

## Daniel Stephen Slaughter

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CONTACT INFORMATION	Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, California 94720 USA	Tel: +1 510 486 4847 Fax: +1 510 486 5494 E-mail: <a href="mailto:DSSlaughter@lbl.gov">DSSlaughter@lbl.gov</a> <a href="http://sites.google.com/site/dsslaughter1980/">http://sites.google.com/site/dsslaughter1980/</a>
RESEARCH INTERESTS IN BRIEF	Investigating the electronic and nuclear dynamics of atoms and molecules following electron impact, photoexcitation and photoionization; Transient states of molecules such as resonant anions and excited vibronic states; Chemical reaction dynamics; Atomic and molecular interactions with electrons and positrons; Multi-parameter particle detection; charged-particle optics design.	
EDUCATION	Flinders University, Adelaide, SA, Australia  PhD (2002-2007) Thesis: "Superelastic Electron Scattering from Caesium" Supervisors: P.J.O. Teubner, M.J. Brunger - thesis available online through the <a href="http://catalogue.flinders.edu.au/local/adt/public/adt-SFU20071009.100421/">Australian Digital Theses Program</a> <a href="http://catalogue.flinders.edu.au/local/adt/public/adt-SFU20071009.100421/">http://catalogue.flinders.edu.au/local/adt/public/adt-SFU20071009.100421/</a>  Flinders University, Adelaide, SA, Australia  BSc (Hons 1st class), Physics, 2001. Thesis: "Caesium Ultranarrow Bandwidth Excited Atomic Line Optical Filter" Supervisors: P.J.O. Teubner, V. Karaganov.	
ACADEMIC AND RESEARCH EXPERIENCE	Lawrence Berkeley National Laboratory, Chemical Sciences Division, Berkeley, CA, USA  <i>Staff Scientist</i> <span style="float: right;"><b>May 2014 - present</b></span> Principal Investigator (PI) for the electron-driven molecular dynamics projects in the Atomic, Molecular and Optical Sciences (AMOS) group of the Chemical Sciences Division, and PI for the Laboratory Directed Research and Development project probing molecular excited state dynamics with multi-color, multi-pulse laser and synchrotron photons. Supervision of graduate students and postdocs and development of safe work practices and safe laboratory environments.  <i>Project Scientist</i> <span style="float: right;"><b>Feb 2013 - May 2014</b></span> Investigation of detailed dynamical description of the dynamics of transient anion resonances for polyatomic molecules and key aspects of the dynamics in larger transient anions of biological significance. Initiating and building collaboration with experiment and theory groups both within and outside LBNL. With co-workers in LBNL Chemical Sciences, initiated a Laboratory Directed Research and Development project to probe molecular excited state dynamics with multi-color, multi-pulse laser and synchrotron photons. Supervision of graduate students and postdocs and development of safe work practices and a safe laboratory environment for the AMOS Experimental group at LBNL.	

*Postdoctoral Research Fellow*

**Apr 2010 - Feb 2013**

Performing experimental investigations of the dynamics of dissociative electron attachment to polyatomic molecules. Developing scientific apparatus to enable momentum imaging of dissociative electron attachment to large molecules. Collaboration with experiment and theory groups both within and outside of LBNL. Supervision of graduate students.

Centre for Antimatter-Matter Studies, Australian National University,  
Canberra, Australia

*Postdoctoral Research Fellow*

**Jan 2008 - Apr 2010**

Design and development of a new apparatus for multi-parameter charged particle detection of reaction products in positron-atom ionising collisions. Detailed measurements of low-energy positron interactions with atoms and molecules, including elastic and total interaction cross sections, positronium formation, direct ionisation cross sections and state-resolved electronic excitation cross sections.

Flinders University, Adelaide, Australia.

*Associate Lecturer*

**2006**

Teaching of undergraduate courses. Primary responsibilities were tutorial preparation and delivery, shared responsibilities for creating exams and other student assessment tasks.

*Postgraduate Student*

**2001 - 2007**

Undergraduate physics tutoring (classes and consulting) and laboratory teaching.

