

Janine Shertzer (JS)

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I. Education

Brown University, Providence RI, M.S. and Ph.D., Physics (1979-84)
Georgetown University, Washington, DC, University Fellow, Physics (1978-79)
Loyola College, Baltimore MD, B.S. Physics and English, magna cum laude (1974-78)

II. Teaching and Research Positions

College of the Holy Cross, Worcester MA
Distinguished Professor of Science (2010-present); Marlon Professor in the Sciences (2004-09); Professor of Physics (2001-04); Associate Professor (1990-2001); Assistant Professor (1984-90)

Institute for Theoretical Atomic and Molecular Physics (ITAMP)
Harvard-Smithsonian Center for Astrophysics, Cambridge MA
Visiting Scientist (2019-20, 2012-13, 2005-06, 1997-98, 1990-91)

Brown University, Providence RI
Visiting Scientist (1988-89); Instructor, Biomedical Summer School (1984)

III. Professional Membership and Service

Member: American Physical Society (APS), Division of Atomic, Molecular and Optical Physics (DAMOP), Topical Group on Few Body Systems (GFB)

Referee: Physical Review Letters (PRL), Physical Review A (PRA), Physica Scripta, Physics Letters A, Journal of Physics B (JPB), American Journal of Physics (AJP), Atoms

APS GFB Nominating Committee (2018)
APS GFB Fellowship Committee (2015-16)
DAMOP Chair of plenary session for Outstanding Doctoral Thesis Prize (2007)
National Science Foundation (NSF) Grant Review Panel for Atomic Theory (2007)
APS Division of Computation Physics (DCOMP) Fellowship Committee (2006)
NSF Division of Physics, Committee of Visitors (2006)
DAMOP Thesis Prize Committee (2005-07); Chair (2006-07)
Search Committee for PRA Editor (2005-06)
PRA Editorial Board (1998-2003)
APS DAMOP Nominating Committee (1997-99)
APS FBG Executive Committee (1993-95)
APS DAMOP Nominating Committee (1997-99)
APS Society of Physics Students, New England Councilor (1987-88)

IV. Major College Service

Committee on Distinguished Fellowships and Graduate Studies (2020-2022)
Academic Standing Committee (2020-2022)
Ad hoc Committee on Governance (2015-16)
Curriculum Committee (2013-15)
Mission and Identity Committee (2013-14, 2007-08)
Committee on Tenure and Promotion (2008-10, 1994-96)
Academic Affairs Council (2006-08); Recorder (2006-07); Vice Chair (2007-08)
Chair, Department of Physics (1998-2004; 1995)
Educational Policy Committee (1991-93)
Academic Standing Committee (1997-90; 2020-22); Chair (1989-90)

V. Grants and Awards

Distinguished Teacher of the Year Award, College of the Holy Cross (2015)
NSF Noyce grant, co-PIs D. Bukatko, B. Bell, D. Bitran, and C. Roberts [\$900,000] (2009-14)
Outstanding Referee for the Journals of the American Physical Society (2008)
APS Fellow: *For her ground breaking introduction of novel finite-element techniques in calculations of bound state and scattering properties of atomic and molecular systems* (2006)
NSF Collaborative Research Grant; co-PI S. Ward, University of North Texas [\$181,000] (2004-07)
Arthur J. O’Leary Award for Teaching and Research (2003)
Sherman-Fairchild Foundation Grant; co-PI R. Garvey [\$230,000] (1996-2001)
NSF Faculty Award for Women [\$250,000] (1991-96)
Cornell Theory Center, NSF Supercomputer Facility [1000 service units] (1989-98)
Batchelor Ford Fellowship (1988-89)
Research Corporation Cottrell College Science Grant [\$8,000] (1987)
Mary Louise Marfuggi Award for Research (1987)
Sigma Xi, Brown University (1984)
Physics Medal and Carrell English Medal, Loyola College (1978)
Who’s Who among Students in American Universities and Colleges (1978)
Alpha Sigma Nu, National Jesuit Honor Society (1977)
Sigma Pi Sigma, National Physics Honor Society (1977)

