

Kevin M. Dorney

Postdoctoral Research Associate

Kapteyn-Murnane Group
JILA – U. of Colorado Boulder

Personal Info/Contact

Citizenship: United States



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Research Summary

- 7+ years exp., ultrafast/CW laser labs with an emphasis in extreme nonlinear optics & ultrafast photoion and magneto spectroscopies
- 2+ years daily supervision, state-of-the-art laser laboratory specializing in high-harmonic generation & ultrafast, nanoscale, AMO dynamics
- Designed, optimized, and maintained state-of-the-art, femtosecond, high-power laser systems (Ti:sapph, mid-IR OPA, UV sources)
- Designed, constructed, & integrated apparatuses/modules experiments in strong-field light-matter interactions
- Computer integration and in-house programming for acquisition and analysis of experimental datasets
- Experienced in a variety of diverse physical and chemical analytical techniques, metrologies, and sensing

Academic Summary

- PhD, University Colorado Boulder, Chemical Physics, 2019
- M.S., Wright State University, Chemistry 2014, *cum laude*
- B.S., Wright State University, Chemistry, 2012, *cum laude*
- B.S., Wright State University, Biology, 2012, *cum laude*

Professional Summary

Proactive and versatile research scientist with a strong mentorship history and a proven track-record of high-quality, collaborative studies that have expanded the frontiers of structured light (*femto-to-atto*, midIR-NIR-VIS-EUV) and its application to uncovering new physics in ultrafast, strong-field light-matter interactions. My current interests include novel waveform control technologies and how tailored light can be applied to uncover new physics in ultrafast, condensed matter dynamics.

Research Positions

Postdoctoral Research Associate, Ultrafast AMO Dynamics **2019-present**

JILA – University of Colorado, Boulder
Kapteyn-Murnane Group

Key Duties: Supervised day-to-day operation of Ultrafast, Nanoscale AMO Dynamics laboratory and personnel. Aided in mentoring graduate (PhD) and undergraduate students, responsible for ordering/purchasing of laboratory materials, project design, planning, and execution, grant writing/fundraising, communication of lab results, aided in maintaining several productive international collaborations.

Graduate Research Assistant and PhD Candidate **2014-2019**

JILA – University of Colorado, Boulder
Kapteyn-Murnane Group

Key Duties: Daily operation and optimization of high-powered Ti:sapphire laser system (9mJ,1kHz,35fs) and optical parametric amplifier, design and implementation of novel extreme ultraviolet lasers based on high-harmonic generation (gas jet, gas cell, waveguide), ultrafast photoelectron/photoion velocity map imaging spectroscopy (2D and 3D), ptychography, ultrafast magneto-optical spectroscopy, computer interfacing and networking, supply ordering, paper/grant writing, precision machining.

Graduate Research Assistant, Surface-Enhanced Raman Spec. **2012-2014**

Wright State University
Pavel-Sizemore Group

Key Duties: Daily operation and optimization of Raman spectrometer system (LabRAMHR, Horiba), micro-Raman hyperspectral imaging/spectroscopy, surface-enhanced Raman spectroscopy, synthesis of colloidal Ag and Au nanoparticles, fluorescence spectroscopy, nanoparticle morphology characterization (TEM, UV-VIS, AFM, ICP-OES).

Academic Study

University of Colorado Boulder **2019-present**

PhD, Chemical Physics

Dissertation: [Strong-Field Physics with a Twist: Structured Ultrafast Optical and High-Harmonic Waveforms with Tailored Spin and Orbital Angular Momentum](#)

Thesis Advisors: Margaret M. Murnane and Henry C. Kapteyn

Wright State University (Dayton, OH, USA) **2012-2014**

M.S., Chemistry

Dissertation: [A Chemical-Free Approach for Increasing the Biochemical Surface-Enhanced Raman Spectroscopy \(SERS\)-based Sensing Capabilities of Colloidal Silver Nanoparticles](#)

Thesis Advisor: Ioana E. P. Sizemore

Wright State University (Dayton, OH, USA) **2008-2012**

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Research Experience

- Ultrafast, high-power laser systems
- Extreme nonlinear optics
- Structured light (SAM/OAM)
- Attosecond physics/dynamics
- Strong-field light-matter interactions
- Time-resolved pump/probe spec
- Photoelectron/ion imaging & spec
- Hyperspectral Imaging (Vis, EUV)
- Chemical, Physical, Optical Metrology

