, Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, California, since 2019
- 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, Queen's 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

- Fellow of the American Physical Society – 2015
- LBNL Director's Award for Exceptional Scientific Achievement – 2014
- 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 & Lectures (since 2017, selected)

- 241st Electrochemical Society (ECS) Meeting, Vancouver BC, Canada (2022).
- ACS Spring 2022 National Meeting, San Diego CA (2022).
- ALS Tender Scattering Science Workshop, Advanced Light Source (2021).
- Colloquium of the Center for Nanoscale Materials, Argonne National Laboratory (2021).
- Physics Colloquium, Innsbruck University (2021).
- Future Positioning of BESSY III – Chemical kinetics with high throughput Workshop (2020).
- PRiME Meeting of The Electrochemical Society (ECS) (2020).
- Chemistry & Chemical Biology Colloquium at the University of California, Merced CA (2020).
- Physical Chemistry/Chemical Physics Colloquium at the University of Colorado, Boulder CO (2020).
- Applications of X-ray Lasers to Gas Phase Chemical Physics Research Workshop, SLAC, Menlo Park CA (2020).
- Gordon Research Conference on Molecular and Ionic Clusters, Ventura CA (2020).
- 236th Electrochemical Society (ECS) Meeting, Atlanta GA (2019).
- Beating the Complexity of Matter through the Selectivity of X-rays - Dynamic Pathways in Multidimensional Landscapes (SXR 2019), Berlin, Germany (2019).
- Conference on Quantum Fluid Clusters (QFC), Bad Honnef, Germany (2019).
- New Scientific Capabilities at European XFEL Workshop, Hamburg, Germany (2019)
- Photon Tools for Physical Chemistry (PTPC), Beatenberg, Switzerland (2019).

- 14th International Conference on Electronic Structure and Spectroscopy (ICESS), Shanghai, China (2018).
- Gordon Research Conference on Multiphoton Processes, Smithfield RI (2018).
- ASU Compact X-ray Free Electron Laser Workshop, Tempe AZ (2018).
- Hamburg Photon Science Colloquium, Hamburg, Germany (2018).
- OSA Frontiers in Optics & Laser Science, Washington DC (2017).
- Conference on Quantum Fluid Clusters (QFC), Obergurgl, Austria (2017).

Other Professional Activities

- Editorial Board, Journal of Physics B: Atomic, Molecular and Optical Physics (2019-).
- LCLS-II AMO Instrument Advisory Panel (2016-).
- Panel lead, Liquid Phase and Interfacial Chemical Dynamics, National Extreme Ultrafast Science Facility (NeXUS) User Workshop (2022).
- Committee member, American Physical Society DAMOP Jin Award for Outstanding Doctoral Thesis Research (2018-2019).
- Panel lead, Department of Energy Roundtable on XFEL Ultrafast Science (2017).
- Chair, DAMOP Program Subcommittee on Light Source and Ultrafast Laser Science (2014-2016).
- Co-chair, Soft X-ray in Energy and Time (SXET) Workshop, Berlin (2015).
- 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), European Research Council (ERC), Deutsche Forschungsgemeinschaft (DFG), Helmholtz Association of German Research Centers, Swiss National Science Foundation (SNSF), Advanced Light Source (ALS), Stanford Synchrotron Radiation Lightsource (SSRL), Science, Phys. Rev. Lett., Phys. Rev. A, Nat. Phys., J. Chem. Phys., J. Phys. Chem. Lett., J. Phys. Chem. A, PCCP, Chem. Phys., J. Phys. B, Struct. Dyn., Chem. Phys. Chem., Sci. Rep., J. Med. Imaging, New J. Phys., Rev. Sci. Instrum.

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. Friedrich Roth, Johannes Mahl, Mario Borgwardt, Lukas Wenthaus, Felix Brausse, Valentin Garbe, Oliver Gessner, and Wolfgang Eberhardt, "Dynamical non-linear inversion of the surface photovoltage on Si (100)", *submitted* (2022).
