

CURRICULUM VITAE

DUNCAN ALASDAIR TATE

(Updated 1/4/10)

ADDRESS: Department of Physics and Astronomy
Colby College
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Waterville, ME 04901
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5 Maura Court
Waterville, ME 04901

(207) 877-0094

DATE OF BIRTH: 25 April 1962

PLACE OF BIRTH: Leeds, United Kingdom

MARITAL STATUS: Married

EDUCATION : M.A., Balliol College, University of Oxford, 1999
D.Phil., Experimental Physics, University of Oxford, 1987
B.A. (*Honours*), Physics, Balliol College, University of Oxford, 1983

DISSERTATION: *Investigations of Simple Atomic Systems by Laser Spectroscopy*
Advisor: Dr. Derek N. Stacey

EMPLOYMENT:

2006-2009 Chair, Department of Physics and Astronomy, Colby College
2006-present Professor of Physics, Colby College
2002 & 2005 Chercheur Associé, CNRS, Laboratoire Aimé Cotton, Orsay, France (June - September 2002, and June 2005)
1999-2006 Associate Professor of Physics, Colby College
1992-1999 Assistant Professor of Physics, Colby College
1996-1997 Visiting Assistant Professor of Physics, University of Virginia
1992 Visiting Lecturer in Physics, University of Illinois at Chicago
1990-1992 Postdoctoral Research Associate, University of Illinois at Chicago
1987-1990 Postdoctoral Research Associate, University of Virginia
1987 Postdoctoral Research Associate, University of Cambridge, UK
1984-1986 Graduate Teaching Assistant, University of Oxford, UK

HONORS:

UK Science and Engineering Research Council Graduate Fellowship, 1983 - 1986
College Scholarship, Balliol College, Oxford, 1981 - 1983
Physics, Mathematics and Engineering Moderations, 1st Class Honours, University of Oxford, 1981 (first year exams)

PROFESSIONAL SOCIETIES:

American Physical Society
Society of Physics Students

RESEARCH INTERESTS: experimental atomic, molecular, and optical physics - high resolution ultraviolet, visible and infrared laser spectroscopy, Rydberg atoms, interactions of atoms, molecules and solids with intense ultra short laser pulses, atom trapping.

OTHER RESEARCH EXPERIENCE:

Reviewer for American Journal of Physics
Proposal reviewer for American Chemical Society Petroleum Research Fund
Proposal reviewer for Research Corporation
Proposal reviewer for National Science Foundation Division of Atomic, Molecular, and Optical Physics
Local Organizing Committee, Fall 1999 Meeting of the New England section of the APS

TEACHING EXPERIENCE:

Graduate Teaching Assistant in physics, University of Oxford, UK - taught and graded for 5 terms in the advanced undergraduate labs in atomic, molecular and optical physics. Experiments included holography, the helium-neon laser, the Stern Gerlach experiment, optical pumping in rubidium, absorption and emission spectroscopy of hydrogen, cadmium, sodium.

Visiting lecturer, University of Illinois at Chicago - responsible for teaching introductory classical mechanics (with calculus) in the spring, 1992 semester.

Assistant Professor, Associate Professor and Professor, Colby College - have taught introductory physics (PH141 & PH142), introductory physics lab (PH141 & PH142), modern physics I and II (PH241 & PH242), modern physics lab (PH241 & PH242), electronics (PH254), advanced electromagnetism I and II (PH321 & PH322), advanced classical mechanics (PH311), experimental atomic physics (PH334), and a general education science course for non-majors (The Elements, PH113).

COURSES TAUGHT AT COLBY

(student enrollments in brackets)

1992-1993:

PH311 Classical Mechanics (2)

PH321 Electricity and Magnetism I (4)

PH142 Foundations of Physics II (59)

PH142 Lab (1 section) (17)

PH142 Discussion (1 section) (17)

PH322 Electricity and Magnetism II (3)

1993-1994:

PH311 Classical Mechanics (6)

(one course relief to set up research lab)

PH142 Foundations of Physics II (62)

PH142 Lab (3 sections) (62)

PH142 Discussion (3 sections) (62)

1994-1995:

PH321 Electricity and Magnetism I (13)

PH141 Lab (2 sections) (36)

PH142 Foundations of Physics II (61)

PH142 Lab (3 sections) (61)

PH142 Discussion (3 sections) (61)

PH311 Classical Mechanics (2)

(Independent Study)

1995-1996:

PH321 Electricity and Magnetism I (4)

PH311 Classical Mechanics (7)

PH142 Foundations of Physics II (82)

PH142 Lab (1 section) (21)

