

JASON A. YOUNG, PH. D.

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Research Interests

- Measurements of electron impact induced excitation, ionization, dissociation, and emission from molecules and atoms relevant to planetary atmospheres
- Production and manipulation of particle beams for novel spectroscopic measurements, e.g., positrons, photons, atomic species, metastables, and radicals
- Positron scattering and attachment processes

Educational Background

- *Ph.D., Physics*, October 2007, University of California, San Diego, La Jolla, CA
- *B.Sc.(honors), Physics*, May 2001, Brown University, Providence, RI

Research Experience

- *Caltech Postdoctoral Scholar* (2008-present.)
Studies of electron impact excitation of various molecules of atmospheric significance via electron energy loss spectroscopy and high resolution UV photon emission.
Principal Investigator, Paul V. Johnson, Jet Propulsion Laboratory.
- *Postdoctoral Researcher*. (2007-2008)
ALS Synchrotron studies at Lawrence Berkeley National Lab including: time-of-flight non-dipole photoemission from sublimated chiral molecules; partial ion yields of atomic and molecular chlorine following K-shell excitation.
Principal Investigator, Professor D. W. Lindle, Department of Chemistry, University of Nevada, Las Vegas.
- *Doctoral student*. (2002-2007)
Study of positron-molecule bound states and resonances via energy-resolved positron annihilation on molecules.
Advisor, Professor C. M. Surko, Department of Physics, University of California, San Diego, La Jolla, CA.
- *Honors undergraduate thesis*. (2000-2001)
Computation of glueball masses for Large N QCD using an adaptation of the Malcedena duality.
Advisor, Professor David Lowe, Department of Physics, Brown University, Providence, RI.
- *Summer student researcher*. (1999) part-time
Assisted development of a controlled single sonoluminescence apparatus.
Advisor, Haruo Kojima, Department of Physics, Rutgers University, New Brunswick, NJ.
- *Summer student researcher*. (1999) part-time
Etalon FSR diagnostics; miscellaneous astronomical data processing.
Advisors, Carlton Pryor and Ted Williams, Department of Physics, Rutgers University, New Brunswick, NJ.

Teaching Experience

- *Laboratory Supervisor/Lecturer*. (University of California, San Diego Winter 2004)
Introductory Physics Labs for Non-physicists, Modern Physics
- *Laboratory Supervisor/Lecturer*. (University of California, San Diego Spring 2004)
Introductory Physics Labs for Non-physicists, Modern Physics
- *Laboratory Supervisor/Lecturer*. (University of California, San Diego Winter 2003)
Introductory Physics Labs for Non-physicists, Electromagnetism and Thermodynamics
- *Teaching assistant* for C. M. Surko (University of California, San Diego 2003)
Introductory Physics for Engineers: Waves and Thermodynamics
- *Teaching assistant*. for C. M. Surko (University of California, San Diego 2003)
Introductory Physics for Physicists: Waves and Thermodynamics

- *Laboratory Supervisor/Lecturer.* (University of California, San Diego Winter 2002)
Introductory Physics Labs for Non-physicists, Mechanics.
- *Laboratory Supervisor/Lecturer.* (University of California, San Diego Fall 2002)
Introductory Physics Labs for Non-physicists, Mechanics.
- *Laboratory Supervisor/Lecturer.* (University of California, San Diego Spring 2002)
Introductory Physics Labs for Non-physicists, Mechanics.

Awards and Fellowships

Caltech Postdoctoral Scholar (California Institute of Technology, 2008)
 Summer Research Fellowship (University of California, San Diego, 2002)
 Regents Fellowship Stipend (University of California, San Diego, 2001-2002)
 UTRA Fellowship (Brown University, 2000)
 NSF Summer Stipend (Rutgers University, 1999)

Professional Memberships

America Physical Society
 Sigma Xi, The Scientific Research Society
 American Association for the Advancement of Science