2. C. Bacellar, A. S. Chatterley, F. Lackner, C. D. Pemmaraju, R. M. P. Tanyag, D. Verma, C. Bernando, S. O'Connell, M. Bucher, K. R. Ferguson, T. Gorkhover, R. Coffee, G. Coslovich, D. Ray, T. Osipov, D. M. Neumark, C. Bostedt, A. F. Vilesov, and O. Gessner, "Anisotropic surface broadening and core depletion during the evolution of a strong-field induced nanoplasma", Phys. Rev. Lett. **129**, 073201 (2022), DOI: 10.1103/PhysRevLett.129.073201.
3. Alexandra J. Feinberg, Felix Laimer, Rico Mayro Tanyag, Björn Senfftleben, Yevheniy Ovcharenko, Simon Dold, Michael Gatchell, Sean M.O. O'Connell, Swetha Erukala, Catherine A. Saladrigas, Benjamin W. Toulson, Andreas Hoffman, Ben Kamerin, Rebecca Boll, Alberto DeFanis, Patrik Grychtol, Tommaso Mazza, Jacobo Montano, Kiana Setoodehnia, David Lomidze, Robert Hartmann, Philipp Schmidt, Anatoli Ulmer, Alessandro Colombo, Michael Meyer, Thomas Moeller, Daniela Rupp, Oliver Gessner, Paul Scheier, Andrey F Vilesov, "X-Ray Diffractive Imaging of Highly Ionized Helium Nanodroplets", Phys. Rev. Res. **4**, L022063 (2022), DOI: 10.1103/PhysRevResearch.4.L022063.
4. Rico Mayro Tanyag, Camila Bacellar, Weiwu Pang, Charles Bernando, Luis Gomez, Curtis Jones, Ken Ferguson, Justin Kwok, Denis Anielski, Ali Belkacem, Rebecca Boll, John Bozek, Sebastian Carron, Gang Chen, Tjark Delmas, Lars Englert, Sascha Epp, Benjamin Erk, Lutz Foucar, Robert Hartmann, Alexander Hexemer, Martin Huth, Stephen Leone, Jonathan Ma, Stefano Marchesini, Daniel Neumark, Billy Poon, James Prell, Daniel Rolles, Benedikt Rudek, Artem Rudenko, Martin Seifrid, Michele Swiggers, Joachim Ullrich, Fabian Weise, Petrus Zwart, Christoph Bostedt, Oliver Gessner, and Andrey Vilesov, "Sizes of pure and doped helium droplets from single shot x-ray imaging", J. Chem. Phys. **156**, 041102 (2022), DOI: 10.1063/5.0080342.
5. Alexandra J. Feinberg, Deepak Verma, Sean M.O. O'Connell, Swetha Erukala, Rico M.P. Tanyag, Weiwu Pang, Catherine A. Saladrigas, Benjamin W. Toulson, Mario Borgwardt, Niranjan Shivaram, Ming-Fu Lin, Andre Al Haddad, Wolfgang Jäger, Christoph Bostedt, Peter Walter, Oliver Gessner and Andrey F. Vilesov, "Aggregation of solutes in bosonic versus fermionic quantum fluids", Sci. Adv. **7**, eabk2247 (2021), DOI: 10.1126/sciadv.abk2247.
6. Stefan Neppl, Johannes Mahl, Friedrich Roth, Giuseppe Mercurio, Guosong Zeng, Francesca M. Toma, Nils Huse, Peter Feulner, and Oliver Gessner, "Nanoscale confinement of photo-injected electrons at hybrid interfaces", J. Phys. Chem. Lett. **12**, 11951 (2021), DOI: 10.1021/acs.jpclett.1c02648.
7. Johannes Mahl, Oliver Gessner, Johannes V. Barth, Peter Feulner and Stefan Neppl, "Strong potential gradients and electron confinement in nanoscale ZnO", ACS Appl. Nano Mater. **4**, 12213 (2021), DOI: 10.1021/acsanm.1c02730.
8. Davide Faccialà, Benjamin W. Toulson, and Oliver Gessner, "Removal of correlated background in high-order harmonic transient absorption spectra with principal component regression", Opt. Express **29**, 35135 (2021), DOI: 10.1364/OE.435008.