VI. Publications

55. Ultralong-range Rydberg bi-molecules, Rosario Gonzalez-Ferez, JS, and H. R. Sadeghpour, *Phys. Rev. Letts.* **126**, 043401 (2021)
54. 1D potential wells of the form $V(|x| < a) = -V_0 \left(1 - \frac{|x|^n}{a^n}\right)$, Abby Corrigan and JS, *Eur. J. of Phys.* **42**, 035404 (2021).
53. Solution of the 3D logarithmic Schrodinger equation with a central potential, JS and T.C. Scott, *J. of Phys. Comm.* **4**, 065004 (2020).
52. Solution of the logarithmic Schrödinger equation with a Coulomb potential, T.C. Scott and JS, *J. of Phys. Comm.* **2**, 071504 (2018).
51. Quantum scattering from cylindrical barriers, Sean McAlinden and JS, *AJP* **84**, 764 (2016).
50. Electron scattering from excited states of hydrogen: implications for the ionization threshold law, A. Temkin and JS, *PRA* **87**, 052718 (2013).
49. Long-lived positronium and AGN jets, John T. Giblin. and JS, *ISRN* 848476 (2012).
48. Hyperspherical hidden crossing method applied to Ps(1s)-formation in low energy e^+ -H, e^+ -Li and e^+ -Na collisions, S.J. Ward and JS, *New J. of Physics* **14**, 14025003 (2011).
47. Binding energy and structure of e^+ Na, JS and S.J. Ward, *PRA*. **81**, 064505 (2010).
46. Absolute cross section for positron impact ionization of hydrogen near threshold, Krista Jansen, S.J. Ward, JS, and J.H. Macek, *PRA* **79**,022704 (2009).
45. Finite element solution of Laplace’s equation for ion-atom chambers, Jacob Golde, JS, and Paul Oxley, *AJP* **77**, 81 (2009); reprinted in *Virtual J. of Ultrafast Sci.* **8**, (2009).
44. Near-threshold positron impact ionization of hydrogen, S.J. Ward, Krista Jansen, JS , and J.H. Macek, *NIMB* **266**, 410 (2008).
43. Optimizing the paths for including the correction term to the hyperspherical hidden crossing method: application to Ps formation in e^+ Li collisions, S. Ward, JS, S.Y. Ovchinnikov, and J.H. Macek, *PRA* **75**, 012713 (2007).
42. Application of the Finite Element Method in Atomic and Molecular Physics, JS, *NASA Science Symposium on Atomic and Molecular Physics*, ed. Anand .K. Bhatia, Goddard Space Flight Center, NASA (2007).
41. Direct calculation of the scattering amplitude without partial wave analysis III: Inclusion of correlation effects, JS and A. Temkin, *PRA* **74**, 052701 (2006).
40. Quantum calculation of cold-atom diffraction using periodic magnetic fields, Yin Hung, Bradley Schuller, John Giblin and JS, *PRA* **73**, 062722 (2006).
39. Binding energy and structure of e^+ Li and e^- Li with a parametric model potential, JS and S.J. Ward, *PRA* **73**, 022504 (2006).
38. Positronium formation cross section for positron-lithium collisions, S.J. Ward and JS, *NIMB* **241**, 257 (2005).

