

# Curriculum Vitae

## Kristin S Dooley

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### Most Recent Position

- **Assistant Professor**, Department of Chemistry  
*University of Central Arkansas, Conway, Arkansas*  
*August 2012-Present*
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### Education

- **Ph.D. in Physical Chemistry**  
Department of Chemistry, *Texas A&M University, College Station, Texas*
    - Graduated May **2009** (GPA: 4.0/4.0)
    - Dissertation: Velocity Map Ion Imaging: Applications in understanding halogen oxide photochemistry (Advisor: Prof. S. W. North)
  - **Bachelor of Science in Chemistry and Applied Mathematics**  
Minor: Honors Interdisciplinary Studies  
*University of Central Arkansas, Conway, Arkansas*
    - Graduated May **2004** with magna cum laude honors
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### Teaching Experience

Fall 2010-Spring 2012

#### **Visiting Assistant Professor**

*Univ. of Central Arkansas, Conway, AR*

Taught various general chemistry courses including: College Chemistry I and II, Fundamentals of Chemistry, and General Chemistry for non-majors. Currently serving as a faculty co-advisor for the UCA student ACS chapter.

- June 2007-June 2008      **GK-12 Fellow**  
*Texas A&M, College Station, TX*  
Enriched the science instruction of 5<sup>th</sup> grade students by working alongside classroom teachers to develop and implement activities and teaching methods to enhance the science classroom.
- Spring 2007      **Teaching Assistant**  
*Texas A&M, College Station, TX*  
Instructed undergraduate laboratories in physical chemistry.
- Fall 2006      **Experiment Development**  
*Texas A&M, College Station, TX*  
Assisted in developing and setting up new laboratory experiments for the physical chemistry laboratory.
- Spring 2006      **Teaching Assistant**  
*Texas A&M, College Station, TX*  
Instructed undergraduate laboratories in physical chemistry for chemistry majors.
- Fall 2004 – Spring 2005      **Teaching Assistant**  
*Texas A&M, College Station, TX*  
Instructed undergraduate laboratories in an introductory level chemistry course for prospective engineering majors.
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## **Research Experience**

- August 2012-Present      **Assistant Professor**  
*University of Central Arkansas, Conway, AR*
  - Cavity Ring-Down Spectroscopy (CRDS) is an ultrasensitive absorption technique that is used extensively in environmental measurements where its sensitivity is exploited. My research focuses on the measurement of optical properties of aerosols which depend on the size, shape, and composition of the particles, and dictate the warming or cooling effects on our climate.
- June 2009-July 2010      **Postdoc Research Associate**  
*Arkansas State University, State University, AR*  
Supervisor: Professor Susan Davis Allen
  - Laser Induced Breakdown Spectroscopy (LIBS) is enhanced with the use of an IR laser. This mechanism of this enhancement is characterized. A possible application of this research is the stand-off detection of explosive residues on motor vehicles as they pass a checkpoint.
  - The use of UV LEDs and titanium dioxide is studied for its use in photocatalytic destruction of biological agents, specifically the anthrax-like spores, *B. Subtilis*. A possible application is found in military and medical facility air filtration systems.

May 2005 – May 2009 **Graduate Research Assistant**

*Texas A&M, College Station, TX*

Advisor: Professor Simon W. North

Halogen oxide radical species (XO) are studied in a molecular beam using the Velocity Map Ion Imaging (VELMI) technique. Radical species are made in situ using various solenoid pulsed valve assemblies. Recent work has focused on:

- The Bond Dissociation Energy (BDE) measurement of IO and BrO, which are thermochemical quantities that are needed for accurate atmospheric modeling.
- The study of the photodissociation dynamics of ClO and BrO, which provide insight into the strengths and limitations of current quantum calculations.

May 2002 - May 2004 **Undergraduate Research Assistant**

*University of Central Arkansas, Conway, AR*

Advisor: Professor William S. Taylor

Reactions of metal ions with various CFC species were studied using a drift cell technique in a quadrupole mass spectrometer. Positive metal ions produced with a glow discharge source were directed into a drift cell charged with 3-4 torr He and a small partial pressure of the neutral CFC species. The goals of this project were to:

- Understand the mechanisms of the reactions of CFC species with metal ions.
- Determine bimolecular rate constants for these reactions.