9. Catherine A. Saladrigas, Alexandra J. Feinberg, Michael P. Ziemkiewicz, Camila Bacellar, Maximilian Bucher, Charles Bernando, Sebastian Carron, Adam S. Chatterley, Franz-Josef Decker, Ken R. Ferguson, Luis Gomez, Taisia Gorkhover, Nathan A. Helvy, Curtis F. Jones, Justin J. Kwok, Alberto Lutman, Daniela Rupp, Rico Mayro P. Tanyag, Thomas Möller, Daniel M. Neumark, Christoph Bostedt, Andrey F. Vilesov, and Oliver Gessner, "Charging and Ion Ejection Dynamics of Large Helium Nanodroplets Exposed to Intense Femtosecond Soft X-Ray Pulses", Eur. Phys. J. Spec. Top. **230**, 4011 (2021), DOI: 10.1140/epjs/s11734-021-00280-0.

10. Felix Brausse, Mario Borgwardt, Johannes Mahl, Matthew Fraund, Friedrich Roth, Monika Blum, Wolfgang Eberhardt, and Oliver Gessner, “Real-time Interfacial Electron Dynamics Revealed through Temporal Correlations in X-ray Photoelectron Spectroscopy”, Struct. Dyn. **8**, 044301 (2021), DOI: 10.1063/4.0000099.
11. Friedrich Roth, Mario Borgwardt, Lukas Wenthaus, Johannes Mahl, Steffen Palutke, Günter Brenner, Serguei Molodtsov, Wilfried Wurth, Oliver Gessner, and Wolfgang Eberhardt, “Direct observation of charge separation in an organic light harvesting system by femtosecond time-resolved XPS”, Nat. Commun. **12**, 1196 (2021), DOI: 10.1038/s41467-021-21454-3.
12. Benjamin W. Toulson, Mario Borgwardt, Davide Faccialà, Daniel M. Neumark, Stephen R. Leone, and Oliver Gessner, “Probing Delayed C–I Bond Fission in the UV Photochemistry of 2-Iodothiophene with Core-to-Valence Transient Absorption Spectroscopy”, *in* Proceedings, International Conference on Ultrafast Phenomena (2020), DOI: 10.1364/UP.2020.Th3A.5.
13. Florian Lackner, Julia A. Gessner, Florian Siegrist, Alexander Schiffmann, Roman Messner, Maximilian Lasserus, Martin Schnedlitz, Benjamin W. Toulson, Daniel Knez, Ferdinand Hofer, Oliver Gessner, Wolfgang E. Ernst, Martin Schultze, “Attosecond Spectroscopy of Ultrafast Carrier Dynamics in Nanoparticles”, *in* Proceedings, International Conference on Ultrafast Phenomena (2020), DOI: 10.1364/UP.2020.M4A.13.
14. Matthew Fraund, Mario Borgwardt, Johannes Mahl, Felix Brausse, Friedrich Roth, Monika Blum, Oliver Gessner, “Towards Real-Time Monitoring of Interfacial Chemical Dynamics with Time-Resolved X-ray Photoelectron Spectroscopy”, *in* Proceedings, International Conference on Ultrafast Phenomena (2020), DOI: 10.1364/UP.2020.Tu4A.20.
15. Deepak Verma, Sean M. O. O’Connell, Alexandra J. Feinberg, Swetha Erukala, Rico M. Tanyag, Charles Bernando, Weiwu Pang, Catherine Saladrigas, Benjamin Toulson, Mario Borgwardt, Niranjan Shivaram, Ming-Fu Lin, Andre Al Haddad, Wolfgang Jäger, Christoph Bostedt, Peter Walter, Oliver Gessner, and Andrey F. Vilesov, “Shapes of rotating normal fluid ^{3}He versus superfluid ^{4}He droplets in molecular beams”, Phys. Rev. B **102**, 014504 (2020), DOI: 10.1103/PhysRevB.102.014504.
16. Mario Borgwardt, Johannes Mahl, Friedrich Roth, Lukas Wenthaus, Felix Brauße, Monika Blum, Klaus Schwarzburg, Guiji Liu, Francesca M. Toma, and Oliver Gessner, “Photoinduced charge carrier dynamics and electron injection efficiencies in Au nanoparticle-sensitized TiO_2 determined with picosecond time-resolved X-ray photoelectron spectroscopy”, J. Phys. Chem. Lett. **11**, 5476 (2020), DOI: 10.1021/acs.jpclett.0c00825.