Technical Skills Summary

- Ultrafast laser design/optimization
- Optical beamline design/construction
- Extreme ultraviolet and soft X-ray attosecond pulse generation via HHG
- Spatiotemporal pulse metrology
- Time-resolved, gas-phase/condensed matter spectroscopy (Vis, EUV)
- Instrument interfacing/integration
- Nanoparticle deposition/synthesis
- High-resolution nanomicroscopy
- Computational Modeling (electrodynamics, nonlinear wave-mixing, ray tracing)
- Vacuum design/modeling (Atm-UHV)
- Precision metal machining
- Electrical circuit design/optimization

Comp. Skills Summary



Expert (Python 2.7/3.7)



Advanced (2013a–2018b)



Intermediate (8.0-2018)



Intermediate (9.0-12.0)

Detailed Research Experience

Extensive experience in experimental chemistry and physics research, including bottom-up, wet-chemical synthesis and characterization of nanomaterials, analytical frequency and ultrafast time-domain spectroscopic analysis of surfaces, nanomaterials, molecules, and atoms, ultrafast and continuous-wave laser design, implementation, and servicing (particular to high-peak power, ultrafast regenerative laser amplifiers), optically-based materials characterization and microscopy, non-linear optical generation techniques, metrologies, and spectroscopies, generation and control of structured light from the visible to the extreme ultraviolet, extreme nonlinear phenomena, attosecond science, extreme ultraviolet and x-ray optics, computational modeling and simulation, and precision material machining.

Professional Skills and Techniques

Optical Synthesis, Control and Characterization

- Design/optimization/maintenance of high-power, ultrafast Ti:Sa laser systems
- Ultrafast, high-power optical parametric amplification
- Design/construction of time-resolved, two-color optical beamlines (midIR-NIR-EUV)
 - ⇒ Including vacuum system design/construction
- Supercontinuum generation (gas and solid phase) and nonlinear wave mixing
- Full spatiotemporal characterization of ultrafast complex electric fields:
 - ⇒ Frequency-resolved optical gating (FROG), Phase-retrieval analysis (Gerchberg-Saxton/Ptychography), Beam profilometry
- Synthesis of light fields with designer SAM and OAM (midIR-NIR-EUV, femto-atto)
- Real-time, closed-loop system for beam pointing stabilization

Analytical and Spectroscopic Analysis, Imaging, and Metrology

- Time-resolved Photoelectron and Photoion Imaging and Spectroscopy (2D & 3D VMI, COLTRIMS)
 - ⇒ Including vacuum design, construction, electronics
- Time-Resolved Transient Absorption (NIR-VIS-EUV)
- Fourier-transform Spectroscopy and Imaging (NIR-VIS-UV-EUV)
- Magneto-Optical Spectroscopies
 - ⇒ X-ray and EUV circular dichroism
 - ⇒ Polarization-resolved, element-specific MOKE
- ToF Photoelectron/Photoion Spectroscopy
- Hyperspectral, Ptychographic Imaging
- Nanoparticle synthesis (colloidal and magnetron sputtering)
- Hyperspectral, Micro-Raman Imaging and Spectroscopy
- Surface-Enhanced Raman Spectroscopy
- Linear Absorption Spectroscopy (NIR-VIS-UV-EUV)
- Spectrometer Design and Implementation (midIR-VIS-UV-EUV)
- Spontaneous Emission/Fluorescence
- Single-Crystal X-ray Diffraction
- Transmission Electron Microscopy
- Atomic Force Microscopy
- Inductively-Coupled Plasma Optical Emission Spectroscopy
- Quantitative Atomic Absorption (Flame and Graphite Tube)
- Optical Profilometry
- Fizeau Interferometry
- Vacuum System Design (Atm-UHV)
- Electronic Circuit Design/Optimization

Computational Proficiency

- Python (2.7.x – 3.7.x)
- Origin Pro (8.0 – 2016)

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Digital Media Summary



Advanced (Microsoft Office)



Advanced (Adobe Suite)



Advanced (Blender 3D Mod.)



