**CURRICULUM VITAE**

**NAME** Timothy J. Gay

**DATE OF BIRTH** 23 March 1953 – Ashtabula, Ohio

**CITIZENSHIP** U.S.A.

**MARITAL STATUS** Married Anna Christine Nothstine – 6 September 1975

 Two children – Frederick Sullivan, born 4 September 1984;

 Bertram McClelland, born 18 January 1988

**ADDRESS** Work: Home:

 073 Jorgensen Hall 2928 Woodsdale Boulevard

 University of Nebraska Lincoln, Nebraska 68502

 Lincoln, Nebraska 68588–0299 (402) 423–4746

 (402) 472–2773

 tgay1@unl.edu

**PRESENT POSITION** Willa Cather Professor of Physics, Department of Physics and

 Astronomy, University of Nebraska (2017 - )

**PREVIOUS ACADEMIC** Professor, Department of Physics and Astronomy, University of

**AND RESEARCH** Nebraska (1993 – 2017)

**POSITIONS**

Professor (1992–93), Associate Professor (1989–92), Assistant

 Professor (1984–89), Research Assistant Professor (1983–84), Physics

 Department, University of Missouri–Rolla

 Research Associate and Lecturer (1982-1983), Research Staff Physicist and Lecturer (1980-1982), Physics Department, Yale University

 Graduate Laboratory Fellow, Physics Division, Argonne National

 Laboratory (1978 – 1980)

 Undergraduate Summer Student Fellow, Physics Division, Argonne

 National Laboratory (1974)

 Undergraduate Teaching Assistant, Physics Department, California

 Institute of Technology (1974 – 1975)

 Undergraduate Research Assistant, Geology and Geophysics

 Department, California Institute of Technology (1972 – 1975)

**EDUCATION** University of Chicago — Ph.D., 1980 (Physics)

 S.M., 1976 (Physics)

 California Institute of Technology – B.S., 1975 (Physics)

 Phillips Academy, Andover, Massachusetts

**HONORS** & **AWARDS** Willa Cather Professorship, University of Nebraska (2017 - )

 Outstanding Referee Award, American Physical Society (2009)

 Fellow, American Physical Society (elected 1994) *“For his studies of fundamental atomic collision processes, particularly with regard to to spin-dependent effects, and for important contributions to the development of polarized electron technology.”*

Outstanding Postdoctoral Mentor Award, University of Nebraska - Lincoln (2018)

 Graduate Laboratory Fellowship, Argonne National Laboratory

 (1978 – 1980)

 Outstanding Teacher Award, University of Missouri–Rolla, 1987,

 1988, 1990, 1991

 Faculty Excellence Award, University of Missouri-Rolla, 1987,

 1988, 1989, 1990, 1991, 1992 (only Assistant Professor to receive

 this award in 1987, 1988)

 Certificate of Recognition for Contributions to Students, University of Nebraska Parents Association, 1995, 1999, 2004, 2006, 2007, 2010, 2012

 American Physical Society Centennial Speaker

 Louis Begeman Memorial Lecturer, University of Northern Iowa

 Gaseous Electronics Conference Foundations Plenary Lecture

 Chancellor’s Distinguished Lecture, University of Nebraska – Lincoln

 Sigma Xi Distinguished Lecturer (2019 – 2021)

**GRANT SUPPORT** National Science Foundation, “Polarized Electron Physics,” including

Research Experiences for Undergraduate (REU), International Programs (INT), and Research Opportunity Award (ROA) supplements; $7,246,920; 4/1/86 – 8/31/24 (principal investigator).

 NSF Major Research Instrumentation (MRI) Award, “Development of a

 Rubidium Spin Filter” $370,000 (including $90,000 UNL matching

 funds); 8/01/08 – 7/31/11 (principle investigator).

 National Science Foundation, “Accurate Electron Spin Optical

 Polarimetry (AESOP)”; $565,000; 10/1/16 – 9/30/19 (principal investigator).

Australian Research Council, “Cold Positron Interactions with Ultracold Rubidium Atoms,” $560,000A; 7/1/20 – 6/30/23 (co-principal investigator).