PH142 Discussion (4 sections, 1/2 sem) (82)

PH113j The Elements (29)

1996-1997: On sabbatical at the University of Virginia

1997-1998:

PH321 Electricity and Magnetism I (4)

PH113 The Elements (25)

PH141 Lab (1 section) (18)

PH334 Experimental Atomic Physics (6)

PH142 Discussion (4 sections) (72)

PH142 Lab (1 section) (21)

PH493 Senior Seminar (6)

1998-1999:

PH321 Electricity and Magnetism I (16)

PH241 Modern Physics I (15)

PH241 Lab (15)

PH142 Lab (1 section) (20)

(course off to develop PH142 labs: HHMI)

1999-2000:

PH241 Modern Physics I (13)

PH113 The Elements Lab (16)

PH142B Foundations of Physics II (40)

PH142 Lab (1 section) (17)

PH242 Modern Physics II (10)

PH334 Experimental Atomic Physics (5)

(Team-taught with A. Kortyna)

2000-2001:

PH141 Foundations of Physics I (72)
PH141 Lab (1 section) (17)
PH241 Modern Physics I Lab (15)

PH142A Foundations of Physics II (44)
PH142 Lab (1 section) (17)
PH242 Modern Physics II (13)

2001-2002:

PH141A Foundations of Physics I (41)
PH141B Foundations of Physics I (31)

PH242 Modern Physics II (14)
PH242 Lab (14)
PH334 Experimental Atomic Physics (4)
PH493 Senior Seminar (11)

2002-2003: On sabbatical

2003-2004:

PH241 Modern Physics I (17)
PH241 Lab (17)
PH415 Research Seminar (12)

PH142A Foundations of Physics II (56)
PH142B Foundations of Physics II (29)
PH142 Lab (1 section) (15)

2004-2005:

PH141A Foundations of Physics I (45)
PH141B Foundations of Physics I (42)
PH141 Lab (1 section) (17)

PH242 Modern Physics II (24)
PH311 Classical Mechanics (11)
PH142 Lab (1 section) (10)

2005-2006:

PH141A Foundations of Physics I (37)
PH141B Foundations of Physics I (39)
PH241 Lab (1 section) (13)

PH311 Classical Mechanics (9)
PH334 Experimental Atomic Physics (7)
PH242 Lab (1 section) (9)

2006-2007:

PH141A Foundations of Physics I (48)
PH141B Foundations of Physics I (45)

PH242 Modern Physics II (23)
PH311 Classical Mechanics (17)

2007-2008:

PH141A Foundations of Physics I (48)
PH141B Foundations of Physics I (45)

PH242 Lab (13)
PH254 Essential Electronics (10)
PH254 Lab (10)
PH401/402 Senior Seminar (21)

2008-2009:

PH141A Foundations of Physics I (45)
PH141B Foundations of Physics I (43)

PH145 Lab (15)
PH242 Lab (8)
PH334 Experimental Atomic Physics (7)

2009-2010: On sabbatical

COMMITTEES SERVED ON AT COLBY:

- 1992-1993: Search Committee - Physics Department (Shelby Nelson)
- 1993-1994: Computer Committee
Academic Subcommittee of Computer Committee
Search Committee - Physics Department (Rhodri Evans)
- 1994-1995: Administrative Committee
Admissions Subcommittee on International Students
Search Committee - Science Division Technician (Chuck Jones)
Rhodes Scholar Interview Panel (Erin T. Mansur)
- 1995-1996: Administrative Committee
Library Committee
Admissions Subcommittee on International Students
Rhodes Scholar Interview Panel (Simon J. Dalgleish)
Search Committee - Physics Department (Tamar More)
- 1996-1997: Sabbatical at University of Virginia
Returned to Colby for physics department Overseer's visit
- 1997-1998: Health Professions Preparation Committee
- 1998-1999: Health Professions Preparation Committee
Administrative Committee
Search Committee - Physics Department (Don Colladay)
Search Committee - Physics Department (Andrew Kortyna)
Search Committee - Chemistry Department (Stephen Theberge)
- 1999-2000: Chair, Science Division
(Nominating Committee, Natural Sciences Grant Committee)
Health Professions Preparation Committee
Administrative Committee
NSF-AIRE Grant Steering Committee
HHMI2 Grant Steering Committee
HHMI3 Grant Steering Committee
Search Committee - Physics Department (Virginia Long)
Search Committee - Physics Department (Charles Lane)
Search Committee - Physics Department (Lisa Lessard)