Advanced (ImageMagick)



Novice (FFmpeg)

Sampled Awards/Honors

- Best Graduate Poster (x3)
 - ⇒ Chemistry and Physics Confs.
- Graduate Teaching Excellence (x2)
 - ⇒ UC Boulder and WSU
- Graduate Student Excellence
 - ⇒ WSU
- Original Work Grant (WSU)
- Finalist, 3-Min Thesis (CU Boulder)

Sampled Certs/Training

- 6+ years of active certifications in chemical and biological safety
- 4+ years as Chemical Safety Officer
- Hazard Waste Generation Safety
- Bloodborne Pathogen Safety
- CPR and First-Aid Certified

Academic Instr. Summary

- Undergraduate Courses Taught
 - ⇒ Gen. Chem. Lab/Recitation (1 yr)
 - ⇒ Phys. Chem. Lab/Recitation (2 yrs)
- Graduate Courses Taught
 - ⇒ Phys. Chem. Lab/Recitation (2 yrs)
 - ⇒ Exp. Nanosci. Lab/Recitation (1 yr)

- ⇒ Including GUI production and instrument interfacing
- Matlab (2013a – 2018b)
 - ⇒ Including GUI production and instrument interfacing
- LabView (8.x – 2018 SP1)
 - ⇒ Including GUI production and instrument interfacing
 - ⇒ Including NI support packages
- Mathematica (9.0 – 12.0)
- Sigmaplot (9.0 – 12.0)
- ImageJ (v1.8)
- RAY-UI X-ray/EUV Beamline Software
- SNLO (**S**elect **N**on**L**inear **O**ptics)
- ReZonator ray-tracing design and optimization software
- SIMION (6.0 – 8.1)
- COMSOL (4.2a)
- AutoCAD (and similar design software)
- Bash/Shell scripting

Digital Multimedia Proficiency

- Microsoft Office Suite
 - ⇒ Word, Excel, PowerPoint, Outlook
- LaTeX
- Adobe Creative Master Suite (CS5 and CS6)
 - ⇒ Photoshop, Illustrator, Encore, InDesign, and others
- Blender (2.76-2.79)
 - ⇒ A free 3D modeling and visualization software for scientific illustrations.
 - ⇒ See here for a representative portfolio of illustrations and animations.
- ImageMagick
 - ⇒ A command-line utility for editing/converting/composing bitmap images.
- ffmpeg
 - ⇒ A command-line utility for recording/converting/streaming audio or video.

Awards and Honors

- Finalist, 3MT Competition (CU Boulder, All Departments) **2019**
- Best Graduate Student Poster (20th Annual CPIA Meeting) **2017**
- Graduate Teaching Excellence Award (CU Boulder) **2015**
- Graduate Student Excellence Award (WSU, All Departments) **2014**
- Original Work Grant (WSU, All Departments) **2014**
- Outstanding Graduate Teaching Assistant (WSU) **2013**
- Best Graduate Poster (ACS Dayton Local Poster Session) **2014**
- Best Spectroscopy Poster (ACS Dayton Local Poster Session) **2014**
- 1st place - Graduate Oral Presentation (6th Annual CSIRC) **2012**

Certifications and Training

- Chemical Safety Officer (Kapteyn-Murnane group, CU Boulder) **2015-present**
- Hazardous Waste Generation (CU Boulder) **2014-present**
- CPR and Emergency First-Aid **2014-present**
- Laser Safety (Wright State University) **2012-2014**
- Laboratory Chemical Safety (Wright State University) **2012-2014**
- Biological Safety (Wright State University) **2012-2014**
- Bloodborne Pathogen Safety (Wright State University) **2012-2014**
- Radiation Safety Awareness (Wright State University) **2012-2014**

Academic Instruction

University of Colorado Boulder

2014-

2015

- *CHEM 1133/4: General Chemistry II Recitation/Lab*
 - ⇒ Two recitations/labs per week, >20 undergraduate students per section
- *CHEM 1113/4: General Chemistry I Recitation/Lab*
 - ⇒ Two recitations/labs per week, >20 undergraduate students per section

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Leadership, Mentorship, and Outreach Summary

