

## William Charles DeGraffenreid

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(Updated: July 1, 2011)

### Education

- July 1995 - Sept. 2000                      University of Maryland                      College Park, MD  
Ph.D. in Chemical Physics  
Dissertation: *Cold Collisions in an Optically Brightened Sodium Beam*  
Dissertation Advisor: Prof. John Weiner
- Sept. 1991 - June 1995                      California State Polytechnic University                      Pomona, CA  
B.S. in Physics with a minor in Chemistry  
*Magna Cum Laude*  
Senior Thesis: *The Leidenfrost Effect in a Binary Mixture*

### Experience

- Aug. 2002 – Present                      California State University, Sacramento                      Sacramento, CA  
Department Chair, Aug. 2011 – Present  
Professor of Physics, Aug. 2011 – Present  
Associate Professor of Physics, Aug. 2006 – Aug. 2011  
Assistant Professor of Physics, Aug. 2002 – Aug. 2006  
Associate Director, Center for STEM Excellence, Aug. 2006 – Aug. 2007  
Society of Physics Students, Faculty Advisor, Aug. 2002 – Present
- Jan. 2011 – Aug. 2011                      University of California, Davis                      Davis, CA  
Visiting Scholar, Department of Civil and Environmental Engineering
- June 2003 – June 2009                      Society of Physics Students                      College Park, MD  
National Council Member from Zone 18 (California, Nevada, Hawaii, and Philippines)
- Jan. 2003 – Aug. 2004                      National Institute of Standards and  
Technology                      Gaithersburg, MD  
Guest Researcher, Physics Laboratory
- Sept. 2000 – Aug. 2002                      National Institute of Standards and  
Technology                      Gaithersburg, MD  
NRC Postdoctoral Fellow, Physics Laboratory
- July 1995 – Sept. 2000                      University of Maryland                      College Park, MD  
Research Assistant, Laboratory for AMO Science and Engineering (LAMOSE), May 1996 – Sept. 2000  
Teaching Assistant, Department of Chemistry, Aug. 1995 – May 1996  
Research Assistant, Institute for Physical Science and Technology, July 1995 – Sept. 1995

Sept. 1996 – Dec. 1996  
Visiting Researcher, Institute de Física de São Carlos

Universidade de São Paulo, São Carlos

São Carlos, SP, Brazil

## Grants and Awards

- Jan. 2011 – Aug. 2011      Sabbatical at UC Davis. Development of high sensitivity laser spectroscopy system to characterize the optical properties of aerosols.
- Apr. 2010                      Outstanding University Service Award
- Aug. 2005 – July 2006      Sacramento State Pedagogy Enhancement Award. "Development of an Interdisciplinary Spectroscopy Course." Co-PI with Dr. Susan Crawford, Sacramento State Department of Chemistry. \$11,350 (Six Units Total Release Time + \$800). Award declined due to scheduling issues as Dr. Crawford was elected department chair.
- Aug. 2004 – July 2007      NSF Major Research Instrument Grant (CHE-0420662). "Development and Applications of Aerosol Charge and Aerosol Photoionization Detectors for High Performance Liquid Chromatography." Co-PI with Dr. Roy Dixon, Sacramento State Department of Chemistry. \$205,729
- July 2004 – June 2005      Sacramento State Instructionally Related Activities (IRA) Grant. "Summer Research Experiences for Chemistry and Physics/Astronomy Students." Co-PI with L. Roberts, R. Dixon, S. Crawford, and E. Martinez. \$10,000
- July 2003 – June 2004      Sacramento State Instructionally Related Activities (IRA) Grant. "Summer Research Experiences for Chemistry and Physics/Astronomy Students." Co-PI with L. Roberts, R. Dixon, and S. Crawford. \$10,000
- May 2003                      Paper entitled "Foreign gas broadening and shift of the  $2^2S_{1/2} - 4^2S_{1/2}$  two-photon transition of atomic lithium" chosen as an Institute of Physics Select Publication
- Aug. 1995 - June 1997      University of Maryland Graduate Fellowship
- 1993                              Sigma Pi Sigma National Physics Honor Society

## Professional Organizations

Sigma Pi Sigma ( $\Sigma\Pi\Sigma$ )

Society of Physics Students (SPS)

## Publications - Journal Articles

W. DeGraffenreid, "Teaching Ethics: The Seminar Model," *The CUR Quarterly* **30**, 35 (2010).

W. DeGraffenreid and C. J. Sansonetti. "Coincidence in the two-photon spectra of Li and Li<sub>2</sub> at 735 nm." *J. Phys. B: At. Mol. Opt. Phys.* **38**, 457 (2005).