 National Science Foundation EPSCoR Research Infrastructure

 Improvement Program: Track 2, “Collaborative Research: Imaging and Controlling Ultrafast Dynamics of Atom, Molecules, and Nanostructures” $6,000,000; 8/01/14 – 7/31/17 (co-principle investigator; $85,702 for my group).

 University of Nebraska Faculty Fellowship Program, “Collaborative

 National Science Foundation, “Determination of the Electron Neutrino Rest Mass via Tritium Decay;” $51,242; 8/01/03 – 7/31/08 (principle investigator; subcontract to the University of Texas – Austin).

 Department of Energy, “Experimental Investigations of Electron Capture from Atomic Hydrogen and Deuterium by Alpha Particles;” $262,278; 9/15/84 – 9/14/93 (principal investigator).

 National Science Foundation, “Stringent Tests of Theory for Fundamental Ion–Atom Collisions;” $1,068,321; 6/1/84 – 1/01/91 (co–

 principal investigator).

 NASA Nebraska Space Grant, “Collisions Between Polarized Electrons and Chiral Molecules;” Graduate Fellowship; $7,000; 9/11 – 8/14 (co- principal investigator).

University of Missouri Weldon Spring Grant, “Polarized Electron–

 Atom Collisions;” $27,364 (principal investigator).

 University of Missouri Research Initiative Grant, “Laser-Polarized

 3He Neutron Spin Filter;” $44,738; 2/93 – 2/94 (co-principal

 investigator).

 Center for Materials Research and Analysis, University of Nebraska, “A

**GRANT SUPPORT** Spin–Polarized Electron Source for Studies of Magnetism;” $14,000;

(continued) 1/1/94–12/31/94 (principal investigator).

 National Science Foundation Instrumentation Grant, “Acquisition and

 Construction of a Spin-Polarized Inverse Photoemission Spectrometer;” $80,727; 7/1/94 – 12/31/95 (co-principal investigator).

 Center for Materials Research and Analysis, University of Nebraska,

 “The Electronic Structure of Molecular Cluster Films;” $10,730; 6/1/94 – 12/31/94 (co-principal investigator).

 National Science Foundation EPSCoR Grant; Subcontract to

 “Nanostructured Devices Group;” $42,552; 7/1/95 – 6/30/96 (co-principal investigator), Center for Materials Research and Analysis, University of Nebraska, “Construction of a Compact Mott Polarimeter;” $10,000; 9/1/96 – 6/30/97 (principal investigator).

 NATO Collaborative Research Grant, “Manifestations of Chirality in Molecular Physics;” $11,000; 11/1/97 – 12/31/99 (with E. A. Seddon, Daresbury Laboratory, UK).

 University of Nebraska Research Council, “Exotic Chiral Compounds;” $2,985; 5/1/97 – 4/31/99 (principal investigator).

 University of Nebraska Faculty Fellowship Program, “Collaborative

 Research, University of Texas,” $2,500; 9/1/01 – 6/30/02

 (principle investigator).

 University of Nebraska; Undergraduate Research (Funded by the NSF and Pepsi Foundation); $31,100; 2001-20013 (principle investigator).

 University of Nebraska College of Arts and Sciences Research Travel Grant, $1,500; 2017 (principal investigator).

 University of Nebraska Atomic, Molecular, and Optical Physics Program of Excellence Grant, “Oxygen Spectroscopy,” $2,200; 2017 (principal investigator).

 University of Nebraska Atomic, Molecular, and Optical Physics Program of Excellence Grant, “Pt for Chiral Nanostructures,” $1,000; 2019 (principal investigator).

 University of Nebraska Collaboration Initiative Grant, “Quantum Electron Beams” $298,916. 07/01/2019 - 06/30/2021 (co-principle investigator).

UNL Collaboration Initiative Grant, “Chiral Piezoelectricity” $44,000 07/01/2019 - 06/30/2021 (co-principle investigator).

**INVITED TALKS** *230 invited physics presentation, colloquia, and seminars at professional meetings, universities, and government laboratories in the United States, Canada, PRC, Great Britain, France, Australia, Portugal, Denmark, Ireland, Argentina, the Netherlands, and Germany, including:*

 Conference on the Application of Accelerators in Research and Industry

 (Denton, Texas; 11/86).

