

Scott G. Sayres

Physical Sciences C153
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FACULTY APPOINTMENTS

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| Assistant Professor, Arizona State University
School of Molecular Sciences
Arizona State University, Tempe, AZ, USA | Sep. 2016 - Present |
| Assistant Professor, Arizona State University
Biodesign Center for Applied Structural Discovery
Arizona State University, Tempe, AZ, USA | Sep. 2016 - Present |
| Assistant Research Professor, Arizona State University
School of Molecular Sciences
Arizona State University, Tempe, AZ, USA | Aug. 2014 - Sep. 2016 |
| Assistant Research Professor, Arizona State University
The Biodesign Institute's Center for Applied Structural Discovery
Arizona State University, Tempe, AZ, USA | Aug. 2014 - Sep. 2016 |

EDUCATION AND TRAINING

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| Postdoctoral Research Associate
University of California, Berkeley
Advisor: Stephen R. Leone | May 2011 – Aug 2014 |
| Postdoctoral Research Associate
The Pennsylvania State University
Advisor: A. W. Castleman, Jr. | Aug 2010 – May 2011 |
| Ph.D. Chemistry
The Pennsylvania State University
Advisor: A. W. Castleman, Jr.
Thesis: "The Strong-Field Ionization Mechanisms of Molecules and Clusters" | August 2010 |
| B.S., Double Major: Mathematics and Chemistry
Shippensburg University, Graduated <i>cum laude</i> | May 2004 |

PUBLICATIONS

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12. M. Sabbar, H. Timmers, Y.-J. Chen, A.K. Pymer, Z.-H. Loh, **S. G. Sayres**, S. Pabst, R. Santra, S. R. Leone, "State-resolved attosecond reversible and irreversible dynamics in strong optical fields", *Nature Physics*, **13**, 472-478 (2017).
 11. **S. G. Sayres**, E. R. Hosler, S. R. Leone. Exposing the Role of Electron Correlation in Strong-Field Double Ionization: X-ray Transient Absorption of Orbital Alignment in Xe⁺ and Xe²⁺. *J. Phys. Chem. A* **118**, 8614-8624 (2014).
 10. A. N. Pfeiffer, **S. G. Sayres**, S. R. Leone, Calculation of valence electron motion induced by

- sequential strong field ionization. *Mol. Phys.* **111**, 2283-2291 (2013).
9. D. E. Blumling*, **S. G. Sayres***, M. W. Ross, A. W. Castleman Jr. Strong-field ionization of small niobium and tantalum clusters. *Int. J. Mass. Spectrom.*, **333**, 55-58 (2013). ***These authors contributed equally to this work**
 8. **S. G. Sayres**, M. W. Ross, A. W. Castleman Jr., Onset of Coulomb explosion in small silicon clusters exposed to strong-field laser pulses. *New Journal of Physics*, **14**, 055014 (2012).
 7. V. Brites, K. Franzreb, J. N. Harvey, **S. G. Sayres**, M. W. Ross, D. E. Blumling, A. W. Castleman Jr., and M. Hochlaf, Oxygen-containing gas-phase diatomic trications and tetracations: ReO^{z+} , NbO^{z+} and HfO^{z+} ($z = 3, 4$). *Phys. Chem. Chem. Phys.* **13**, 15233-15243 (2011).
 6. **S. G. Sayres**, M. W. Ross, A. W. Castleman, Jr. Delocalized electronic behavior observed in transition metal oxide clusters under strong-field excitation. *J. Chem. Phys.* **135**, 054312 (2011).
 5. **S. G. Sayres**, M. W. Ross, A. W. Castleman Jr. Influence of clustering and molecular orbital shapes on the ionization enhancement in ammonia. *Phys. Chem. Chem. Phys.* **13**, 12231-12235 (2011). ***Selected as a hot article**
 4. D. E. Blumling*, **S. G. Sayres***, A. W. Castleman Jr. Strong-field ionization and dissociation studies on small early transition metal carbide Clusters via time-of-flight mass spectrometry. *J. Phys. Chem. A*, **115**, 5038-5043 (2011). ***These authors contributed equally to this work.**
 3. D. E. Blumling*, **S. G. Sayres***, A. W. Castleman Jr. Strong-field ionization and dissociation of small early transition metal oxide clusters. *Int. J. Mass. Spectrom.* **300**, 74-80 (2011). ***These authors contributed equally to this work.**
 2. **S. G. Sayres**, M. W. Ross, A. W. Castleman Jr. Ultrafast ionization and fragmentation of molecular silane. *Physical Review A*, **82**, 033424 (2010).
 1. S. J. Peppernick, D. D. K. Gunaratne, **S. G. Sayres**, A. W. Castleman Jr. Photoelectron imaging of small silicon cluster anions, Si_n^- ($n=2-7$). *J. Chem. Phys.*, **132**, 044302-044313 (2010).