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## Affiliations

- American Chemical Society
- Phi Lambda Upsilon (Chemical Honor Society)
  - Secretary 2007-2008

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## Honors and Awards

- First Place Session Winner and Chemical Sciences Taxonomy First Place Winner for Outstanding Oral Presentation (Student Research Week, Texas A & M University, 2009)
- Environmental Health and Safety Department Recognition for Oral Presentation (Student Research Week, Texas A & M University, 2009)
- Senator Phil Gramm Doctoral Fellowship (Texas A & M University, 2008)
- NSF GK-12 Fellowship (Texas A & M University, 2007)
- Welch Foundation Scholarship (Texas A & M University, 2004)

- College of Natural Sciences and Mathematics Most Outstanding Student (May 2004, University of Central Arkansas)
  - Undergraduate Research Grant for Education (University of Central Arkansas Honors College, 2002)
  - National Merit Finalist Scholarship (University of Central Arkansas, 1999)
  - Arkansas Academic Challenge Scholarship (University of Central Arkansas, 1999)
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## Service

- February 2012-Present  
Judging Coordinator, Arkansas State Science Fair, Conway, Arkansas
  - August 2011-Present  
Co-Advisor, UCA American Chemical Society Student Chapter
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## Presentations

Hendrix College Seminar Series (Conway, AR September 24, 2012) (Oral Presentation)  
“Photodissociation Dynamics of Halogen Oxide Species” **Kristin S. Dooley**

Student Research Week (College Station, TX, March 2009) (Oral Presentation) “Direct Measurement of the Bond Dissociation Energy of IO Using Velocity Map Ion Imaging” **Kristin S. Dooley**, Justine N. Geidosch, and Simon W. North *\*Award of First Place in Division*

235<sup>th</sup> National ACS Meeting (New Orleans, LA, April 2008) (Poster) “Vibrational state-dependent predissociation dynamics of ClO ( $A^2\Pi_{3/2}$ ): Insight from final correlated state branching ratios” **Kristin S. Dooley**, Justine N. Geidosch, Hahkjoon Kim, Gerrit C. Groenenboom, and Simon W. North

Dynamics of Molecular Collisions XXI Conference (Santa Fe, NM, July, 2007) (Poster)  
“Vibrational state-dependent predissociation dynamics of ClO ( $A^2\Pi_{3/2}$ ): Insight from the final correlated state branching ratios,” **Kristin S. Dooley**, Justine N. Geidosch, Hahkjoon Kim, Gerrit C. Groenenboom, and Simon W. North

Industry-University Cooperative Chemistry Program (IUCCP) (College Station, TX, October 2006 and October 2007) (Posters).

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## Mentored Student Presentations

American Chemical Society National Meeting (San Diego, CA, March 2012) (Poster Session) "Increasing visibility on campus; Recruiting and maintaining motivated members." Yarberrry F. M., Steelman K. L., Dooley, K. S., Phomakay, V., Wallace, A., McKinney, A., Primm, K., and Wilkerson, J.

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## Publications

Erin E. Greenwald, Buddhadeb Ghosh, Katie C. Anderson, Kristin S. Dooley, Peng Zou, Tabitha Selby, David L. Osborn, Giovanni Meloni, Craig A. Taatjes, Fabien Goulay, Stephen R. Leone, and Simon W. North, "Isomer-Selective Study of the OH-Initiated Oxidation of Isoprene in the Presence of O<sub>2</sub> and NO: The Minor OH-Addition Channel" *Journal of Physical Chemistry A*, 114, 904 (2010).

Kristin S. Dooley, Justine N. Geidosch, and Simon W. North "Ion Imaging Study of IO Radical Photodissociation" *Chemical Physics Letters*, 457, 4, (2008).

Hahkjoon Kim, Kristin S. Dooley, Simon W. North, Gregory E. Hall, and Paul L. Houston "Anisotropy of Photofragment Recoil as a Function of Dissociation Lifetime, Excitation Frequency, Rotational Level and Rotational Constant" *Journal of Chemical Physics* 125, 133316 (2006).

Hahkjoon Kim, Kristin S. Dooley, Gerrit C. Groenenboom, and Simon W. North "Vibrational State Dependent Predissociation Dynamics of ClO (A <sup>2</sup>Π<sub>3/2</sub>): Insight from Correlated Fine Structure Branching Ratios" *Physical Chemistry Chemical Physics* 8, 2964 (2006).

Hahkjoon Kim, Kristin S. Dooley, Elizabeth R. Johnson, and Simon W. North, "Photodissociation of the BrO Radical using Velocity Map Ion Imaging : Excited State Dynamics and Accurate D<sub>0</sub>(Br-O) Evaluation " *Journal of Chemical Physics* 124, 134304 (2006).

Hahkjoon Kim, Kristin S. Dooley, Elizabeth R. Johnson, and Simon W. North, "Design and Characterization of a Late-Mixing Flash Pyrolytic Source for Expansion Cooled Radicals " *Review of Scientific Instruments* 76, 124101 (2005).

W.S. Taylor, C.C Matthews, K.S. Parkhill, "Reactions of Cu<sup>+</sup>(<sup>1</sup>S,<sup>3</sup>D) with CH<sub>3</sub>Cl, CH<sub>2</sub>ClF, CHClF<sub>2</sub>, and CClF<sub>3</sub>" *J. Phys. Chem. A*, 109, 356 (2005).

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