 International Symposium on Ion-Atom Collisions X (Frankfurt, FRG;

 7/87).

 Symposium on Atomic Spectroscopy and Highly-Ionized Atoms

 (Argonne National Laboratory; 8/87).

 Conference on the Application of Accelerators in Research and Industry

 (Denton, Texas; 11/88).

 Annual Meeting of the Division of Atomic, Molecular, and Optical

 Physics, American Physical Society (Monterey, California; 5/90).

 Conference on the Application of Accelerators in Research and Industry

 (Denton, Texas; 11/90).

 Sixth International Symposium on Correlations and Polarization in

 Electronic and Atomic Collisions and (e,2e) Reactions (Adelaide, South

 Australia; 7/91).

 Forty-fifth Annual Gaseous Electronics Conference (Boston,

 Massachusetts; 10/92).

 Eighteenth International Conference on the Physics of Electronic and

 Atomic Collisions (Aarhus, Denmark; 7/93).

 Applications of He Optical Pumping: A Colloquium Dedicated to the

 Memory of Laird Schearer (Paris, France; 6/94).

 Peter Farago Symposium on Electron Physics (Edinburgh, Scotland;

 4/95).

 Workshop on Polarized Electron Sources and Low-Energy Polarimeters

 (Amsterdam, Netherlands; 9/96).

 Annual Meeting of the Division of Atomic, Molecular, and Optical

 Physics, American Physical Society (Washington, DC; 4/97).

 Manfred Fink Honor Symposium, University of Texas (Austin, Texas; 9/97).

**INVITED TALKS** Wilhelm Raith Festspiel, University of Bielefeld (Bielefeld, Germany;

(continued) (11/97).

 Plenary Speaker, American Association of Physics Teachers Annual Summer Meeting (Lincoln, Nebraska; 8/98).

 Tenth International Symposium on Correlations and Polarization in

 Electronic and Atomic Collisions (Beijing, China; 8/99).

 Plenary Review Talk, DOE Workshop on Electron Driven Processes, Stevens Institute of Technology (Hoboken, New Jersey, 3/00).

 Fifty-third Annual Gaseous Electronics Conference (Houston, Texas; 10/00).

 American Physical Society General Meeting (Washington, DC; 4/01).

 Annual Meeting of the Division of Atomic, Molecular, and Optical

 Physics, American Physical Society (London, Ontario, Canada; 5/01).

 Twenty-second International Conference on Photonic, Electronic, and

 Atomic Collisions (Santa Fe; 7/01).

 Workshop on Polarized Electron Sources and Polarimeters (PESP 2002)

 (Danvers, Massachusetts; 9/02).

 Workshop on Electron Collisions with Biological Molecules, Institite for Theoretical Atomic and Molecular Physics, Harvard University

 (Cambridge, Massachusetts; 10/03)

 Annual American Association for the Advancement of Science Meeting

 (Seattle, Washington; 02/04)

 Annual Meeting of the Division of Atomic, Molecular, and Optical

 Physics, American Physical Society (Tuscon, Arizona; 06/04).

 Thirteenth International Symposium on Correlations and Polarization in

 Electronic and Atomic Collisions (Buenos Aires, Argentina; 8/05).

Workshop on the Forefront of AMO Science: Clusters, Ions, Dressed States (Lawrence Berkeley Laboratory Advanced Light Source User’s Meeting, Berkeley, California 10/05)

**INVITED TALKS** Annual Meeting of the Division of Atomic, Molecular, and Optical

(continued) Physics, American Physical Society (Knoxville, Tennessee, 05/06).

 2006 User’s Meeting of the SRC (Stoughton, Wisconsin, 10/06)

Gordon Research Conference on Atomic Physics (Tilton, New Hampshire, 7/07)

 Workshop on Polarized Electron Sources and Polarimeters (PESP 2008)

 (Newport News, VA; 10/08).

 Sixty Second Annual Gaseous Electronics Conference (Saratoga Springs, New York; 10/09).

 Annual Meeting of the Division of Atomic, Molecular, and Optical

 Physics, American Physical Society (Atlanta, Georgia; 06/11).