- 2000-2001: President's Planning Group
 Chair, Science Division
 (Nominating Committee, Natural Sciences Grant Committee)
 Physical Plant Subcommittee of Board of Trustees
 NSF-AIRE Grant Steering Committee
 HHMI2 Grant Steering Committee
 HHMI3 Grant Steering Committee
 Health Professions Preparation Committee
 History Department Reappointment Committee (Paul Josephson)
 Physics Department Reappointment Committee (Virginia Long)
 Search Committee - Physics Department (Brett Fadem)
- 2001-2002: President's Planning Group
 Chair, Science Division
 (Nominating Committee, Natural Sciences Grant Committee)
 NSF-AIRE Grant Steering Committee
 HHMI3 Grant Steering Committee
 Health Professions Preparation Committee
 Sixth Semester Review Committee (Paul Josephson/History)
- 2003-2004: Health Professions Preparation Committee
 Academic Affairs Committee
 College Marshal
 Rhodes Scholar Interview Panel (Justin Juskewitch)
- 2004-2005: Health Professions Preparation Committee
 Academic Affairs Committee
 (and Course Approval Subcommittee)
 College Marshal
- 2005-2006: College Marshal
 Health Professions Preparation Committee
 Advisory Committee for Faculty Personnel Policy
- 2006-2007: Chair, Department of Physics and Astronomy
 Chair, Search Committee - Physics Department (James Porter)
 College Marshal
 Advisory Committee for Faculty Personnel Policy
- 2007-2008: Chair, Department of Physics and Astronomy
 Chair, Departmental Tenure Committee (Virginia Long)
 Departmental Laser Safety Officer
 Advisory Committee for Faculty Personnel Policy

2008-2009: Chair, Department of Physics and Astronomy
Chair, Search Committee - Physics Department (Jonathan McCoy)
Chair, Search Committee - Physics Department (Yoshihiro Sato)
Departmental Laser Safety Officer
OCS Advisory Committee

OTHER SERVICE AT COLBY:

1992-1993: Supervisor - Summer Research Associate - Wallie Leung (^94)

1993-1994: First-year Advisor
Sophomore Physics Major Advisor

1994-1995: First-year Advisor
Undeclared Sophomore Advisor
Sophomore Physics Major Advisor
Junior Physics Major Advisor
Supervisor - Physics Honors Thesis - Dhumal Aturaliye (^95)
Supervisor - Physics Honors Thesis - Julie Rentz (^95)
Supervisor - Physics Senior Thesis - Vincent Cordero (^95)
Supervisor - Summer Research Associate - Dhumal Aturaliye (^95)

1995-1996: First-year Advisor
Undeclared Sophomore Advisor
Junior Physics Major Advisor
Senior Physics Major Advisor
Supervisor - Physics Senior Project - Brian Stenger (^96)
Supervisor - Sophomore Independent Project - Josh Walton (^98)
Supervisor - Summer Research Associate - Josh Walton (^98)
Supervisor - Summer Research Associate - Alex Sobel (^98)

1996-1997: Sabbatical at University of Virginia

1997-1998: First-year Advisor
Senior Physics Major Advisor
Supervisor - Physics Senior Project - Josh Walton (^98)
Supervisor - Summer Research Associate - Ryan Jennerich (^00)

1998-1999: First-year Advisor
Sophomore Physics Major Advisor
Supervisor - Physics Senior Project - Phillip Boone (^99)
Supervisor - Physics Honors Thesis Project - Greg Foltz (^99)
Supervisor - Summer Research Associate - Ryan Jennerich (^00)

1999-2000: First-year Advisor
Junior Physics Major Advisor
Supervisor - Physics Honors Thesis Project - Ryan Jennerich (^00)
Supervisor - Summer Research Associate - Tamas Juhasz (^02)

2000-2001: First-year Advisor
Senior Physics Major Advisor
Supervisor - Physics Senior Project – Adam Rolewicz (‘01)

2001-2002: First-year Advisor
Sophomore Physics Major Advisor
Supervisor - Physics Senior Project – Andrew Keiser (‘02)
Supervisor - Physics Senior Project – Patrick Olsen (‘02)

2003-2004: First-year Advisor
Senior Physics Major Advisor
Supervisor - Physics Senior Project – Jennifer Carini (‘04)
Supervisor - Physics Senior Project – Libby Schundler (‘04)
Supervisor - Physics Senior Project – Monica Thomas (‘04)
Supervisor - Summer Research Associate – Yu-Hwei Chou (‘07)

2004-2005: First-year Advisor
Sophomore Physics Major Advisor
Supervisor - Physics Senior Project – Ka Yan Chan (‘05)
Supervisor - Physics Senior Project – Tsering Wangdi (‘04)