37. Effect of the core polarization term on Ps formation in low-energy e^+ -Li collisions, S.J. Ward and JS, NIMB **221**, 206 (2004).
36. Calculation of the full scattering amplitude without partial wave decomposition II: Inclusion of exchange, JS and A. Temkin, PRA **70**, 042710 (2004).
35. Application of the hyperspherical hidden crossing method to positronium formation in positron-lithium scattering, S. Ward and JS, PRA **68**, 032720 (2003).
34. Long-lived states of positronium in crossed electric and magnetic fields, JS, J. Ackermann and P. Schmelcher, NIMB **192**, 128 (2002).
33. Direct calculation of the scattering amplitude without partial wave analysis, JS and A. Temkin, PRA **63**, 062714 (2001).
32. Extension of the Temkin-Poet model to $L>0$ partial waves: the generalized exchange approximation, A. Temkin, JS, and A. Bhatia, PRA. **57**, 1091 (1998).
31. Stabilization of matter-antimatter atoms in crossed electric and magnetic fields, P. Schmelcher, J. Ackermann and JS, NIMB, **143**, 202 (1998).
30. Nonadiabatic dipole polarizabilities of H_2^+ and D_2^+ ground states, JS and Chris H. Greene, PRA **58**,1082 (1998).
29. Positronium in crossed electric and magnetic fields: the existence of a long-lived ground state, JS J. Ackermann and P. Schmelcher, PRA **58**, 1129 (1998).
28. Long-lived states of positronium in crossed electric and magnetic fields, J. Ackermann, JS, and P. Schmelcher, PRL **78**, 199 (1997).
27. Two-electron atoms in superintense radiation fields: Dichotomy and stabilization, M. Gavrilu and JS, PRA **53**, 3431 (1996).
26. Finite element calculations for the three-body Coulomb problem with two equal masses, J. Ackermann and JS, PRA **54**, 365 (1996).
25. Finite element analysis of electron-hydrogen scattering, JS and J. Botero, PRA **49**, 3673 (1994).
24. H_2^+ in superintense laser fields: Alignment and spectral restructuring, JS, A. Chandler, and M. Gavrilu, PRL **73**, 2039 (1994).
23. Hyperspherical approach to Coulombic three-body systems with different masses, Y. Zhou, C.D. Lin and JS, JPB **26**, 3937 (1993).
22. Accurate finite element solution of the two-body Dirac equation, T.C. Scott, JS and R.A. Moore, PRA **45**, 4395 (1992).
21. Accurate non-relativistic expectation values for H_2^+ , J.F. Babb and JS, CPL **189**, 287 (1992).
20. Direct numerical solution of the Schrödinger equation for quantum scattering problems, J. Botero and JS, PRA **46**, R1155 (1992).
19. Solution of three-body Coulomb problems for $J=0$, JS and F.S. Levin, PRA **43**, 2531 (1991).
18. Evaluation of matrix elements $\langle n, l | r^\beta | n, l' \rangle$ for arbitrary β , JS, PRA **44**, 2832 (1991).
17. The finite element method for energy eigenvalues of quantum mechanical systems, L.R. Ram-Mohan, S. Saigal, D. Dossa and JS, Comput. in Phys. **4**, 50 (1990).
16. Removal of accidental degeneracies in semiconductor quantum wires, JS and L.R. Ram-Mohan, PRB **41**, 9994 (1990).
15. Electronic energy bands and optical nonlinearity of checker-board superlattices, L.R. Ram-Mohan and JS, APL **57**, 282 (1990).
14. The spectrum of photoexcited Nd^{3+} ions in $LaCl_3$, N. Pelletier-Allard, R. Pelletier, and JS, JCP **93**, 14 (1990).
13. Finite element calculation of low-lying states of hydrogen in a superstrong magnetic field, JS, L.R. Ram-Mohan and D. Dossa, PRA **40**, 4777 (1989).
12. Finite element analysis of hydrogen in superstrong magnetic fields, JS, PRA **39**, 3833 (1989).
11. Solution of the radial equation for hydrogen by the Laplace transform method, JS, IJEMST **19**, 681 (1988).
10. On the stability of the Skyrme model soliton with unit Hopf Charge, Z. Hlousek and JS, PRD **37**, 1279 (1988).
9. Optical spectra and energy level analysis of $Dy^{3+}:LaCl_3$, R.S. Rana, JS, F.W. Kaseta, R. Garvey, D. Rana and S.Y. Feng, J. Chem. Phys. **88**, 2242 (1988).
8. Optical spectra and energy level analysis of $Pr^{3+}:GdCl_3$, R.S. Rana, JS, and F.W. Kaseta, Lanth. and Act. Res. **2**, 295 (1988).
7. Finite element analysis of low energy e^+ -H scattering, F.S. Levin and JS, PRL **61**,1089 (1988).
6. Boundary conditions and channel coupling array calculation for the H_2 ungerade triplet state, JS, E. Bernstein and F.S. Levin, PRA **31**, 3570 (1985).
5. Channel coupling array analysis of the electron correlation in H_3^+ , F.S. Levin and JS, PRA **32**, 2062 (1985).

4. Finite element solution of the Schrödinger equation for the helium ground state, F.S. Levin and JS, PRA **32**, 3285 (1985).
3. Channel coupling array calculations of the H_3^+ Ground State, F.S. Levin and JS, *Few Body Problems in Physics*, ed. B. Zeitnitz (North-Holland, Amsterdam, 1984), Vol. II, p. 713.
2. Channel coupling array calculations of H_2 ungerade states, JS, E. Bernstein and F.S. Levin, *Few Body Problems in Physics*, ed. B. Zeitnitz (North-Holland, Amsterdam, 1984), Vol. II, p. 715.
1. Channel coupling theory of molecular structure: explanation and elimination of unphysical results, W.K. Ford, JS and F.S. Levin, CPL **96**, 223 (1983).