 Sixteenth International Symposium on Correlations and Polarization in

 Electronic and Atomic Collisions (Dublin, Ireland; 8/11).

 Festspiel for Vincent McKoy, California State University – Fullerton (Fullerton, CA 6/12)

 Chancellor’s Distinguished Lecture, University of Nebraska (Lincoln, NE 4/13)

 Louis Begeman Memorial Lecture, University of Northern Iowa (Cedar Falls, IA, 2/14)

Testimony delivered to the U.S. House of Representatives Subcommittee on Commerce, Manufacturing, and Trade on Concussions and Protective Equipment in American Football (Washington, DC 3/14)

 6th Workshop on Parity Violation and Hadron Structure (Syracuse, NY 7/14)

Sixty-Seventh Annual Gaseous Electronics Conference (Raleigh, North Carolina; 11/14).

TheXVIII International Workshop on Low-Energy Positron and Positronium Physics & the XIX International Symposium on Electron- Molecule Collisions and Swarms (Lisbon, Portugal; 7/14)

 Sixty-Eight Annual Gaseous Electronic Conference Plenary Foundations Lecture (Honolulu, HI; 10/15)

SPIN 2016 (Champaign-Urbana, IL; 9/16)

**INVITED TALKS**  Nineteenth International Symposium on Correlations and Polarization in

(continued) Electronic and Atomic Collisions (Palm Cove, Australia ; 8/17).

 Seventy-Second Annual Gaseous Electronic Conference (College Station, TX; 10/19)

### Beam Polarization and Polarimetry at EIC, (Brookhaven National Laboratory (*via* Zoom); 6/20)

Twenty-Second International Symposium on Correlations and Polarization in Electronic and Atomic Collisions (Toronto, Canada; 8/23).

 Seventy-Sixth Annual Gaseous Electronic Conference (Ann Arbor, MI; 10/23)

**PROFESSIONAL** Referee for the *Physical Review* (A and B), *Physical Review Letters*, **SERVICE** *American Journal of Physics,* *Review of Scientific Instruments*, *Journal*

 *of Physics* *A* and *B*, *Europhysics Letters, Measurement Science and Technology*, *Journal of GeophysicalResearch*, *Journal of Chemical Physics*, *Nuclear Instruments and Methods*, *CommunicationsPhysics*, *Zeitschrift für Physik*, *Physica Scripta*, *Canadian Journal of Physics*, *Journale de Physique*, Journal of the IEEE, American Institute of Physics Press, NSF, NASA, Australian Research Council, Canadian Research Council, W.A. Benjamin, Inc., Worth Publishers, the National Academy of Sciences, and the Research Corporation.

External Tenure and Promotion Review Committees: University of

 Oklahoma, University of Toledo, University of North Texas, University

 of Missouri-Rolla, University of Manitoba, Denison University, University of Newcastle, Australian National University, Illinois Wesleyan University, University of Oregon, and University of Saudi Arabia.

 External Examiner on Ph.D. Thesis Committees: Australian National University (3), University of Western Australia, Flinders University, University of Sao Paolo.

Member of the Organizing Committee for the Eleventh International Symposium on Ion-Atom Collisions (Manhattan, Kansas; 8/89).

 Organizer and Chairman of Symposium on “Spin-Polarized Atomic

 Physics,” Annual Meeting of the Division of Atomic, Molecular, and

 Optical Physics, American Physical Society (Reno, Nevada; 5/93).

 Chairman of the Organizing Committee for the conference “Two–Center

Effects in Ion–Atom Collisions: A Symposium Honoring M.E. Rudd on

 the Occasion of his Retirement” (Lincoln, Nebraska; 5/94).

Undergraduate Research Prize Selection Committee, Division of

 Atomic, Molecular, and Optical Physics, American Physical Society

 (1994).

 Executive Committee, Division of Atomic, Molecular, and Optical Physics, American Physical Society (1996-99).

 Exhibits Chairman, Division of Atomic, Molecular and Optical Physics/American Physical Society Centennial Meeting (1997-99).

 Executive Committee, Gaseous Electronics Conference (1997-2000).