Publications

- J. A. Young**, C. P. Malone, P. V. Johnson, J. M. Ajello, X. Liu, and I. Kanik, “Electron Impact Induced Emission Cross Sections of the Lyman-Birge-Hopfield Band System in N_2 ($a^1\Pi_g \rightarrow X^1\Sigma$),” submitted to *J. Phys. B*.
- W. C. Stolte, R. Guillemin, I. N. Demchenko, G. Ohrwall, S.-W. Yu, **J. A. Young**, M. Taupin, O. A. Hemmers, M. N. Piancastelli, and D. W. Lindle, “Inner-shell Photofragmentation of Cl_2 ” to be submitted to *J. Phys. B*.
- G. F. Gribakin, **J. A. Young**, and C. M. Surko, “Attachment and annihilation in positron-molecule collisions.” *Rev. Mod. Phys.* in press (2010).
- P. V. Johnson, **J. A. Young**, C. P. Malone, M. A. Khakoo, X. Liu, and I. Kanik, “Electron impact processes in atmospheres of the outer solar system” *J. Phys: Conf. Ser.* **204**, 012003 (2009).
- C. P. Malone, P. V. Johnson, **J. A. Young**, I. Kanik, B. Ajdari and M. A. Khakoo “Electron impact excitation cross sections of N_2 ” *J. Phys: Conf. Ser.* **194**, 052020 (2009).
- C. P. Malone, P. V. Johnson, **J. A. Young**, I. Kanik, B. Ajdari, and M. A. Khakoo, “Integral Cross Sections for the Electron Impact Excitation of the $C^3\Pi_u$, $E^3\Sigma$, and $a^1\Sigma$ States,” *J. Phys. B*, **42**, 225202 (2009).
- J. R. Danielson, **J. A. Young** and C. M. Surko, “Dependence of positron–molecule binding energies on molecular properties.” *J Phys. B.* **42**, 235203 (2009).
- J. A. Young**, C P Malone, P V Johnson, X Liu, J. M. Ajello, and I Kanik, “Dissociative Excitation of NO_2 by Electron Impact.” *J. Phys B*, **42** 185201 (2009)
- J. A. Young**, and C. M. Surko, “Feshbach-resonance-mediated positron annihilation in small molecules.” *Phys. Rev. A*, **78**, 032702 (2008).
- J. A. Young**, G. F. Gribakin, and C. M. Surko, “Role of combination vibrations in resonant positron annihilation.” *Phys. Rev. A*, **77**, 060702(R) (2008).
- J. A. Young**, and C. M. Surko, “Feshbach-resonance mediated annihilation in positron interactions with large molecules,” *Phys. Rev. A*, **77**, 052704 (2008).
- J. A. Young** and C. M. Surko, “Dependence of resonant positron-molecule annihilation on molecular temperature,” *Nucl. Instrum. and Meth. B*, **266**, 478-482 (2008).
- J. A. Young** and C. M. Surko, “Role of binding energy in Feshbach-resonant positron-molecule annihilation,” *Phys. Rev. Lett.* **99**, 133201 (2007).
- L. D. Barnes, **J. A. Young**, and C. M. Surko, “Energy-resolved Positron Annihilation Rates for Molecules,” *Phys. Rev. A* **74**, 012706 (2006).
- J. A. Young** and C. M. Surko, “Charged Particle Motion in Spatially Varying Electric and Magnetic Fields,” *Nucl. Instrum. and Meth. B*, **247**, 147 - 154 (2006).
- J. P. Marler, L. D. Barnes, S. J. Gilbert, J. P. Sullivan, **J. A. Young**, and C. M. Surko, “Experimental Studies of the Interaction of Low-energy Positrons with Atoms and Molecules,” *Nuclear Instrum. and Meth. B*, **221**, 84-92 (2004).

Invited Talks

- J. A. Young, "Electron Impact Measurements of Molecular Nitrogen." 6th Annual General Meeting of the Asia Oceania Geosciences Society, Suntec, Singapore, Aug 11-15, 2009.
- J. A. Young, "Experimental studies of positron annihilation and attachment to molecules." XVIth International Workshop on Positron and Positronium Physics, Toronto, Canada, July 29 – Aug. 1, 2009.
- J. A. Young, "Bound States and Feshbach Resonances in Positron-Molecule Annihilation." 39th Meeting of the Division of Atomic, Molecular, and Optical Physics. State College PA, May 2008.
- J. A. Young, "Resonant Positron-molecule annihilation – Distinguishing Binding and Mode Effects." XXVth International Conference on Photonic, Electronic and Atomic Collisions. Freiburg, Germany, July 2007.
- J. A. Young, "New results on positron-molecule annihilation, vibrational Feshbach resonances and bound states." XIIIth International Workshop on Positron and Positronium Physics, Campinas Brasil, July 27 - 30, 2005.

Contributed Talks

- J. A. Young and C. M. Surko. "Resonances in positron-molecule annihilation" **Student Award Finalist**, 59th Annual Gaseous Electronics Conference. Columbus, OH. October 12, 2006.
- J. A. Young and C. M. Surko. "Positron-molecule annihilation, Feshbach resonances and bound states" 58th Annual Gaseous Electronics Conference. San Jose, CA. October 19, 2005.

Poster Presentations

- J. A. Young, C P Malone, P V Johnson, X Liu, B Ajdari, M A Khakoo, I Kanik, "Electron-impact induced excitation of Lyman-Birge-Hopfield emissions for N₂" AGU Fall Meeting, San Francisco, CA. Dec 18 2009.
- J. A. Young, C P Malone, P V Johnson, X Liu, J. M. Ajello, and I Kanik, "VUV Emissions due to Electron Impact Dissociative Excitation of NO₂" JPL Postdoc Research Day. Pasadena, CA. September 1, 2009.
- J. A. Young and C. M. Surko. "Positron-molecule binding energies measured via resonances in annihilation" 61st Annual Gaseous Electronics Conference. Dallas, TX. October 14, 2008.
- J. A. Young and C. M. Surko. "Dependence of resonant positron-molecule annihilation on molecular size." XIXth International Workshop on Positron and Positronium Physics. Reading, UK, August 2-4, 2007.
- J. A. Young, "Vibrational Feshbach resonances in resonant positron-molecule annihilation." XXVth International Conference on Photonic, Electronic and Atomic Collisions. Freiburg, Germany, July 2007.
- J. A. Young and C. M. Surko. "Resonant positron annihilation in rings and substituted alkanes." DAMOP 2007, Calgary, Alberta, Canada, June 2007.
- J. A. Young, L. D. Barnes, and C. M. Surko. "Non-resonant positron-on-molecule annihilation." DAMOP 2006, Knoxville TN, May 16-20, 2006.
- J. A. Young, L. D. Barnes, and C. M. Surko. "New results for positron-molecule Feshbach resonances and bound states." XXIVth International Conference on Photonic, Electronic, and Atomic Collisions (ICPEAC), Rosario Argentina, July 20-26, 2005.
- J. A. Young, L. D. Barnes, and C. M. Surko. "New results for positron-molecule Feshbach resonances and bound states." DAMOP 2005, Lincoln NE, May 17-21, 2005.
- L. D. Barnes, J. A. Young, and C. M. Surko. "Energy-resolved positron annihilation: the structure of positron-molecule complexes." DAMOP 2004, Tuscan AZ, May 28, 2004.