J. Ramirez-Serrano, W. DeGraffenreid, J. Weiner, E. Tiesinga, and P. S. Julienne. "Beam-loss Spectroscopy of Cold Collisions in a Brightened Sodium Beam." *Phys Rev. A* **69**, 042708 (2004).

W. DeGraffenreid, S. C. Campbell, and C. J. Sansonetti. "Foreign gas broadening and shift of the  $2^2S_{1/2} - 4^2S_{1/2}$  two-photon transition of atomic lithium." *J. Phys. B: At. Mol. Opt. Phys.* **36**, 2099 (2003). (IoP Select Publication)

W. DeGraffenreid and C. J. Sansonetti. " $2^2S_{1/2} - 4^2S_{1/2}$  transition of atomic lithium by Doppler-free two-photon spectroscopy." *Phys. Rev. A* **67**, 012509 (2003).

W. DeGraffenreid and C. J. Sansonetti. "Reference lines in the optogalvanic spectra of uranium and thorium over the wavelength range 694 - 755 nm." *J. Opt. Soc. Am. B* **19**, 1711 (2002).

J. Ramirez-Serrano, W. DeGraffenreid, and J. Weiner. "Polarization-dependent spectra in the photoassociative ionization of cold atoms in a bright sodium beam." *Phys. Rev. A* **65**, 052719 (2002).

W. DeGraffenreid, J. Ramirez-Serrano, Y.-M. Liu, A. Rosenbaum, J. Weiner, and R. Napolitano. "Structure in the Angular Dependence of Optical Suppression of Photoassociative Ionization Collisions within an Optically Cooled and Collimated Sodium Atom Beam." *Appl. Phys. B* **71**, 881-884 (2000).

W. DeGraffenreid, J. Ramirez-Serrano, Y.-M. Liu, and J. Weiner. "A Continuous, Dense, Highly Collimated Sodium Beam." *Rev. Sci. Instrum.* **71**, 3668-3676 (2000).

## **Publications - Other**

W. T. Hill, III and C. H. Lee, "Light-Matter Interaction: Atoms and Molecules in External Fields and Nonlinear Optics," (Wiley, New York, 2007) ISBN: 978-3-527-40661-6. Partially illustrated by William DeGraffenreid.

J. Weiner and P.-T. Ho, "Light-matter interaction, fundamentals, and applications," (Wiley, New York, 2003) ISBN: 0-471-25377-4. Illustrated by William DeGraffenreid.

## **Selected Invited Presentations**

"The LASER at 50: History, Principles, and Chemistry Applications"  
Chemistry and Biochemistry Seminar Series  
California State University, Sacramento  
Sacramento, CA  
October 2010

"Lasers: 50 Years of Solutions Waiting for Problems"  
Science in the River City  
Sacramento, CA  
February 2010

"Scientific Professionalism / Ethics"  
Society of Physics Students Zone 18 Regional Meeting  
San Bernardino, CA  
April 2009

"Scientific Professionalism: A Discussion"  
Physics Colloquium Series  
California State University, Sacramento  
Sacramento, CA  
February 2009

"Professionalism Workshop"  
SPS Zone 16 / Four Corners APS Joint Meeting  
Northern Arizona University  
Flagstaff, AZ  
October 2007

"Teaching Professionalism to Undergraduates"  
Southern California American Association of Physics Teachers / SPS Zone 18 Joint Meeting  
University of Southern California  
Los Angeles, CA  
April 2007

"Structure of lithium: what we looked for, what we found, what we discovered en route, and what we discovered looking back"  
Physics Colloquium Series  
California State Polytechnic University  
Pomona, CA  
April 2006

"Scientific Professionalism / Ethics"  
Society of Physics Students Zone 18 Regional Meeting  
Sacramento, CA  
April 2006

"Structure of lithium: what we looked for, what we found, what we discovered en route, and what we discovered looking back"  
Physics Colloquium Series  
California State University, Fresno  
Fresno, CA  
February 2006