17. Sean M. O. O’Connell, Rico Mayro P. Tanyag, Deepak Verma, Charles Bernando, Weiwu Pang, Camila Bacellar, Catherine A. Saladrigas, Johannes Mahl, Benjamin W. Toulson, Yoshiaki Kumagai, Peter Walter, Francesco Ancilotto, Manuel Barranco, Marti Pi, Christoph Bostedt, Oliver Gessner and Andrey F. Vilesov, “Angular momentum in rotating superfluid droplets”, Phys. Rev. Lett. **124**, 215301 (2020), DOI: 10.1103/PhysRevLett.124.215301.
18. Alexander Schiffmann, Benjamin W. Toulson, Daniel Knez, Roman Messner, Martin Schnedlitz, Maximilian Lasserus, Ferdinand Hofer, Wolfgang E. Ernst, Oliver Gessner, and Florian Lackner, “Ultrashort XUV Pulse Absorption Spectroscopy of Partially Oxidized Cobalt Nanoparticles”, J. Appl. Phys. **127**, 184303 (2020), DOI: 10.1063/5.0004582.
19. M. Mudrich, A. C. LaForge, A. Ciavardini, P. O'Keeffe, C. Callegari, M. Coreno, A. Demidovich, M. Devetta, M. Di Fraia, M. Drabbels, P. Finetti, O. Gessner, C. Grazioli, A. Hernando, D. M. Neumark, Y. Ovcharenko, P. Piseri, O. Plekan, K. C. Prince, R. Richter, M. P. Ziemkiewicz, T. Möller, J. Eloranta, M. Pi, M. Barranco, F. Stienkemeier, “Ultrafast relaxation of photoexcited superfluid He nanodroplets”, Nat. Commun. **11**, 112 (2020), DOI: 10.1038/s41467-019-13681-6.
20. Benjamin W. Toulson, Mario Borgwardt, Han Wang, Florian Lackner, Adam S. Chatterley, C. D. Pemmaraju, Daniel M. Neumark, Stephen R. Leone, David Prendergast and Oliver Gessner, “Probing Ultrafast C–Br Bond Fission in the UV Photochemistry of Bromoform

with Core-to-Valence Transient Absorption Spectroscopy", Struct. Dyn. **6**, 054304 (2019), DOI: 10.1063/1.5113798.
21. O. Gessner and A. Vilesov, "Imaging Quantum Vortices in Superfluid Helium Droplets", Annu. Rev. Phys. Chem., **70**, 173 (2019), DOI: 10.1146/annurev-physchem-042018-052744.
22. J. Mahl, S. Neppl, F. Roth, M. Borgwardt, C. Saladrigas, B. W. Toulson, J. Kyle Cooper, T. Rahman, H. Bluhm, J. Guo, W. Yang, N. Huse, W. Eberhardt, and O. Gessner, "Decomposing Electronic and Lattice Contributions in Optical Pump – X-ray Probe Transient Inner-Shell Absorption Spectroscopy of CuO", Faraday Discuss. **216**, 414 (2019), DOI: 10.1039/C8FD00236C.
23. K. Schnorr, A. Bhattacherjee, K.J. Oosterbaan, M.G. Delcey, Z. Yang, T. Xue, A.R. Attar, A.S. Chatterley, M. Head-Gordon, S.R. Leone, and O. Gessner, "Tracing the 267 nm-Induced Radical Formation in Dimethyl Disulfide Using Time-Resolved X-ray Absorption Spectroscopy", J. Phys. Chem. Lett. **10**, 1382 (2019), DOI: 10.1021/acs.jpclett.9b00159.
24. F. Roth, S. Neppl, A. Shavorskiy, T. Arion, J. Mahl, H. O. Seo, H. Bluhm, Z. Hussain, O. Gessner, and W. Eberhardt, "Efficient charge generation from triplet excitons in metal-organic heterojunctions", Phys. Rev. B **99**, 020303(R) (2019), DOI: 10.1103/PhysRevB.99.020303.