 American Physical Society Centennial Speaker (1998-99).

 University of Nebraska Speaker’s Bureau (1998-99).

**PROFESSIONAL** Organizer and Chairman of Symposium on "Recent Advances in

**SERVICE** Scattering of Electrons by Atoms and Molecules," American Physical

(continued) Society Centennial Meeting (Atlanta, Georgia; 3/99).

 Secretary/Treasurer, Division of Atomic, Molecular, and Optical

 Physics, American Physical Society (1999-2002).

 Member of Review Panel; Experimental Atomic, Molecular and Optical Physics Program of the National Science Foundation Physics Division (1999-2000; 2002-2003; 2009-2010).

 Member of Committee on Atomic, Molecular, and Optical Science

 (CAMOS); National Research Council (2000-2002; 2009-2011).

 International Scientific Committee for the Eleventh International

 Symposium on Polarization and Correlation in Electronic and

 Atomic Collisions (2000-2001).

 General Committee of the International Conference on the Physics

 of Electronic, Atomic, and Photonic Collisions (2001-2007).

 International Scientific Committee for the Eleventh International

 Symposium on Polarization and Correlation in Electronic and

 Atomic Collisions (2001-2003).

 Co-Chair, Local Organizing Committee, 2005 Meeting of the Division

of Atomic, Molecular, and Optical Physics, American Physical Society

 (2002-2005)

 Chemistry Division Review Panel, Argonne National Laboratory (2003)

International Advisory Committee for the 12th International Symposium on Polarization and Correlation in Electronic and Atomic Collisions (2004-2005)

Chair, Fellowship Committee of the Division of Atomic, Molecular, and Optical Physics of the American Physical Society (2004-2005)

Chair, Program Committee of the Division of Atomic, Molecular, and Optical Physics of the American Physical Society (2006-2007)

Vice-Chair, Chair-Elect, and Chair of the Division of Atomic, Molecular, and Optical Physics (DAMOP) of the American Physical Society (2004-2007)

 Physics Policy Committee, American Physical Society (2005-2007)

**PROFESSIONAL** Atomic, Molecular, and Optical Physics Program Review Panel,

**SERVICE** Lawrence Berkeley Laboratory (2005)

(continued)

 National Science Foundation, Committee of Visitors, Directorate for

 Math and Physical Sciences (2006).

 International Advisory Committee for the 13th International Symposium

 on Polarization and Correlation in Electronic and Atomic Collisions (2006-2007).

Chair, Nominating Committee of the Division of Atomic, Molecular, and Optical Physics of the American Physical Society (2008-2009).

Member, Meeting Improvement Committee of the Division of Atomic, Molecular, and Optical Physics of the American Physical Society (2008-2009)

 Committee on Meetings, American Physical Society (2010 - 2012); Chair (2012 – 2013)

 Organizer and Chairman of Symposium on "Recent Advances in

The Applications of Optical Pumping of Alkali Atoms," American Physical Society Annual DAMOP Meeting (Houston, Texas, 5/10).

 International Advisory Committee for the 16th International Symposium

 on Polarization and Correlation in Electronic and Atomic Collisions (2010-2011).

 Allis Prize Committee, American Physical Society (2011 – 2015)

 Nominating Committee, Few-Body Physics Topical Group, American Physical Society (2011 – 2013)

 Education Committee, Division of Atomic, Molecular, and Optical Physics (DAMOP), American Physical Society (2011 – 2014)

 Chair, Task Force to Re-envision the April Meeting of the American Physical Society (2013 – 2014)

American Physical Society Divisional Counselor, Division of Atomic, Molecular, and Optical Physics (2014-2018)

“Nifty-Fifty” Speaker, US Science and Engineering Festival (2015- )

Editorial Advisory Board, Journal of Physics B, Institute of Physics (IOP), UK (2015-17)

 American Physical Society Board of Directors (2016 – 2018)

 **PROFESSIONAL** American Physical Society, Topical Group on Precision Measurements

 **SERVICE** and Fundamental Constants, Nominating Committee (2016 - 2019).

 (continued)

 International Advisory Committee, 17th (e,2e), Double Photo-ionization & Related Topics Polarization and Correlation in Electronic & Atomic Collisions (2016 – 17)