Leadership

- Director, CU STEMinar (1 yr)
 - ⇒ Diverse seminar program for STEM students at CU Boulder
 - ⇒ 12 biweekly STEMinar talks /yr
 - ⇒ Budget management (>\$30,000)
 - ⇒ Advertising, recruiting, outreach
 - ⇒ Social media outreach

Mentorship/Student Supervision

- Dylan Zollinger (CU Phys Undergrad)
 - ⇒ 2+ years direct supervision
 - ⇒ Project: Generation and Characterization of Cylindrical Vector Beams
- Jonathan Nesper (SMART REU)
 - ⇒ 3+ mos. direct supervision
 - ⇒ Project: Wavelength Invariant FROG Device
 - ⇒ Presented at FiO+LS 2017
- Sanjana Paul (NSF EUV ERC REU)
 - ⇒ 3+ mos. direct supervision
 - ⇒ Project: Mid-IR spectrometer

Community Outreach

- Senior Grad. Mentor (CU Boulder)
 - ⇒ 2+ years mentorship
 - ⇒ >5 Chem. PhD students mentored during their 1st year
- PISEC Member
 - ⇒ After-school (K-12) program for science education/outreach.
- Community-Oriented Research Talks
 - ⇒ JILAx (TED-style Physics Talk)
 - ⇒ CU PRIME (undergrad Physics)

Wright State University

2012-

2014

- CHEM 451/451L: *Physical Chemistry I: Thermodynamics and Kinetics Recitation/Lab*
 - ⇒ Two recitations/labs per week, >15 senior undergrad students per section
- CHEM 452/452L: *Physical Chemistry II: Quantum Chemistry and Statistical Mechanics Recitation/Lab*
 - ⇒ Two recitations/labs per week, >15 senior undergrad students per section
- CHEM 4680/4680L: *Experimental Nanomaterials and Nanoscience Recitation/Lab*
 - ⇒ One recitation/lab per week, >10 senior undergrad/grad students per section

Leadership, Mentorship, and Outreach

Professional Leadership

Director, [University of Colorado Boulder STEMinar](#)

2018-

2019

- A university-wide program for STEM-oriented grad students and post-docs that serves to increase communication, inclusion, and collaboration via a year-long, biweekly seminar series.
- Brief description of responsibilities and leadership role:
 - ⇒ Organized STEMinar seminar series by advertising talks, recruiting speakers, reserving conference rooms, and hosting seminars (including catering).
 - ⇒ Initiated and maintained a grant award program for speakers and attendees, including selection of award recipients and managing of the grant program budget (>\$7,000 USD).
 - ⇒ Prepared flyers, advertisements, and annual yearly reports summarizing STEMinar statistics, participants, and presentations.
 - ⇒ Managed an annual operating budget of >\$30,000 USD.
 - ⇒ Coordinated social media outreach and managed accounts ([Facebook](#), [Twitter](#), [Instagram](#))
 - ⇒ Applied for, received, and maintained annual student organization grants, totaling in excess of >\$3,000 USD.

Mentorship and Supervision

Dylan Zollinger — CU Undergraduate, REU

2018-

present

- Project: *Generation and Full Spatiotemporal Characterization of Few-Cycle Cylindrical Vector Beams*

Jonathan Nesper — UCF Undergraduate, SMART Program REU

Summer 2017

- Project: *Design and Construction of a Wavelength-Invariant, Frequency-Resolved Optical Gating Device for Pulse Characterization in the UV, Visible, and Infrared*
 - ⇒ This work was presented at the 2017 Frontiers in Optics/Laser Science conference (OSA).