25. C. Bacellar, A. S. Chatterley, F. Lackner, C. D. Pemmaraju, R. M. P. Tanyag, C. Bernando, D. Verma, S. O'Connell, M. Bucher, K. R. Ferguson, T. Gorkhover, N. C. Ryan, G. Coslovich, D. Ray, T. Osipov, D. M. Neumark, C. Bostedt, A. F. Vilesov, and O. Gessner, "Evaporation of an Anisotropic Nanoplasma", EPJ Web Conf. **205**, 06006 (2019), DOI: 10.1051/epjconf/201920506006.
26. F. Lackner, A. S. Chatterley, B. W. Toulson, D. M. Neumark, S. R. Leone, and O. Gessner, "Ultrafast dissociation dynamics in bromoform molecules initiated by UV (263 nm) excitation and by strong-field ionization are explored using femtosecond XUV transient absorption spectroscopy", EPJ Web Conf. **205**, 06003 (2019), DOI: 10.1051/epjconf/201920506003.
27. J. Mahl, S. Neppl, F. Roth, A. Shavorskiy, N. Huse, H. Bluhm, W. Eberhardt, and O. Gessner, "Real-time probing of charge-transfer induced interfacial fields in a dye-semiconductor system using time-resolved XPS", EPJ Web Conf. **205**, 05021 (2019), DOI: 10.1051/epjconf/201920505021.
28. J. Mahl, S. Neppl, F. Roth, C. Saladrigas, H. Bluhm, J. Guo, W. Yang, H. Nils, W. Eberhardt, and O. Gessner, "Decomposing electronic and lattice contributions in optical pump-X-ray probe transient inner-shell absorption spectroscopy of CuO", EPJ Web Conf. **205**, 04015 (2019), DOI: 10.1051/epjconf/201920504015.
29. Charles Bernando, Rico Mayro P. Tanyag, Curtis Jones, Camila Bacellar, Maximilian Bucher, Ken R. Ferguson, Daniela Rupp, Michael Ziemkiewicz, Luis F. Gomez, Adam S. Chatterley, Tais Gorkhover, Maria Mueller, John Bozek, Sebastian Carron, Justin Kwok, Samuel L. Butler, Thomas Moeller, Christoph Bostedt, Oliver Gessner and Andrey F. Vilesov, "Shapes of rotating superfluid helium nanodroplets", Phys. Rev. B **95**, 064510 (2017), https://doi.org/10.1103/PhysRevB.95.064510.
30. S. Neppl, J. Mahl, A. Shavorskiy, H. Bluhm, and O. Gessner, "Probing charge dynamics in bare and dye-sensitized ZnO nanocrystals with time-resolved XPS", *in* Proceedings, International Conference on Ultrafast Phenomena (2016), https://doi.org/10.1364/UP.2016.UTu4A.13.
31. Florian Lackner, Adam S. Chatterley, Chaitanya D. Pemmaraju, Kristina D. Closser, David Prendergast, Daniel M. Neumark, Stephen R. Leone, and Oliver Gessner, "Direct observation of ring-opening dynamics in strong-field ionized selenophene using femtosecond inner-shell absorption spectroscopy", J. Chem. Phys. **145**, 234313 (2016), http://dx.doi.org/10.1063/1.4972258.

32. Adam S. Chatterley, Florian Lackner, C. D. Pemmaraju, Daniel M. Neumark, Stephen R. Leone, and Oliver Gessner, "Dissociation dynamics and electronic structures of highly excited ferrocenium ions studied by femtosecond XUV absorption spectroscopy", J. Phys. Chem. A **120**, 9509 (2016), http://dx.doi.org/10.1021/acs.jpca.6b09724.
33. Stefan Neppl, Johannes Mahl, Anton S. Tremsin, Bruce Rude, Ruimin Qiao, Wanli Yang, Jinghua Guo, and Oliver Gessner, "Towards efficient time-resolved X-ray absorption studies of electron dynamics at photocatalytic interfaces", Faraday Discuss. **194**, 659 (2016), http://dx.doi.org/10.1039/C6FD00125D.