HONORS AND AWARDS

Koerner Dissertation Award	2011
First Place Award, Graduation Exhibition Poster Competition, The Pennsylvania State University	2010
Dan H. Waugh Memorial Teaching Award, Honorable Mention	2005
Roberts Graduate Fellowship	2004
PSECU Student Award	2004
Clarence-Shock Award	2004
SICO Scholarship Award	2000-2003

TEACHING EXPERIENCE

Arizona State University

SES494 Special Topics	Spring 2015
CHE392 Special Topics	Spring 2015
CHM348 Physical Chemistry Lab	Fall 2015
CHE499 Individualized Instruction	Fall 2015
CHM191 Freshman Academic success course (Guest Lecture – Oct. 28)	Fall 2015
PHY191 Freshman Physics (Guest Lecture – Oct.5)	Fall 2015
SES499 Individualized Instruction	Spring 2016
CHE592 Research	Fall 2016
EGR499 Topic: Study of femtochemistry	Fall 2016

PHY495 Project Research	Fall 2016
CHM392 Intro to Research Techniques	Fall 2016
BCH392 Intro to Research Techniques	Fall 2016
CHM792 Research	Fall 2016
CHM191 Freshman Academic success course (Guest Lecture – Sep.23)	Fall 2016
CHM191 Freshman Academic success course (Guest Lecture – Oct.21)	Fall 2016
PHY191 Freshman Physics (Guest Lecture – Oct.14)	Fall 2016
PHY191 Freshman Physics (Guest Lecture – Oct.31)	Fall 2016
CHE599 Thesis	Spring 2017
CHM546 Molecular Spectroscopy/Group Theory	Spring 2017
PHY495 Project Research	Spring 2017
CHM392 Undergrad Research Class	Spring 2017
CHM792 Research	Spring 2017

The Pennsylvania State University

Teaching assistant, Chemistry Dynamics, CHEM110	Spring 2005, Fall 2006
Teaching assistant, Experimental Chemistry I laboratory, CHEM111	Fall 2004
Teaching assistant, Experimental Chemistry II laboratory, CHEM113	Spring 2005

MENTORING EXPERIENCE

Graduate Students, Arizona State University

Currently mentoring 4 Chemistry Ph.D. Candidates
1 Chemical Engineering Masters Candidate

DEPARTMENTAL/UNIVERSITY SERVICE ACTIVITY

2017	Faculty Poster Committee, Fusion 2017 Biodesign Scientific Retreat (April 7)
2017	Governance Board Member - ASU Chemical & Environmental Characterization (CEC) Core Facility

SCIENCE OUTREACH AND VOLUNTEERING

2017	Participated in the Animating Research class , developed by Liz Lerman, Institute Professor Herberger Institute for Design and the Arts to bring artists into contact with researchers.
2017	Basha High School (Chandler, AZ): (April 4). Reviewed student projects from the Honors Science Research Students projects and posters to help prepare them for the Arizona Science and Engineering Fair.
2017	Night of the Open Door, ASU: (Feb 25) Organized an interactive scientific activity for School of Molecular Sciences called "Principles of Lasers". I developed three new outreach demonstrations: 1) Ruben's Tube, 2) Infinity Mirror, 3) Star Lasers. (Feb. 25, 2017)
2016	Homecoming Block Party, ASU: October 22. Organized an interactive scientific activity for School of Molecular Sciences
2016	Intel ISEF, Phoenix: May 10-11. Grand Awards Judge, Physics and Astronomy.
2016	Sundial Science Conference, ASU: April 23. Organized and presented the Grand Demonstration.