Sanjana Paul — VCU Undergraduate, NSF EUV ERC REU

Summer

2016

- Project: Design and Construction of a Grating-based Mid-Infrared Spectrometer

Community Outreach

- Presenter, JILAx Talks (JILA — CU Boulder)

Summer 2019

- Judge, Colorado STEM Academy Science Fair

Winter

2019

- CHEMunity Senior Graduate Mentor

2017-

2019

- ⇒ Mentored first-year graduate students in the Chemistry PhD program

- Presenter, CU PRIME Semnar Series for Undergraduates in Physics

Winter

2018

⇒ CU STEMinar (STEM community)

⇒ *Using Light Hammers to Crack the Nano-Quantum Eggshell: How Ultra-Intense and X-ray Lasers are Changing the Way We Observe Nature's Smallest, Fastest, and Most Exotic Phenomena*

➤ Presenter, CU Boulder STEMinar Series

Fall 2017

⇒ *How to Create and Control Nature's Most Exotic Light Source: X-ray and Attosecond Light Science at the Molecular, Nano, and Atomic Frontiers*

➤ Member, PISEC

Spring 2016

⇒ Partnership for Informal Scientific Education in the Community, an NSF Frontier Center after-school program for local, K-12 students.

Synergism Summary

- Referee
 - ⇒ Nat. Photonics, PNAS (USA), Spectros. Lett., JOSA B
- Professional Organizations
 - ⇒ OSA (2+ years)
 - ⇒ ACS (2+ years)

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Publication Summary

- >600 cites (Google Scholar)
- >10 H index (>10 papers w/ 10 cites)

Synergistic Activities

Referee Activity: Nature Photonics, Proceedings of the National Academy of Sciences (USA), Journal of the American Optical Society B, Spectroscopy Letters, Optics Letters, Photonics Research

Professional Organizations: Optical Society of America (Member, 2017-present), American Chemical Society (Member, 2012-2014)

Publication Profile

Google Scholar: >9 H index (9 papers w/ >9 cites), >8 i-10 index (8 papers w/ >10 cites), >510 citations (*Updated June 2019*)

Peer Reviewed Publications: 19 coauthored or authored

Conference Proceedings: 16 coauthored or authored (>40 Abstracts, Posters, Talks)

Collaborators (w/ Publications): C. Hernández-García, J. San Román, A. Picón, L. Plaja (U. Salamanca, Spain), E. Pisanty, M. Lewenstein (ICFO, Spain), J. Shaw (NIST Boulder), S. Witte (VU Amsterdam and ARCNL), C. Durfee (MINES), J. L. Chaloupka (UNC, Colorado), A. Becker, A. Jaroń-Becker (JILA), O. Cohen (Technion), P. Oppeneer (Uppsala), D. Milošević (U. Sarajevo), X.-M. Tong (U. Tsukuba), W. Li (Wayne State University, Michigan), W. Becker (MBI, Nonlinear Optic/Short Pulse Spec.)

Refereed Publications

- >10 i-10 index (>10 papers w/ 10 cites)

• Journal Summary

- ⇒ Science
- ⇒ Nat. Photonics (x2)
- ⇒ Phys. Rev. Lett. (x3)
- ⇒ Phys. Rev. A (x2)
- ⇒ Optica
- ⇒ PNAS (USA)
- ⇒ J. Chem. Phys.
- ⇒ Phys. Chem. Lett.
- ⇒ J. Chem Educ. (x2)

• Conference Proceedings Summary

- ⇒ Nonlinear Optics (OSA, 2015, 2019)
- ⇒ CLEO USA (OSA, 2015-2019)
- ⇒ Ultrafast Optics (OSA, 2017)
- ⇒ Ultrafast Phenomenon (2016)
- ⇒ OSA High-Brightness Sources and Light-Driven Interactions (2016, 2018)

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21. N. J. Brooks, Q. L. Nguyen, J. L. Ellis, C. Gentry, D. Zusin, D. D. Hickstein, J. M. Shaw, C. Hernández-García, H. C. Kapteyn, M. M. Murnane, and **K. M. Dorney** "Hyperspectral Imaging of Magnetic Thin Films via Extreme Ultraviolet Fourier Transform Spectroscopy." *In preparation*. 2019.

20. Q. L. Nguyen, J. L. Ellis, D. D. Hickstein, N. J. Brooks, A. N. Grennell, F. J. Dollar, G. Dukovic, S. Yazdi, E. B. Campbell, H. C. Kapteyn, M. M. Murnane, and **K. M. Dorney**. "Time-Resolved Strong-Field Photoemission of Metallic, Ligand-Free, Nanoparticles in the Gas Phase." *In preparation*. 2019.