 American Physical Society Speaker of the Council (2018)

 Commissioner, International Union of Pure and Applied Physics (IUPAP) Commission on Atomic, Molecular, and Optical Physics (2017 – 2021)

 American Physical Society, 2019 Strategic Plan Steering Committee (2017- 19)

 National Science Foundation, Committee of Visitors, Directorate for

 Math and Physical Sciences (2019)

 National Science Foundation, Science and Technology Center Adjudication Panel (2019)

 American Physical Society, CEO Search Committee (2020)

 American Physical Society, Allis Prize Selection Committee (2021 – 2022)

**PATENTS** H.Batelaan, B.A.Hitt, B.G.Birdsey, and T.J.Gay. U.S. Patent 6590923, “A Rubidium Spin Filter” (1998).

 T.J.Gay, H. Batelaan, E.R.Jones, and E. Brunkow. U.S. Patent 1011337, “Fast Spin-Polarized Electron Source” (2021)

**STUDENTS Ph.D.**

 Victor Irby (University of Missouri-Rolla, 1990),

 Alabama Museum of Science

 Kanishka Wijayaratna (University of Missouri-Rolla, 1992),

 Professor, Physics Department, University of Colombo, Sri Lanka.

 Edward Stevens (University of Missouri-Rolla, 1993),

 President, Metastable Technologies, Inc.

 Kenneth Trantham (University of Nebraska, 1996), Professor

 of Physics and Chair, University of Nebraska - Kearny.

 Hasan Al-Khateeb (University of Nebraska, 2000), Instructor of

 Physics, Jordan Institute of Science and Technology.

 Benjamin Birdsey (University of Nebraska, 2003)

 Gage Technologies

 Adam Green (University of Nebraska, 2003)

 Professor of Physics, University of St. Thomas

 Jack W. Maseberg (University of Nebraska, 2009)

 Associate Professor of Physics, Fort Hays State University

 Munir H. Pirbhai (University of Nebraska, 2013)

 Assistant Professor, St. Lawrence University

 Joan M. Dreiling (University of Nebraska 2014)

 Honeywell Corporation

 Eric T. Litaker (University of Nebraska 2014)

 Nathan B. Clayburn (University of Nebraska, 2017)

 Postdoctoral Research Fellow, Amherst College, Amherst, MA

 Evan Brunkow (University of Nebraska, 2018)

 Instructor of Physics, Southeast Community College, Beatrice, NE

 Karl Ahrendsen (University of Nebraska, 2022)

 Postdoctoral Research Fellow – Smith College, Northampton, MA

**STUDENTS M.S.**

(continued) Steve Yallaly (University of Missouri-Rolla, 1988)

 McDonnell-Douglas Corporation

 William Meyer (University of Missouri-Rolla, 1991)

 NASA Glenn Research Center

 Kenneth Trantham (University of Missouri-Rolla, 1993)

 Ph.D. University of Nebraska

 Justin Zohner (University of Nebraska, 2004)

Northrup-Grumman Corporation

 Jonathan Paxon Reyes (University of Nebraska, 2005)

 University of Nebraska

 Joshua R. Machacek (University of Nebraska, 2009)

 Ph.D., ANU

 **Undergraduates** 100 Undergraduate Research Assistants from University of Missouri-Rolla, University of Nebraska, Western Michigan University, University of Michigan-Dearborn, Nebraska Wesleyan University, University of St.Thomas, Vassar College, Swarthmore College, Fort Hays State College, Harvey Mudd College, Evergreen College, University of Western Washington, the Georgia Institute of Technology, The University of Oklahoma, Smith College,

 Carlton College, and the University of Chicago.

 **High School**

 11 high school students supervised in laboratory projects.