VII. Meeting Presentations/Published abstracts

56. Nonadiabatic dipole polarizability of H_2^+ and D_2^+ (*invited talk*) JS and Chris Greene, AMO Physics according to Chris Greene – 60th birthday conference (Keystone, CO 2015).
55. Electron scattering from excited states of H: derivation of the ionization threshold law, A. Temkin and JS, DAMOP (Quebec City, Quebec 2013).
54. Scattering properties of three ultracold atoms in a cylindrical waveguide geometry, Doerte Blume and JS, DAMOP (Quebec City, Quebec 2013).
53. Hyperspherical hidden crossing calculation of Ps formation in low-energy e^+ -Na collisions, S.J. Ward and JS, DAMOP (Atlanta, GA 2011).
52. Binding energy and structure of e^+ Na, JS and S.J. Ward, DAMOP (Houston, TX 2010).
51. Big computing at a small school: how to beg, borrow or steal CPU (*invited talk*), JS, High performance computing at liberal arts colleges workshop (Union College, Schenectady, NY 2009).
50. Hyperspherical hidden crossing calculation of the absolute cross section for positron-impact ionization of hydrogen near threshold, S.J. Ward, Krista Jansen, JS and J.H. Macek, LEPPP (Toronto, Canada 2009).
49. Binding energy calculations for e^- Na and e^+ Na, JS and S.J. Ward, DAMOP (Charlottesville, VA 2009).
48. High accuracy potential calculations for atom-ion chamber, JS, Jacob Golde, and Paul Oxley, DAMOP (Charlottesville, VA 2009).
47. Absolute cross section for positron impact ionization of hydrogen near threshold, S.J. Ward, Krista Jansen, JS and J.H. Macek, DAMOP (State College, PA 2008)
46. Optimizing the paths for including the correction term to the hyperspherical hidden crossing method: application to Ps formation in e^+ -Li collisions, S.J. Ward, JS, J.H. Macek and S. Ovchinnikov, LEPP (Reading, Eng. 2007).
45. Near threshold positron impact ionization of atomic hydrogen, S.J. Ward, Krista Jansen, JS, J.H. Macek, S. Yu Ovchinnikov, LEPPP (Reading, England 2007).
44. Near threshold positron impact ionization of hydrogen, Krista Jansen, S.J. Ward, JS and J.H. Macek, DAMOP (Calgary, Canada 2007).
43. Optimizing the paths for including the correction term to the hyperspherical hidden crossing method: application to Ps formation in e^+ Li collisions, S.J. Ward, JS, S. Ovchinnikov and J.H. Macek, CAARI (Fort Worth, 2006).
42. Binding energy of e^+ Li using the Peach model potential, JS and S. Ward, DAMOP (Knoxville, TN 2006).
41. Applications of the finite element method to atomic and molecular physics (*invited talk*), JS, Temkin-Drachman retirement symposium, NASA (Greenbelt, MD 2006).
40. Hyperspherical hidden crossing calculation of Ps-formation cross section for low energy e^+ -Li collisions, JS and S. Ward, DAMOP (Lincoln, NE 2005).
39. Higher order corrections to the Wannier threshold law for positron scattering, J. Sternberg, S. Ward, J.H. Macek, and JS, DAMOP (Tucson, AR 2004).
38. Application of the hyperspherical hidden crossing method to positron collisions, S.J. Ward and JS, CAARI (Denton, TX 2004).
37. Calculation of the full scattering amplitude without partial wave decomposition II: Inclusion of exchange, JS and A. Temkin, DAMOP (Boulder, CO 2003).
36. Calculation of the full scattering amplitude without partial wave decomposition II: Inclusion of exchange, JS and A. Temkin, ICPEAC (Stockholm, Sweden 2003).
35. The application of the hyperspherical hidden crossing method to positronium formation in positron-lithium scattering, S. Ward and JS, DAMOP (Boulder, CO 2003).
34. Hyperspherical hidden crossing calculation of positron-lithium collisions, S.J. Ward and JS, DAMOP (Williamsburg, VA 2002).
33. Calculation of scattering amplitude without partial wave analysis: Inclusion of exchange, JS and A. Temkin,