2005-2006: First-year Advisor
Junior Physics Major Advisor
Supervisor - Physics Honors Thesis Project – Mao Zheng (‘06)
Supervisor - Physics Senior Project – Drew Branden (‘07)
Supervisor - Physics Senior Project – Nicholas Stielau (‘06)
Physics Off-Campus Studies Liaison
Campus Advisor to Society of Physics Students

2006-2007: Senior Physics Major Advisor
Junior Physics Major Advisor
Supervisor - Physics Honors Thesis Project – Roy Wilson (‘07)
Supervisor - Physics Senior Project – Margaret Martei (‘07)
Supervisor - Physics Senior Project – Ta-Chung Ong (‘07)
Supervisor - Physics Senior Project – Anders Wood (‘07)
Physics Off-Campus Studies Liaison
Campus Advisor to Society of Physics Students
Supervisor - Summer Research Associate – Roy Wilson (‘07)
Supervisor - Summer Research Associate – Cristian Vesa (‘08)

2007-2008: First-year Advisor
Junior Physics Major Advisor
Supervisor - Physics Honors Thesis Project – Alex Gill (‘08)
Supervisor - Physics Honors Thesis Project – Cristian Vesa (‘08)
Supervisor - Physics Honors Thesis Project – Bill Whitledge (‘08)
Supervisor - Physics Senior Project – Erin Bast (‘08)
Supervisor - Summer Research Associate – Cristian Vesa (‘08)

2008-2009:

First-year Advisor

Senior Physics Major Advisor

Supervisor - Physics Honors Thesis Project –

Tatenda Mahlokozera ('09)

Supervisor - Physics Honors Thesis Project – Lauren Rand ('09)

Supervisor - Physics Senior Project – Joe Meyer ('09)

GRANT PROPOSALS

- 1993-1994: Research Corporation: *Correlations in Two-electron Systems Probed by Hyperfine Structure Measurements*, submitted November, 1993. Status: funded in full (\$52,490 including match from Colby), May 1994.
- 1994-1995: Maine EPSCoR: *High Resolution Laser Spectroscopy of Rydberg States in Barium*, submitted June, 1995. Status: funded in full (\$15,000 including match from Colby), October 1995.
- 1995-1996: Joint Institute for Laboratory Astrophysics (JILA) Visiting Fellowships Program, submitted November, 1995. Status: fellowship awarded January 1996; funding canceled due to Federal budget cuts, March 1996.
- NSF Academic Research Infrastructure Program: *Conventional and Laser Spectroscopy of Atoms and Molecules*, submitted January, 1996. Status: funded in full (\$175,000 including match from Colby), August 1996.
- NSF Research Opportunities Award Program: *Evolution of Excited Atoms* (with T.F. Gallagher, University of Virginia), submitted March, 1996. Status: funded in full (\$29,397), April 1996.
- Stanford Research Systems Equipment Donation Program: gift of a SRS530 Dual Phase Lock-in Amplifier from Dr. John Willison, President of Stanford Research Systems, worth \$3,000, May 1996.
- 2001-2002: Centre National de la Recherche Scientifique (CNRS): three month position (June - August 2002) of Chercheur Associé funded by proposal to CNRS (with P. Pillet, Laboratoire Aimé Cotton, CNRS, Orsay, France). Status: funded in full (\$6,800), December 2001.
- NSF Atomic, Molecular, and Optical Physics (AMOP) Program: *Many-body Effects in a Frozen Rydberg Gas*, submitted September, 2001. Status: funded in full (\$200,261) September 2002.
- 2006-2007: NSF Atomic, Molecular, and Optical Physics (AMOP) Program: *Structure and Dynamics of cold Rydberg Gases*, submitted September, 2006. Status: funded (\$146,000) June 2007.

PRESENTATIONS:

Conferences:

M.G. Boshier, P.E.G. Baird, C.J. Foot, E.A. Hinds, M.D. Plimmer, D.N. Stacey, J.B. Swan, D.A. Tate, D.M. Warrington and G.K. Woodgate, *C.W. Laser Spectroscopy of Atomic Hydrogen*, 18TH CONFERENCE OF THE EUROPEAN GROUP FOR ATOMIC SPECTROSCOPY (EGAS 18), Marburg, Germany, July 1986 (poster).

D.A. Tate, D.G. Papaioannou and T.F. Gallagher, *Phase-Sensitive Above-Threshold Ionization at 8 GHz*, APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 1990 ANNUAL MEETING (DAMOP90), Monterey, California, April 1990 (abstract published in Bulletin of the American Physical Society, **35(5)**, 1157, 1990) (poster).