- 2016, 3/31 **Basha High School** (Chandler, AZ): Reviewed student projects from the Honors Science Research Students projects and posters to help prepare them for the Arizona Science and Engineering Fair.
- 2016 **Night of the Open Door, ASU**: Organized an interactive scientific activity for School of Molecular Sciences called "Principles of Lasers". I developed three new outreach demonstrations: 1) Ruben's Tube, 2) Infinity Mirror, 3) Star Lasers (Feb. 27, 2015). Highlighted in ASU NOW: <https://asunow.asu.edu/20160228-sun-devil-life-night-open-door-tempe-campus>
- 2015 **Homecoming Block Party, ASU**: Organized an interactive scientific activity for School of Molecular Sciences. (Nov. 14, 2015)
- 2015 **Night of the Open Door, ASU**: Organized an interactive scientific activity for Biodesign. (Feb. 28, 2015)
- 2010 **USA Science and Engineering Festival, National GWIS event**: Helped plan an interactive scientific activity for approximately 10,000 participants on the DC Mall.
- 2010 **State College High School Workshop Organizer**: Organized an introduction to lasers workshop and laboratory tour for high school students.
- 2008-2011 **Girl Scout Workshop**: Participated in a biannual science outreach workshop, serving 50 7th-12th grade Girl Scouts each workshop.

NATIONAL SERVICE ACTIVITY

Conference Organizer

American Physical Society Four Corners Meeting, October 16-18, 2015
 Chair of Atomic, Molecular, Optics Session
 AMO organizing Committee

Conference Organizer

American Chemical Society Western Regional Meeting, November 6-8, 2015
 Presiding over Physical Chemistry Session

Peer Review

New Journal of Physics
 American Physics Society: Phys. Rev A
 Optics Express
 Journal of Physics B: Atomic, Molecular and Optical Physics
 Journal of Electron Spectroscopy and Related Phenomena
 Chemical Physics
 Physical Review Letters
 Journal of Physical Chemistry Letters
 Journal of Condensed Matter
 Physical Review A:

Professional Affiliations

2014-present Optical Society America
 2011-present American Association for the Advancement of Science
 2008-present American Chemical Society
 2008-present American Physical Society
 2008-2009 Graduate Women in Science

INVITED PRESENTATIONS

- S. G. Sayres, Strong-field ionization of Clusters and observing electron motions with X-rays. **Invited speaker** Castleman Symposium, National Academy of Sciences, Washington D.C., April 20-21th, 2017.
- S. G. Sayres, Compact X-ray and ultrafast electron sources for future applications: HHG Program at ASU. **Invited speaker** at DESY-ASU Workshop, DESY Germany, April 28th, 2016.
- S. G. Sayres, Fundamental Concepts of Matter at the Atomic Scale: Electronic Processes in Strong-field Ionization. **Invited speaker** at DESY-ASU Workshop, DESY Germany, April 29th, 2016.
- S. G. Sayres, Intense Light-Matter Interaction: How electron spin can influence strong-field ionization. **Invited speaker**, Physics Departmental Seminar at University of Arizona, Tuscon, AZ, November 19th, 2015.
- S. G. Sayres, Intense light-matter interaction: How electron spin can influence strong-field ionization. **Invited speaker** at American Physical Society Four Corners Conference, Tempe, AZ, October 17th, 2015.
- S. G. Sayres, Lasers, Molecules, and Mathematics: Ultrafast Electron Motion Explored With Intense Light-Matter Interaction. **Invited speaker for Mathematics Seminar** at Shippensburg University, Shippensburg, PA, October 8th, 2015.
- S. G. Sayres, Exploring the role of electron correlation during strong-field excitation using tabletop XUV spectroscopy. **Invited speaker** at Compact Attosecond X-ray Sources and Applications (CoAXSA), Hamburg, Germany, July 20, 2015.
- S. G. Sayres, Ultrafast Intense Light-Matter Interaction: Correlated Electron Dynamics and Molecular Fireworks. **Invited seminar speaker** at The Department of Chemistry and Biochemistry, Arizona State University, January 23, 2015.
- S. G. Sayres, *Correlated Electron Dynamics and Strong-Field Ionization*. **Invited speaker** at Physics Department, Auburn University, Auburn, AL, April 2014.
- S. G. Sayres, *Extreme Ionization of Clusters by Femtosecond Laser Pulses Leading to Coulomb Explosion*. **Invited speaker** at Chemistry Department Seminar, University of Nebraska- Lincoln, Lincoln, NE, November 26, 2012.