#### RECENT AWARDS

- LBNL Spot Award (2011), *For excellent contribution and team spirit in representing the Chemical Sciences Division at the October 2011 Lab Open House.*

#### COMMUNITY OUTREACH

- Industry Initiatives for Science and Math Education (IISME, 2013), *Hosting and mentoring Alameda High School teacher Rupika Malik during her 6-week internship with the AMO Experimental group at LBNL.*
- Berkeley Lab Open House (2011), *Representing the Chemical Sciences Division.*

#### RECENT INVITED TALKS

- "Momentum Imaging of the Dynamics of Dissociative Electron Attachment to Molecules of Biological Significance", APS Meeting of the Division of Atomic Molecular and Optical Physics (DAMOP), Madison, Wisconsin, USA, June 3, 2014.
- "Exploring Free Electron - Driven Chemistry Using Synchrotron Radiation", Workshop on Current and Future Directions for AMO and Chemical Physics Research, ALS User Meeting, Berkeley, CA, USA, October 8-9, 2013.
- "3-D Momentum Imaging of Dissociative Electron Attachment Dynamics in Polyatomic Molecules", XVIII International Symposium on Electron-Molecule Collisions and Swarms (POSMOL), Kanazawa, Japan, July 19-20, 2013.
- "Low-Energy Free Electron Driven Chemistry in Polyatomic Molecules", Colloquium, Faculty of Science and Engineering, Sophia University, Tokyo, July 2013.

**2013**

20. A. Moradmand, D. S. Slaughter, D. J. Haxton, T. N. Rescigno, C. W. McCurdy, Th. Weber, S. Matsika, A. L. Landers, A. Belkacem, and M. Fogle  
Dissociative electron attachment to carbon dioxide via the  $^2\Pi_u$  shape resonance  
*Phys. Rev. A* **88** 032703
19. A. Moradmand, D. S. Slaughter, A. L. Landers, and M. Fogle  
Dissociative-electron-attachment dynamics near the 8-eV Feshbach resonance of  $\text{CO}_2$   
*Phys. Rev. A* **88** 022711
18. D. S. Slaughter, D. J. Haxton, H. Adaniya, T. Weber, T. N. Rescigno, C. W. McCurdy, and A. Belkacem  
Ion-momentum imaging of resonant dissociative-electron-attachment dynamics in methanol  
*Phys. Rev. A* **87** 052711

**2012**

17. D. S. Slaughter, H. Adaniya, T. N. Rescigno, D. J. Haxton, C. W. McCurdy, A. Belkacem, Å. Larson and A. E. Orel  
Resonant enhanced electron impact dissociation of molecules  
*J. Phys.: Conf. Ser.* **388** 012016
16. H. Adaniya, D. S. Slaughter, T. Osipov, T. Weber, and A. Belkacem  
A momentum imaging microscope for dissociative electron attachment  
*Rev. Sci. Instrum.* **83** 023106

**2011**

15. J. R. Machacek, C. Makochekanwa, A. C. L. Jones, P. Caradonna, D. S. Slaughter, R. P. McEachran, J. P. Sullivan, S. J. Buckman, S. Bellm, B. Lohmann, D. V. Fursa, I. Bray, D. W. Mueller and A. D. Stauffer  
Low-energy positron interactions with xenon  
*New J. Phys.* **13** 125004.
14. D. S. Slaughter, H. Adaniya, T. N. Rescigno, D. J. Haxton, A. E. Orel, C. W. McCurdy and A. Belkacem  
Dissociative electron attachment to carbon dioxide via the 8.2 eV Feshbach resonance  
*J. Phys. B: At. Mol. Opt. Phys.* **44** 205203.
13. D. J. Haxton, H. Adaniya, D. S. Slaughter, B. Rudek, T. Osipov, T. Weber, T. N. Rescigno, C. W. McCurdy, and A. Belkacem