19. **K. M. Dorney**, T. Fan, L. Rego, J. L. Ellis, D. D. Hickstein, N. J. Brooks, C. A. Mancuso, D. Zusin, C. Gentry, P. Grychtol, R. Knut, T. Popmintchev, C. Hernández-García, D. B. Milošević, H. C. Kapteyn, and M. M. Murnane. "Harnessing electronic structure effects for polarization sculpted, attosecond high-harmonic waveforms via bicircular high-harmonic generation." *In preparation*. 2019.

18. L. Rego*, **K. M. Dorney***, N. J. Brooks, Q. L. Nguyen, C.-T. Liao, J. San Román, D. C. Couch, A. Liu, E. Pisanty, M. Lewenstein, L. Plaja, H. C. Kapteyn, M. M. Murnane, and C. Hernández-García. "Generation of extreme ultraviolet beams with time-varying orbital angular momentum." [Science](#). **364** (6447), [eaaw9486](#) (2019).

⇒ *These authors contributed equally to this work.

⇒ Featured on [Science cover](#) and in international media outlets: ([BBC](#), [Nat. Geo.](#), [New Scientist](#), [El País](#), [El Mundo](#), [Phys.org](#), [NRC Handelsblad](#))

17. E. Pisanty, L. Rego, J. San Román, A. Picón, **K. M. Dorney**, H. C. Kapteyn, M. M. Murnane, L. Plaja, M. Lewenstein, and C. Hernández-García. "Conservation of torus-knot angular momentum in high-order harmonic generation." [Phys. Rev. Lett.](#) **122**, [203201](#) (2019).

16. **K. M. Dorney**, L. Rego, N. J. Brooks, J. San Román, C.-T. Liao, J. L. Ellis, D. Zusin, C. Gentry, Q. L. Nguyen, J. M. Shaw, A. Picón, L. Plaja, H. C. Kapteyn, M. Murnane, and C. Hernández-García. "Controlling the polarization and vortex charge of attosecond high-harmonic beams via optical spin-orbit momentum coupling". [Nat. Photonics](#) **1**, [123-130](#) (2019).

15. Y. Esashi, B. Wang, N. J. Brooks, **K. M. Dorney**, C.-T. Liao, C. Hernández-García, H. C. Kapteyn, D. Adams, and M. M. Murnane. "Multiplexed two-color phase-and-amplitude characterization of harmonic up-conversion in OAM beams using ptychography". [Opt. Express](#). **26** (26), [34007-340015](#) (2018).

14. J. Ellis, **K. Dorney**, D. Hicsktien, N. Brooks, C. Gentry, C. Hernández-García, D. Zusin, J. Shaw, Q. Nguyen, C. Mancuso, G. Matthijs-Jansen, S. Witte, H. Kapteyn, and M. Murnane. "High harmonics with spatially varying ellipticity". [Optica](#) **5** (4), [479](#) (2018).

13. **K. M. Dorney**, J. Ellis, C. Hernández-García, D. Hickstein, C. Mancuso, N. Brooks, T. Fan, G. Fan, D. Zusin, C. Gentry, P. Grychtol, H. C. Kapteyn, and M. Murnane. "Helicity-selective enhancement and polarization control of attosecond high-harmonic waveforms driven by bichromatic circularly polarized laser fields". [Phys. Rev. Lett.](#) **119** (6), [063201](#) (2017).

12. J. L. Ellis, **K. M. Dorney**, C. G. Durfee, C. Hernández-García, F. J. Dollar, C. A. Mancuso, T. Fan, D. Zusin, C. Gentry, P. Grychtol, H. C. Kapteyn, M. M. Murnane, and D. D. Hickstein. "Phase matching of noncollinear difference frequency high harmonic generation above and below the critical ionization level". [Opt. Express](#). **25** (9), [10126](#) (2017).

11. C. M. Mancuso, **K. M. Dorney**, D. D. Hickstein, J. L. Chaloupka, X.-M. Tong, J. L. Ellis, H. C. Kapteyn, and M. M. Murnane. "Observation of ionization enhancement in two-color circularly polarized laser fields". [Phys. Rev. A](#). **96**, [003400](#) (2017).