34. Adam S. Chatterley, Florian Lackner, Daniel M. Neumark, Stephen R. Leone, and Oliver Gessner, "Tracking dissociation dynamics of strong-field ionized 1,2-dibromoethane with femtosecond XUV transient absorption spectroscopy", Phys. Chem. Chem. Phys. **18**, 14644, (2016), http://pubs.rsc.org/en/content/articlelanding/2016/cp/c6cp02598f.
35. Curtis F. Jones, Charles Bernando, Rico Mayro P. Tanyag, Camila Bacellar, Ken R. Ferguson, Luis F. Gomez, Denis Anielski, Ali Belkacem, Rebecca Boll, John Bozek, Sebastian Carron, James Cryan, Lars Englert, Sascha W. Epp, Benjamin Erk, Lutz Foucar, Robert Hartmann, Daniel Neumark, Daniel Rolles, Artem Rudenko, Katrin R. Siefermann, Fabian Weise, Benedikt Rudek, Felix P. Sturm, Joachim Ullrich, Christoph Bostedt, Oliver Gessner, and Andrey F. Vilesov, "Coupled motion of Xe clusters and quantum vortices in He nanodroplets", Phys. Rev. B **93**, 180510(R) (2016), http://journals.aps.org/prb/abstract/10.1103/PhysRevB.93.180510.
36. Oliver Gessner and Markus Gühr, "Monitoring Ultrafast Chemical Dynamics by Time-Domain X-Ray Photo- and Auger-Electron Spectroscopy", Acc. Chem. Res. **49**, 138 (2016), http://pubs.acs.org/doi/abs/10.1021/acs.accounts.5b00361.
37. Rico Mayro P. Tanyag, Charles Bernando, Curtis F. Jones, Camila Bacellar, Ken R. Ferguson, Denis Anielski, Rebecca Boll, Sebastian Carron, James P. Cryan, Lars Englert, Sascha W. Epp, Benjamin Erk, Lutz Foucar, Luis F. Gomez, Robert Hartmann, Daniel M. Neumark, Daniel Rolles, Benedikt Rudek, Artem Rudenko, Katrin R. Siefermann, Joachim Ullrich, Fabian Weise, Christoph Bostedt, Oliver Gessner, and Andrey F. Vilesov, "X-ray coherent diffractive imaging by immersion in nanodroplets", Struct. Dyn. **2**, 051102 (2015), http://scitation.aip.org/content/aca/journal/sdy/2/5/10.1063/1.4933297.
38. Stefan Neppl and Oliver Gessner, "Time-resolved X-ray Photoelectron Spectroscopy Techniques for the Study of Interfacial Charge Dynamics", J. Electron Spectrosc. Relat. Phenom. **200**, 64 (2015), http://dx.doi.org/10.1016/j.elspec.2015.03.002.
39. Michael P. Ziemkiewicz, Daniel M. Neumark, and Oliver Gessner, "Ultrafast electronic dynamics in helium nanodroplets", Int. Rev. Phys. Chem. **34**, 239 (2015), http://dx.doi.org/10.1080/0144235X.2015.1051353.
40. Tiberiu Arion, Stefan Neppl, Friedrich Roth, Andrey Shavorskiy, Hendrik Bluhm, Zahid Hussain, Oliver Gessner, and Wolfgang Eberhardt, "Site-specific probing of charge transfer dynamics in organic photovoltaics", Appl. Phys. Lett. **106**, 121602 (2015), http://dx.doi.org/10.1063/1.4916278.
41. S. Neppl, Y.-S. Liu, C.-H. Wu, A. Shavorskiy, I. Zegkinoglou, T. Troy, D. S. Slaughter, M. Ahmed, A. S. Tremsin, J.-H. Guo, P.-A. Glans, M. Salmeron, H. Bluhm, and O. Gessner, "Toward Ultrafast *In Situ* X-Ray Studies of Interfacial Photoelectrochemistry", *in* Ultrafast Phenomena XIX, Kaoru Yamanouchi, Steven Cundiff, Regina de Vivie-Riedle, Makoto Kuwata-Gonokami, Louis DiMauro, Eds., Springer Proceedings in Physics, vol. 162 (2015), http://link.springer.com/chapter/10.1007/978-3-319-13242-6_79.