- Observation of the dynamics leading to a conical intersection in dissociative electron attachment to water  
*Phys. Rev. A* **84** 030701(R)
12. C. Makochekanwa, J. R. Machacek, A. C. L. Jones, P. Caradonna, D. S. Slaughter, R. P. McEachran, J. P. Sullivan, and S. J. Buckman, S. Bellm and B. Lohmann, D. V. Fursa and I. Bray, D. W. Mueller, A. D. Stauffer, M. Hoshino  
 Low-energy positron interactions with krypton  
*Phys. Rev. A* **83** 032721
11. A. C. L. Jones, C. Makochekanwa, P. Caradonna, D. S. Slaughter, J. R. Machacek, R. P. McEachran, J. P. Sullivan, S. J. Buckman, A. D. Stauffer, I. Bray and D. V. Fursa  
 Positron scattering from neon and argon  
*Phys. Rev. A* **83** 032701
10. J. P. Sullivan, C. Makochekanwa, A. Jones, P. Caradonna, D. S. Slaughter, J. Machacek, R. P. McEachran, D. W. Mueller, and S. J. Buckman  
 Forward angle scattering effects in the measurement of total cross sections for positron scattering  
*J. Phys. B: At. Mol. Opt. Phys.* **44** 035201
9. T. Pflger, M. Holzwarth, A. Senftleben, X. Ren, A. Dorn, J. Ullrich, L. R. Hargreaves, B. Lohmann, D. S. Slaughter, J. P. Sullivan, J. C. Lower, and S. J. Buckman  
 Kinematically complete experiments for positron-impact ionization of helium atoms at the NEPOMUC facility  
*J. Phys.: Conf. Ser.* **262** 012047
- 2010**
8. A. C. L. Jones, P. Caradonna, C. Makochekanwa, D. S. Slaughter, R. P. McEachran, J. R. Machacek, J. P. Sullivan, and S. J. Buckman (2010).  
 Observation of Threshold Effects in Positron Scattering from the Noble Gases,  
*Phys. Rev. Lett.* **105** 073201.
- 2009**
7. Casten Makochekanwa, Ana Bankovic, Wade Tattersall, Adric Jones, Peter Caradonna, Daniel Slaughter, Kate Nixon, Michael J Brunger, Zoran Lj Petrovic, James P Sullivan and Stephen J Buckman (2009).  
 Total and positronium formation cross sections for positron scattering from H<sub>2</sub>O and HCOOH,  
*New J. Phys.* **11** 103036.
6. Peter Caradonna, James P. Sullivan, Adric Jones, Casten Makochekanwa, Daniel Slaughter, Dennis W. Mueller and Stephen J. Buckman (2009).  
 Excitation of the n=2 States of Helium by Positron Impact,  
*Phys. Rev. A* **80** 060701.

5. P. Caradonna, A. Jones, C. Makochekanwa, D. S. Slaughter, J. P. Sullivan, S. J. Buckman, I. Bray and D. V. Fursa (2009).  
High Resolution Positron Scattering from Helium: Grand Total and Positronium Formation Cross Sections,  
*Phys. Rev. A* **80** 032710.
4. A. Jones, P. Caradonna C. Makochekanwa, D. Slaughter, D. Mueller, J. P. Sullivan and S. J. Buckman (2009).  
High Resolution Positron Interactions,  
*J. Phys.: Conf. Proc.* **194**012033.
3. J. P. Sullivan, S. J. Buckman, A. Jones, P. Caradonna, C. Makochekanwa, D. Slaughter, Z. Lj Petrovic, A. Bankovic, S. Dujko, J. P. Marler, R. D. White (2009).  
Low energy positron interactions - trapping, transport and scattering,  
*J. Phys.: Conf. Ser.* **162** 012002.

### 2008

2. S.J Buckman, T. Maddern, J. Francis-Staite, L. Hargreaves, M.J. Brunger, G. Garcia, J.C. Lower, S. Mondal, J.P. Sullivan, A. Jones, P. Caradonna, D. Slaughter, C. Mackochekanwa and R.P. McEachran (2008).  
Low energy lepton scattering: recent results for electron and positron interactions,  
*J. Phys.: Conf. Ser.* **133** 12001.

### 2007

1. D.S. Slaughter, V. Karaganov, M.J. Brunger, P.J.O. Teubner, I. Bray and K. Bartschat (2007).  
Superelastic electron scattering from laser-excited cesium atoms,  
*Phys. Rev. A* **75** (6) 2717.