"Doin' it Cheap and Easy: Optogalvanic Frequency References"  
Physics Colloquium Series  
California State University, Sacramento  
Sacramento, CA  
October 2003

"High Precision Laser Spectroscopy at NIST"  
SSU Society of Physics Students Seminar  
Sonoma State University  
Rohnert Park, CA  
October 2001

"High Precision Laser Spectroscopy: Just Like Measuring the Distance Between Union College and Cal Poly Pomona to Five Millimeters!"  
Union College Physics Department Colloquia  
Union College  
Schenectady, NY  
September 2001

"An Optically Brightened Sodium Beam: How To Make It And What To Do With It"  
Laboratory for Atomic, Molecular, and Optical Science and Engineering Seminar Series  
University of Maryland  
College Park, MD  
May 2000

"Cold Collisions in a Cold, Bright Beam"  
Formation of Cold Molecules Workshop  
Les Houches, France  
March 1999

"Laser Cooling: An Apparent Paradox"  
Physics Seminar Series  
California State Polytechnic University  
Pomona, CA  
October 1997

"The Leidenfrost Effect in Binary Systems"  
Physics Seminar Series  
California State Polytechnic University  
Pomona, CA  
May 1995

"The Leidenfrost Effect"  
Society of Physics Students Zone 18 Annual Meeting  
Pomona, CA  
January 1995

## **Selected Contributed Presentations**

"Head direction cell activity recorded during alteration of geomagnetic field polarity"  
Society for Neuroscience Annual Meeting  
San Diego, CA  
November 2010

"Advanced Laboratories at Sacramento State"  
American Physical Society April Meeting  
Saint Louis, MO  
April 2008

"Effects and Use of Spray Electrification in Aerosol Charge Detection for HPLC"  
International Symposium and Exhibit on High-Performance Liquid Phase Separations and Related Techniques  
San Francisco, CA  
June 2006

"Development of an Economical Detector for HPLC Utilizing Spray Electrification"  
CSU Biotechnology Symposium  
San Jose, CA  
January 2006

"Coincidence in the Two-photon Spectra of Li and Li<sub>2</sub>"  
APS – California Section Meeting  
Sacramento, CA  
October 2005

"Teaching Professionalism/Ethics to Undergraduates"  
AAPT National Meeting  
Salt Lake City, UT  
August 2005

"Trials and Tribulations: Laser Spectroscopy of Lithium"  
AAPT National Meeting  
Sacramento, CA  
August 2004

"Laser Spectroscopy of the Lithium Atom: Oops and Redemption"  
Joint Meeting of the Northern California AAPT and APS - California Section  
Berkeley, CA  
November 2003

"Two-photon spectroscopy of low-lying states of lithium"  
DAMOP Annual Meeting  
Williamsburg, VA  
May 2002

"Two-photon spectroscopy of low-lying states of lithium: energy levels, hyperfine structure, and isotope shifts"  
Quantum Electronics and Laser Science Conference (QELS)  
Long Beach, CA  
May 2002

"Optogalvanic reference lines of uranium and thorium over the wavelength range 694 – 755 nm"  
Quantum Electronics and Laser Science Conference (QELS)  
Long Beach, CA  
May 2002

"Two-photon spectroscopy of the 4S state of atomic lithium: energy levels, hyperfine structure, and isotope shifts"  
Sigma Xi Post Doctoral Poster Presentations – NIST Chapter  
Gaithersburg, MD  
February 2002

"Measurement of the 3 <sup>2</sup>S – 2 <sup>2</sup>S transition isotope shift in atomic lithium"  
DAMOP Annual Meeting  
London, Ontario, Canada  
May 2001

"Reference lines in the optogalvanic spectra of uranium and thorium over the wavelength range 694 - 755 nm"  
DAMOP Annual Meeting  
London, Ontario, Canada  
May 2001

"Angular Structure and Quantum Interference in the Optical Suppression of Photo-associative Ionization in a Brightened Sodium Beam"  
DAMOP Annual Meeting  
Storrs, CT  
June 2000

"Structure in the Anisotropy of High-Field Optical Suppression in Photoassociative Ionization Collisions within an Optically Slowed and Collimated Sodium Atom Beam"

OSA Annual Meeting

Santa Clara, CA

September 1999

"Polarization Dependence of Optical Suppression in a Sodium Beam"

International Quantum Electronics Conference (IQEC)

San Francisco, CA

May 1998