

# Daniel Hickstein

*PhD student in Chemical Physics at JILA*

## Education

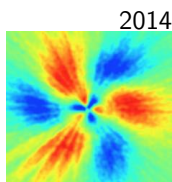
- 2014 **PhD in Chemical Physics**, *University of Colorado*, Boulder, CO, (In progress).
- 2008 **M.Phil in Physics**, *University of Cambridge*, Cambridge, UK.
- 2007 **B.A. in Chemistry**, *Pomona College*, Claremont, CA, *magna cum laude*.  
Minor in mathematics

## Research Experience

- 2008–2014 **Kapteyn–Murnane Research Group**, *JILA – University of Colorado*, Boulder, CO.  
Working with Profs. Henry Kapteyn and Margaret Murnane, I use femtosecond Ti:sapphire lasers to study the dynamics of molecules and nanomaterials on the femtosecond timescale. My thesis centers on extending Velocity Map Imaging (VMI) spectroscopy to nanomaterials and extreme-ultraviolet (EUV) wavelengths.
- 2007–2008 **Cole Research Group**, *Cavendish Laboratory, University of Cambridge*, UK.  
At Cambridge, I worked with Prof. Jacqueline M. Cole to develop new methods to use computational chemistry tools to interpret X-ray diffraction data.
- 2004–2007 **O’Leary Research Group**, *Pomona College*, Claremont, CA.  
I used NMR spectroscopy and computational chemistry to study methathesis catalysts, advised by Prof. Daniel O’Leary
- Summer 2006 **Time and Frequency Division**, *NIST*, Boulder, CO.  
Working with Dr. Elizabeth Donley, I completed an NSF REU at NIST, designing, constructing and testing a nuclear magnetic resonance gyroscope.

## Publications in peer-reviewed journals

### In Progress

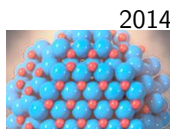


- 2014 **Photoelectron distributions from circularly polarized two-color femtosecond fields**, *Submitted*, Chris Mancuso, Daniel D. Hickstein, Patrick Grychtol, Ofer Kfir, Ronny Knut, Franklin Dollar, Xiao-Min Tong, Dmitriy Zusin, Maithreyi Gopalakrishnan, Christian Gentry, Emrah Turgut, Jennifer L. Ellis, Ming-Chang Chen, Avner Fleischer, Oren Cohen, Henry C. Kapteyn, and Margaret M. Murnane.

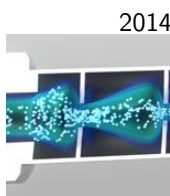
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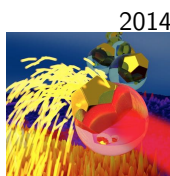


2014 **Solvent-effects on charge-transfer dynamics in quantum dots**, *Submitted*, Jennifer L. Ellis, Daniel D. Hickstein, Kyle Schnitzenbaumer, Brett B. Palm, Jose L. Jimenez, Henry C. Kapteyn, and Margaret M. Murnane, Wei Xiong.



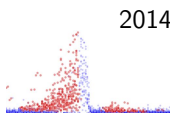
2014 **Soft X-ray photoelectron spectroscopy of nanomaterials in vacuum**, *In preparation*, Daniel D. Hickstein, Jennifer L. Ellis, Wei Xiong, Franklin Dollar, Brett B. Palm, K. Ellen Keister, Chengyuan Ding, Jose L. Jimenez, Henry C. Kapteyn, and Margaret M. Murnane.

### Published



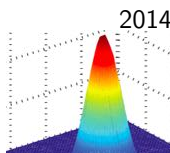
2014 **Mapping nanoscale light absorption using plasma explosion imaging**, *ACS Nano*, **8**, 8810, Daniel D. Hickstein, Franklin Dollar, Jennifer L. Ellis, Kyle J. Schnitzenbaumer, K. Ellen Keister, George M. Petrov, Chengyuan Ding, Brett B. Palm, Jim A. Gaffney, Mark E. Foord, Stephen B. Libby, Gordana Dukovic, Jose L. Jimenez, Henry C. Kapteyn, Margaret M. Murnane, and Wei Xiong.

DOI: [10.1021/nn503199v](https://doi.org/10.1021/nn503199v)



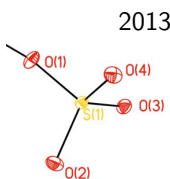
2014 **Observation and control of shock waves in individual nanoplasmas**, *Physical Review Letters*, **112**, 11, Daniel D. Hickstein, Wei Xiong, Franklin Dollar, Jim A. Gaffney, Mark E. Foord, George M. Petrov, Brett B. Palm, K. Ellen Keister, Jennifer L. Ellis, Chengyuan Ding, Stephen B. Libby, Jose L. Jimenez, Henry C. Kapteyn, and Margaret M. Murnane. **Editors' Choice** and **featured in Physics Focus**.

DOI: [10.1103/PhysRevLett.112.115004](https://doi.org/10.1103/PhysRevLett.112.115004)



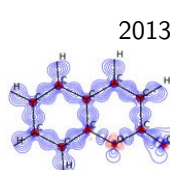
2014 **High flux coherent soft X-ray source driven by a single-stage 10 mJ, KHz, Ti:sapphire laser amplifier**, *Optics Express* **22**, 619, Chengyuan Ding, Wei Xiong, Tingting Fan, Daniel D. Hickstein, Tenio Popmintchev, Xiaoshi Zhang, Mike Walls, Margaret M. Murnane, and Henry C. Kapteyn.