10. L. Fan, S. K. Lee, Y.-J. Tu, B. Mignolet, D. Couch, **K. M. Dorney**, Q. Nguyen, L. Wooldridge, M. Murnane, F. Remacle, H. B. Schlegel, and W. Li. "A new electron-ion coincidence 3D momentum-

imaging method and its application in probing strong field dynamics of 2-phenylethyl-N, N-dimethylamine". [J. Phys. Chem. 147, 013920](#) (2017).

9. C. A. Mancuso, **K. M. Dorney**, D. D. Hickstein, J. L. Chaloupka, J. L. Ellis, F. J. Dollar, R. Knut, P. Grychtol, D. Zusin, C. Gentry, M. Gopalakrishnan, H. C. Kapteyn, and M. M. Murnane. "Controlling nonsequential double ionization in two-color circularly polarized femtosecond laser fields". [Phys. Rev. Lett. 117 \(13\), 133201](#) (2016).

8. C. A. Mancuso, D. D. Hickstein, **K. M. Dorney**, J. L. Ellis, E. Hasović, R. Knut, P. Grychtol, C. Gentry, M. Gopalakrishnan, D. Zusin, F. J. Dollar, X.-M. Tong, D. Milošević, W. Becker, H. C. Kapteyn, and M. M. Murnane. "Controlling electron-ion rescattering in two-color circularly polarized femtosecond laser fields". [Phys. Rev. A. 93 \(5\), 053406](#) (2016).

7. J. L. Ellis, D. D. Hickstein, W. Xiong, F. J. Dollar, B. B. Palm, K. E. Keister, **K. M. Dorney**, C. Ding, T. Fan, M. B. Wilker, K. J. Schnitzenbaumer, G. Dukovic, J. L. Jimenez, H. C. Kapteyn, and M. M. Murnane. "Materials properties and solvated electron dynamics of isolated nanoparticles and nanodroplets probed with ultrafast extreme ultraviolet beams". [J. Phys. Chem. Lett. 7 \(4\), 609](#) (2016).

6. A. J. Blake, **K. M. Dorney**, I. E. P. Sizemore, and H. Huang. "Microstructures of reduced graphene oxide/sulfur nanocomposites and their impacts on lithium storage properties". [J. Nanomater. 1](#) (2015).

5. S. W. Brittle, J. D. Baker, **K. M. Dorney**, J. M. Dagher, T. Ebrahimian, S. R. Higgins, and I. E. P. Sizemore. "Measuring the silver composition of nanocolloids by inductively coupled plasma-optical emission spectroscopy: A laboratory experiment for chemistry and engineering students". [J. Chem. Educ. 92 \(6\), 1061](#) (2015).

4. D. D. Hickstein, F. J. Dollar, P. Grychtol, J. L. Ellis, R. Knut, C. Hernández-García, D. Zusin, C. Gentry, J. M. Shaw, T. Fan, **K. M. Dorney**, A. Becker, A. Jaron-Becker, H. C. Kapteyn, M. M. Murnane, and C. G. Durfee. "Non-collinear generation of angularly isolated circularly polarized high harmonics". [Nat. Photonics. 9, 743](#) (2015).

3. T. Fan, P. Grychtol, R. Knut, C. Hernández-García, D. D. Hickstein, D. Zusin, C. Gentry, F. J. Dollar, C. A. Mancuso, C. W. Hogle, O. Kfir, D. Legut, K. Carva, J. L. Ellis, **K. M. Dorney**, C. Chen, O. G. Shpyrko, E. E. Fullerton, O. Cohen, P. M. Oppeneer, D. B. Milošević, A. Becker, A. A. Jaron-Becker, T. Popmintchev, M. M. Murnane, and H. C. Kapteyn. "Bright circularly polarized soft X-ray high harmonics for X-ray magnetic circular dichroism". [Proc. Natl. Acad. Sci. U.S.A. 112 \(46\), 14206](#) (2015).

2. **K. M. Dorney**, J. D. Baker, M. L. Edwards, S. R. Kanel, M. O'Malley, and I. E. P. Sizemore. "Tangential flow filtration of colloidal silver nanoparticles: a "green" laboratory experiment for chemistry and engineering students". [J. Chem. Educ. 91 \(7\), 1044](#) (2014).

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[‡]Invited Talk

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