42. Stefan Neppl, Andrey Shavorskiy, Ioannis Zegkinoglou, Matthew Fraund, Daniel S. Slaughter, Tyler Troy, Michael P. Ziemkiewicz, Musahid Ahmed, Sheraz Gul, Bruce Rude, Jin Z. Zhang, Anton S. Tremsin, Per-Anders Glans, Yi-Sheng Liu, Cheng Hao Wu, Jinghua Guo, Miquel Salmeron, Hendrik Bluhm, and Oliver Gessner, "Capturing interfacial photo-electrochemical dynamics with picosecond time-resolved X-ray photoelectron spectroscopy",

Faraday Discuss. **171**, 219 (2014), http://pubs.rsc.org/EN/content/articlelanding/2014/fd/c4fd00036f#!divAbstract.
43. Michael P. Ziemkiewicz, Camila Bacellar, Katrin Siefermann, Stephen R. Leone, Daniel M. Neumark, and Oliver Gessner, "Femtosecond time-resolved XUV + UV photoelectron imaging of pure helium nanodroplets", J. Chem. Phys. **141**, 174306 (2014), http://scitation.aip.org/content/aip/journal/jcp/141/17/10.1063/1.4900503.
44. Andrey Shavorskiy, Stefan Neppl, Daniel S. Slaughter, James P. Cryan, Katrin R. Siefermann, Fabian Weise, Ming-Fu Lin, Camila Bacellar, Michael P. Ziemkiewicz, Ioannis Zegkinoglou, Matthew W. Fraund, Champak Khurmi, Marcus P. Hertlein, Travis W. Wright, Nils Huse, Robert W. Schoenlein, Tolek Tyliszczak, Giacomo Coslovich, Joseph Robinson, Robert A. Kaindl, Bruce S. Rude, Andreas Ölsner, Sven Mähl, Hendrik Bluhm, and Oliver Gessner, "Sub-Nanosecond Time-Resolved Ambient-Pressure X-ray Photoelectron Spectroscopy Setup for Pulsed and Constant Wave X-ray Light Sources", Rev. Sci. Instrum. **85**, 093102 (2014), http://scitation.aip.org/content/aip/journal/rsi/85/9/10.1063/1.4894208.
45. Luis F. Gomez, Ken R. Ferguson, James P. Cryan, Camila Bacellar, Rico Mayro P. Tanyag, Curtis Jones, Sebastian Schorb, Denis Anielski, Ali Belkacem, Charles Bernando, Rebecca Boll, John Bozek, Sebastian Carron, Gang Chen, Tjark Delmas, Lars Englert, Sascha W. Epp, Benjamin Erk, Lutz Foucar, Robert Hartmann, Alexander Hexemer, Martin Huth, Justin Kwok, Stephen R. Leone, Jonathan H.S. Ma, Filipe R. N. C. Maia, Erik Malmerberg, Stefano Marchesini, Daniel M. Neumark, Billy Poon, James Prell, Daniel Rolles, Benedikt Rudek, Artem Rudenko, Martin Seifrid, Katrin R. Siefermann, Felix P. Sturm, Michele Swiggers, Joachim Ullrich, Fabian Weise, Petrus Zwart, Christoph Bostedt, Oliver Gessner, Andrey F. Vilesov, "Shapes and Vorticities of Superfluid Helium Nanodroplets", Science **345**, 906 (2014), http://www.sciencemag.org/content/345/6199/906.
46. K. R. Siefermann, C. D. Pemmaraju, S. Neppl, A. Shavorskiy, A. A. Cordones, J. Vura-Weis, D. S. Slaughter, F. P. Sturm, F. Weise, H. Bluhm, M. L. Strader, H. Cho, M.-F. Lin, C. Bacellar, C. Khurmi, J. Guo, G. Coslovich, J. S. Robinson, R. A. Kaindl, R. W. Schoenlein, A. Belkacem, D. M. Neumark, S. R. Leone, D. Nordlund, H. Ogasawara, O. Krupin, J. J. Turner, W. F. Schlotter, M. R. Holmes, M. Messerschmidt, M. P. Minitti, S. Gul, J. Z. Zhang, N. Huse, D. Prendergast, and O. Gessner, "Atomic Scale Perspective of Ultrafast Charge Transfer at a Dye-Semiconductor Interface", J. Phys. Chem. Lett. **5**, 2753 (2014), http://pubs.acs.org/doi/abs/10.1021/jz501264x.