DOI: [10.1364/OE.22.006194](https://doi.org/10.1364/OE.22.006194)



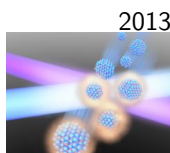
2013 **Molecular origins of nonlinear optical activity in zinc tris(thiourea)sulfate revealed by high-resolution x-ray diffraction data and ab initio calculations**, *Physical Review B*, **88**, 184105, Jacqueline M. Cole and Daniel D. Hickstein.

DOI: [10.1103/PhysRevB.88.184105](https://doi.org/10.1103/PhysRevB.88.184105)



2013 **Modeling electron density distributions from X-ray diffraction to derive optical properties: Constrained wavefunction versus multipole refinement**, *Journal of Chemical Physics*, **139**, 064108, Daniel D. Hickstein, Jacqueline M. Cole, Michael J. Turner, Dylan Jayatilaka.

DOI: [10.1063/1.4817662](https://doi.org/10.1063/1.4817662)



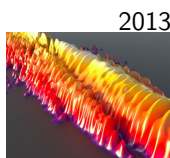
2013 **Photoelectron Spectroscopy of CdSe Nanocrystals in the Gas Phase: A Direct Measure of the Evanescent Electron Wave Function of Quantum Dots**, *Nano Letters*, **13**, 2924, Wei Xiong, Daniel D. Hickstein, Kyle J. Schnitzenbaumer, Jennifer L. Ellis, Brett B. Palm, K. Ellen Keister, Chengyuan Ding, Luis Miaja-Avila, Gordana Dukovic, Jose L. Jimenez, Margaret M. Murnane, and Henry C. Kapteyn.

DOI: [10.1021/nl401309z](https://doi.org/10.1021/nl401309z)

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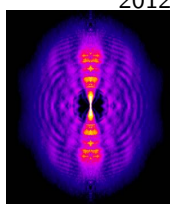
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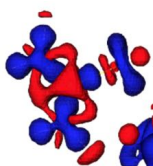
2013

**Influence of Multiple-Scattering and Intra-Half-Cycle Interferences on the Photoelectron Angular Distributions of Atoms Ionized in Mid-Infrared Laser Fields**, *Physical Review A*, **88**, 013410, Xiao-Min Tong, Predrag Ranitovic, Daniel D. Hickstein, Margaret M. Murnane, Henry C. Kapteyn and Nobuyuki Toshima.  
DOI: [10.1103/PhysRevA.88.013410](https://doi.org/10.1103/PhysRevA.88.013410)



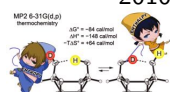
2012

**Direct Visualization of Laser-Driven Electron Multiple Scattering and Tunneling Distance in Strong-Field Ionization**, *Physical Review Letters*, **109**, 073004, Daniel D. Hickstein, Predrag Ranitovic, Stefan Witte, Xiao-Min Tong, Ymkje Huismans, Paul Arpin, Xibin Zhou, K. Ellen Keister, Craig W. Hogle, Bosheng Zhang, Chengyuan Ding, Per Johnsson, N. Toshima, Marc J. J. Vrakking, Margaret M. Murnane, and Henry C. Kapteyn.  
DOI: [10.1103/PhysRevLett.109.073004](https://doi.org/10.1103/PhysRevLett.109.073004)



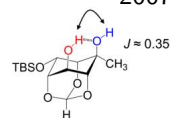
2012

**Identifying and evaluating organic nonlinear optical materials via molecular moments**, *Journal of Applied Physics*, **3**, 033512, Andrew P. Higginbotham, Jacqueline M. Cole, Martin A. Blood-Forsythe, and Daniel D. Hickstein.  
DOI: [10.1063/1.3678593](https://doi.org/10.1063/1.3678593)



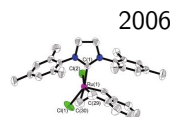
2010

**Theoretical and NMR studies of deuterium isotopic perturbation of hydrogen bonding in symmetrical dihydroxy compounds (Cover article)**, *Journal of Organic Chemistry*, **5**, 1331, Daniel J. O'Leary, Daniel D. Hickstein, Bjarke K. V. Hansen, and Poul Erik Hansen.  
DOI: [10.1021/jo902075z](https://doi.org/10.1021/jo902075z)



2007

**NMR detection of intramolecular OH/OH hydrogen bond networks: an approach using isotopic perturbation and hydrogen bond mediated OH...OH j-coupling**, *Heterocycles*, **72**, 469, Carolyn E. Anderson, Alexander J. Pickrell, Sarah L. Sperry, Thomas E. Vasquez, Thomas G. Custer, Matthew B. Fierman, Daniel C. Lazar, Zachary W. Brown, Wendy S. Iskenderian, Daniel D. Hickstein, and Daniel J. O'Leary.  
DOI: [10.3987/COM-06-S\(K\)40](https://doi.org/10.3987/COM-06-S(K)40)



2006

**Model Compounds of Ruthenium–Alkene Intermediates in Olefin Metathesis Reactions**, *Journal of the American Chemical Society*, **128**, 8386, Donde R. Anderson, Daniel D. Hickstein, Daniel J. O'Leary, and Robert H. Grubbs (2005 Nobel Laureate!).  
DOI: [10.1021/ja0618090](https://doi.org/10.1021/ja0618090)

## Technical skills

- Ultrahigh vacuum design
- Femtosecond lasers
- Quantitative data analysis
- Computational chemistry
- Scientific CCD/CMOS cameras
- Machining
- Ultrafast optics
- Instrument design
- Advanced laboratory plumbing
- Automated instrument control

## Computer skills

Python	Advanced	Word/Excel/PPT	Expert
numpy/scipy	Advanced	LaTeX	Intermediate
Matlab	Advanced	Blender	Intermediate
ImageJ	Advanced	C/Java/Fortran	Basic knowledge

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