**POSTDOCTORAL** Murtadha A.M. Khakoo (now at California State University – Fullerton)

**RESEARCH**

**ASSOCIATES** John Wm. Edwards (Nuckolls Corporation; deceased)

 Hans Geesmann (Daimler-Benz Corporation, Germany)

 John Furst (University of Newcastle (Australia))

 Martin Johnston (University of St. Thomas)

 Herman Batelaan (University of Nebraska - Lincoln)

 Mark Rosenberry (Sienna College)

 Vola Andrianarijaona (Pacific Union College)

**POSTDOCTORAL** Joan Dreiling (Quantinuum Corporation)

**RESEARCH**

**ASSOCIATES** Eric Jones (SUNY Stony Brook)

(continued)

 Keith D. Foreman (University of Nebraska - Lincoln)

 Sam Keramati (University of Toronto)

**PUBLICATIONS**

**BOOKS**

1) T.J. Gay and A.F. Starace, eds., *Two-Center Effects in Ion-Atom Collisions*, AIP Conference

 Proceedings Vol. #362 (AIP, New York, 1996).

2) T.J.Gay, *Football Physics – The Science of the Game* (Rodale, Easton, PA, 2004).

3) T.J.Gay, *The Physics of Football* (Re-titled and revised 2nd edition of *Football Physics*; Harper-Collins, New York, 2005).

**INVITED REVIEW PAPERS**

 1) M.E. Rudd, Y.-K. Kim., D.H. Madison, and T.J. Gay, “Electron Production in Proton Collisions with Atoms and Molecules: Differential Cross Sections,” Rev. Mod. Phys. **64**, 441 (1992).

 2) T.J. Gay and F.B. Dunning, “Mott Electron Polarimetry,” Rev. Sci. Instrum. **63**, 1635 (1992).

 3) T.J. Gay, “Electron Polarimetry,” in *Experimental Methods in the Physical Sciences – Atomic, Molecular, and Optical Physics: Charged Particles*, F.B. Dunning and R.G. Hulet eds. (Academic Press, New York, 1995).

 4) T.J. Gay, “Metastable Atom Sources,” in *Experimental Methods in the Physical Sciences – Atomic, Molecular, and Optical Phyics: Atoms and Molecules*, F.B. Dunning and R.G. Hulet eds. (Academic Press, New York, 1996).

 5) T.J. Gay, “What Physics Do We Learn From Integrated Stokes Parameter Measurements With Polarized Electrons?,” Tsinghua University Review of Science and Technology **6**, 458 (2001).

6) T.J. Gay, “Physics and Technology of Polarized Electron Scattering From Atoms and Molecules,” Adv.At.Mol.Phys. **57**, 157 (2009).

**REFEREED PUBLICATIONS**

 1) H.G. Berry, G. Gabrielse, T.J. Gay, and A. E. Livingston, “Material-Dependent Variations of Alignment in Beam-Foil Spectroscopy,” Physica Scripta **16**, 99 (1977).

 2) R.D. Hight, R.M. Schectman, H.G. Berry, G. Gabrielse and T.J. Gay, “Alignment of Helium Excited by Thin Carbon Foils,” Phys. Rev. A **16**, 1805 (1977).

 3) T.J. Gay and H.G. Berry, “Temperature Dependence of Alignment Production in HeI by Beam–Foil Excitation,” Phys. Rev. A **19**, 952 (1979).

**REFEREED PUBLICATIONS** (page 2)

4) R.M. Schectman, R.D. Hight, S.T. Chen, L.J. Curtis, H.G. Berry, T.J. Gay, and R. Deserio, “Orientation and Alignment of the 3p1P and 4d1D Levels of Neutral He,” Phys. Rev. A **22**, 1591 (1980).

 5) T.J. Gay and H.G. Berry, “Optical Observations of Molecular Dissociation in Thin Foils,” J. Phys. B **13**, L199 (1980).

 6) T.J. Gay, H.G. Berry, R. Deserio, H.P. Garnir, R.M. Schectman, N. Schaffel, R. D. Hight, and D.J. Burns, “Energy Dependence of Alignment in Foil Collision-Excited n = 3 States in HeI,” Phys. Rev. A **23**, 1745 (1981).

 7) T.J. Gay, H.G. Berry, and R. Deserio, “Molecular Effects in Beam–Foil Collision Induced Alignment of HeI,” Phys. Rev. A **23**, 1761 (1981).