- DAMOP (Williamsburg, VA 2002).
32. Direct calculation of the scattering amplitude without partial wave analysis, JS and A. Temkin, DAMOP (London ON, 2001).
 31. Direct calculation of the scattering amplitude without partial wave analysis, JS and A. Temkin, ICPEAC (Santa Fe, NM 2001).
 30. Long-lived states of positronium in crossed electric and magnetic fields (*invited talk*), LEPPP (Santa Fe, NM 2001).
 29. Long-lived states of positronium in crossed electric and magnetic Fields (*invited talk*), ITAMP workshop on wave functions and QED effects in few-electron atoms, (Cambridge, MA 2000).
 28. Nonadiabatic calculation of the dipole polarizability of H_2^+ , JS and Chris H. Greene, DAMOP (Santa Fe, NM 1998).
 27. Inelastic scattering in the GEA, A. Temkin, JS and A.K. Bhatia, DAMOP (Santa Fe, NM 1998).
 26. Long-lived states of positronium in crossed electric and magnetic fields, JS, J. Ackermann, and P. Schmelcher, DAMOP (Washington DC, 1997).
 25. Adaptive finite element calculations for the three-body Coulomb problem, JS and J. Ackermann, DAMOP (Ann Arbor, MI 1996).
 24. Finite element analysis of electron-hydrogen scattering (*invited talk*), JS, ITAMP workshop on new developments in electron-atom scattering, (Cambridge, MA 1996).
 23. Alignment and spectral restructuring of H_2^+ in superintense laser field, JS, A. Chandler, and M. Gavril, DAMOP (Toronto, ON 1995).
 22. The hydrogen molecular ion in high-frequency, superintense fields (*invited talk*), JS, ITAMP workshop on strong perturbations of atomic and molecular rydberg states, (Cambridge, MA 1995).
 21. H_2^+ in superintense laser fields, JS, A. Chandler, and M. Gavril, APS (Washington DC 1994).
 20. Finite element analysis of two-electron systems (*invited talk*), JS, APS (Washington, DC 1993).
 19. Theoretical estimates of the 1^1S and 2^1S Lamb shifts in helium, J.D. Baker, R.C. Forrey, J.D. Morgan III, R.N. Hill, M. Jeziorska, and JS, DAMOP (Reno, NV 1993).
 18. Finite element analysis of electron-hydrogen scattering, JS and J. Botero, DAMOP (Reno, NV 1993).
 17. Finite element methods and applications (*invited talk*), JS, DCOMP (Albuquerque, NM 1993).
 16. Finite element analysis of two-electron systems (*invited talk*), JS, Gordon conference on dynamics of simple systems in chemistry and physics, (Andover, NH 1993).
 15. High precision values of the QED corrections for the 1^1S and 2^1S states of helium, J.D. Baker, R.C. Forrey, M.D. Morgan III, R.N. Hill, M. Jeziorska, and JS, APS (Washington DC, 1992).
 14. High precision calculation of QED corrections of the 1^1S and 2^1S states of helium, J.D. Morgan III, J.D. Baker, R.C. Forrey, R.N. Hill, M. Jeziorska, and JS, DAMOP (Chicago, IL 1992).
 13. The application of the finite-element method to electron-diatomic ion collisions, W.M. Huo, C.A. Weatherford, and JS, DAMOP (Chicago, IL 1992).
 12. Extension of the finite element method to three dimensional electron molecule scattering, W.M. Huo, C.A. Weatherford, and JS, DAMOP (Chicago, IL 1992).
 11. Numerical solution of the Schrödinger equation for quantum scattering problems, JS and J. Botero, DAMOP (Chicago, IL 1992).
 10. Finite element analysis of two-electron systems (*invited talk*), JS, JILA Workshop on New Developments in Two Electron Atoms and Ions, (Boulder, CO 1992).
 9. Finite element analysis of few-body systems (*invited talk*), JS, APS (Washington, DC 1991).
 8. High-precision calculation of the Bethe logarithm contribution to QED corrections to helium atom energy levels, J.D. Morgan III, J.D. Baker, R.N. Hill, M. Jeziorska, and JS, APS (Washington DC, 1991).
 7. Solution of the static relativistic two-body problem, T.C. Scott and JS, APS (Washington DC, 1991).
 6. Solution of the 3-body Coulomb problem using finite elements, JS and F.S. Levin, DAMOP (Monterey, CA 1990).
 5. Finite element calculation of the muonic molecular ions, JS and F. Levin, APS (Washington, DC 1990).
 4. Finite element analysis of the three-body Coulomb system, JS, ICAP (Ann Arbor, MI 1990).
 3. The spectrum of photoexcited Nd^{3+} ions in $LaCl_3$, JS, ICAP (Ann Arbor, MI 1990).
 2. Calculation of the binding energy for low lying states of hydrogen in a superstrong magnetic field, JS and L.R. Ram-Mohan, DAMOP (Windsor, ON 1989).
 1. Finite element calculation of the e^+H phase shifts, JS and F.S. Levin, APS (Baltimore, MD 1988).