47. Kristina D. Closser, Oliver Gessner, and Martin Head-Gordon, "Simulations of the dissociation of small helium clusters with *ab initio* molecular dynamics in electronically excited states", J. Chem. Phys. **140**, 134306 (2014), http://scitation.aip.org/content/aip/journal/jcp/140/13/10.1063/1.4869193.
48. Ming-Fu Lin, Daniel M. Neumark, Oliver Gessner, and Stephen R. Leone, "Ionization and Dissociation Dynamics of Vinyl Bromide Probed by Femtosecond Extreme Ultraviolet Transient Absorption Spectroscopy", J. Chem. Phys. **140**, 064311 (2014), http://scitation.aip.org/content/aip/journal/jcp/140/6/10.1063/1.4865128.
49. Andrey Shavorskiy, Amy Cordones, Josh Vura-Weis, Katrin Siefermann, Daniel Slaughter, Felix Sturm, Fabian Weise, Matthew Strader, Hana Cho, Ming-Fu Lin, Camila Bacellar, Champak Khurmi, Marcus Hertlein, Jinghua Guo, Hendrik Bluhm, Tolek Tyliszczak, 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.

50. Olga Smirnova and Oliver Gessner, “Attosecond Spectroscopy”, Chem. Phys. **414**, 1 (2013), http://www.sciencedirect.com/science/article/pii/S0301010412004740.
51. 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.
52. 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.
53. 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.
54. J. P. Cryan, J. M. Glownia, 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 N_2”, J. Phys. B: At. Mol. Opt. Phys. **45**, 055601 (2012), http://iopscience.iop.org/0953-4075/45/5/055601/.
55. 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.
56. 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.
57. 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).
58. 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. Glownia, 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.
59. James P. Cryan, J. M. Glownia, 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.
60. James M. Glownia, 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.
61. 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. Glownia, 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.
62. 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.
63. 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.
64. 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.
65. 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.
66. Björn Zimmermann, Daniel Rolles, Burkhard Langer, Rainer Hentges, Markus Braune, Slobodan Cvejanović, Oliver Geßner, Franz Heiser, Sanja Korica, Toralf Lischke, Axel Reinköster, Jens Viefhaus, 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.
67. 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.
68. 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.
69. D. Rolles, M. Braune, S. Cvejanović, O. Geßner, R. Hentges, S. Korica, B. Langer, T. Lischke, G. Prümper, A. Reinköster, J. Viefhaus, 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.
70. 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.
71. D. Rolles, M. Braune, S. Cvejanović, O. Geßner, R. Hentges, S. Korica, B. Langer, T. Lischke, G. Prümper, A. Reinköster, J. Viefhaus, 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.

72. 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.
73. G. Prümper, J. Viefhaus, 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.
74. 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.
75. 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).
76. 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.
77. 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.
78. U. Becker, O. Geßner, A. Rüdel, "Photoelectron scattering in molecules and fullerenes", J. Electron Spectrosc. Relat. Phenom. **108**, 189 (2000), http://www.sciencedirect.com/science/article/B6TGC-40T9H2X-P/2/75bffdd475387fbf7b9fd5861e37b948.
79. O. Gessner, F. Heiser, N.A. Cherepkov, B. Zimmermann, U. Becker, "Photoelectron scattering effects in molecular photoionization", J. Electron Spectrosc. Relat. Phenom. **101-103**, 113 (1999), http://www.sciencedirect.com/science/article/B6TGC-3XHH1CT-N/2/73eeb10003818ee9ac9e27e6bd6775d1.
80. A. Hempelmann, M. N. Piancastelli, F. Heiser, O. Gessner, A. Rüdel, 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/.
81. M. N. Piancastelli, A. Hempelmann, F. Heiser, O. Geßner, A. Rüdel, 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.
82. 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.
83. 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.
84. 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.

85. F. Heiser, O. Geßner, U. Hergenhahn, 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.
86. J. Viefhaus, L. Avaldi, F. Heiser, R. Hentges, O. Gessner, A. Rüdel, 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/.