 8) G.D. Fletcher, M.J. Alguard, T.J. Gay, V.W. Hughes, C.W. Tu, P.F. Wainwright, M.S. Lubell, W. Raith, and F.C. Tang, “Measurements of Spin Exchange Effects in Electron–Hydrogen Collisions: 90˚ Elastic Scattering from 4eV to 30eV,” Phys. Rev. Lett. **48**, 1671 (1982).

 9) T.J. Gay, G.D. Fletcher, M.J. Alguard, V.W. Hughes, P.F. Wainwright, and M.S. Lubell, “Further Measurements of Spin Exchange Effects in Electron Impact Ionization of Atomic Hydrogen,” Phys. Rev. A **26**, 3664 (Brief Report; 1982).

10) T.J. Gay, “A Simple Optical Electron Polarimeter,” J. Phys. B **16**, L553 (1983).

11) G.D. Fletcher, M.J. Alguard, T.J. Gay, V.W. Hughes, P.F. Wainwright, M.S. Lubell, and W. Raith, “An Experimental Study of Spin–Exchange Effects in Elastic and Ionizing Collisions of Polarized Electrons with Polarized Hydrogen Atoms,” Phys. Rev. A **31**, 2854 (1985).

12) T.J. Kvale, D.G. Seely, D.M. Blankenship, E. Redd, T.J. Gay, M. Kimura, E. Rille, J.L. Peacher, and J.T. Park, “Angular Differential Cross Sections for the Excitation of 11S Helium to the 21P States by 25– to 100–keV Proton Impact,” Phys. Rev. A **32**, 1369 (1985).

13) G.D. Fletcher, T.J. Gay, and M.S. Lubell, “New Insights Into Mott–Scattering Electron Polarimetry,” Phys. Rev. A **34**, 911 (1986).

14) E. Redd, T.J. Gay, D.M. Blankenship, J.T. Park, J.L. Peacher, and D.G. Seely, “Measurements of Helium Excitation in Be+, Mg+ –He Collisions,” Nuc. Instrum. and Meth. **B24/25**, 305 (1987).

15) R.E. Olson, T.J. Gay, H.G. Berry, E.B. Hale, and V.D. Irby, “Saddle–Point Electrons in Ionizing Ion–Atom Collisions,” Phys. Rev. Lett **59**, 36 (1987).

16) E. Redd, T.J. Gay, D.M. Blankenship, J.T. Park, J.L. Peacher, and D.G. Seely, “Angular–Differential Studies of Excitation in Quasi–One–Electron Collisions at ‘High’ Energy,” Phys. Rev. A **36**, 3475 (Rapid Communication; 1987).

**REFEREED PUBLICATIONS**  (page 3)

17) T.J. Gay, H.G. Berry, E.B. Hale, V.D. Irby, and R.E. Olson, “ ‘Saddle–Point’ Ionization,” Nucl. Instrum. and Meth., **B31**, 336 (1988).

18) V.D. Irby, T.J. Gay, J. Wm. Edwards, E.B. Hale, M.L. McKenzie, and R.E. Olson, “Projectile–Charge Dependence of Ejected–Electron Spectra,” Phys. Rev. A **37**, 3612 (Rapid Communication; 1988).

19) T.J. Gay, E. Redd, D.M. Blankenship, J.T. Park, J.L. Peacher, and D.G. Seely, “Charge Transfer in Be+, Mg+ –He Collisions,” J. Phys. B **21**, L467 (1988).

20) R.E. Olson and T.J. Gay, “Dynamics of Antimatter–Atom Collisions,” Phys. Rev. Lett. **61**, 302 (1988).

21) J.L. Peacher, E. Redd, D.G. Seely, T.J. Gay, D.M. Blankenship, and J.T. Park, “Elastic Angular–Differential Cross Sections for Quasi-One-Electron Collision Systems at Intermediate Energies: (Na+, Li+) + H and (Mg+,Be+) + He,” Phys. Rev. A **39**, 1760 (1989).

22) T.J. Gay and R.E. Olson, “Ionization of Helium by Protons, Electrons, and Their Antiparticles: Dynamical Effects of Projectile Mass and Charge in Angular–Differential Cross Sections,” Nucl. Instru. and Meth. **B40/41**, 104 (1989).

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Current 15 April 2023