D.A. Tate, D.G. Papaioannou and T.F. Gallagher, *Phase-Sensitive Above-Threshold Ionization at 8 GHz*, 12TH INTERNATIONAL CONFERENCE ON ATOMIC PHYSICS (ICAP 12), Ann Arbor, Michigan, July 1990 (poster).

K. Boyer, D.A. Tate, T.S. Luk, A. McPherson, C.K. Rhodes, , P.G. Burkhalter, D.J. Nagel, A. Zigler and D.A. Newman, *Generation of X-Rays From BaF₂ Targets*, SEVENTH INTERDISCIPLINARY LASER SCIENCE CONFERENCE (ILS-VII), Monterey California, September 1991 (abstract published in Bulletin of the American Physical Society, **36(7)**, 1959, 1991) (poster)

T.S. Luk, D.A. Tate, K. Boyer and C.K. Rhodes, *Multielectron Dissociative Ionization of Simple Molecules in a $3 \times 10^{17} \text{ Wcm}^{-2}$ Ultraviolet Laser Field*, 1992 ANNUAL MEETING OF THE APS DIVISION OF ATOMIC, MOLECULAR AND OPTICAL PHYSICS, Chicago, Illinois, May 1992 (abstract published in Bulletin of the American Physical Society, **37(3)**, 1133, 1992) (talk)

T.S. Luk, D.A. Tate, K. Boyer and C.K. Rhodes, *Dissociative Ionization of Polyatomic Molecules with Subpicosecond Laser Pulses*, 1992 ANNUAL MEETING OF THE IEEE LASERS AND ELECTRO-OPTICS SOCIETY, Boston, Massachusetts, November 1992 (talk).

D.A. Tate, L.-G. Wang and T.F. Gallagher, *High Sensitivity Near-Infrared Diode Laser Spectroscopy of Hydrogen Sulfide*, XIth INTERNATIONAL CONFERENCE ON LASER SPECTROSCOPY (ELICOLS), Hot Springs, Virginia, June 1993 (poster).

D.A. Tate, L.-G. Wang, T.F. Gallagher and J.-M. Flaud, *Near-Infrared Spectroscopy of Hydrogen Sulfide*, 14th INTERNATIONAL CONFERENCE ON ATOMIC PHYSICS (ICAP - 14), Boulder, Colorado, August, 1994 (poster).

D.A. Tate, L.-G. Wang, T.F. Gallagher, J.-M. Flaud, R. Großkloß, S.B. Rai, R. Stuber and W. Demtroder, *Near-Infrared Spectroscopy of Hydrogen Sulfide*, ATOMIC PHYSICS GORDON CONFERENCE, Wolfboro, NH, July, 1995 (poster).

D.A. Tate and D.N. Aturaliye (95), *Doppler-Free Diode Laser Spectroscopy of the $3s^2P_J - 3p^2D_J$ Fine Structure Multiplet in Atomic Fluorine*, FALL MEETING OF THE NEW ENGLAND SECTION OF THE AMERICAN PHYSICAL SOCIETY, Brunswick, Maine, October 1995 (abstract published in Bulletin of the American Physical Society, **40(14)**, 2092, 1995) (talk).

D.A. Tate and D.N. Aturaliye (95), *Doppler-Free Diode Laser Spectroscopy of the $3s^2P_J - 3p^2D_J$ Fine Structure Multiplet in Atomic Fluorine*, APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 1996 ANNUAL MEETING (DAMOP96), Ann Arbor, Michigan, May 1996 (abstract published in Bulletin of the American Physical Society, **41(3)**, 1119, 1996) (poster)

D.A. Tate and D.N. Aturaliye (95), *Hyperfine Structure Intervals and Absolute Frequency Measurement in the $3s^2P_J - 3p^2D_J$ Fine Structure Multiplet of Fluorine-19 by Diode Laser Spectroscopy*, APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 1997 ANNUAL MEETING (DAMOP97), Washington, DC, April 1997 (abstract published in Bulletin of the American Physical Society, **42(2)**, 988, 1997) (talk)

D.A. Tate and T.F. Gallagher, *Multiphoton Ionization Dynamics of Strontium Rydberg States in Intense Femtosecond Pulses*, APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 1997 ANNUAL MEETING (DAMOP97), Washington, DC, April 1997 (abstract published in Bulletin of the American Physical Society, **42(2)**, 985, 1997) (talk)

D.A. Tate and T.F. Gallagher, *Multiphoton Ionization Dynamics of Barium Rydberg States in Intense Femtosecond Pulses*, APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 1998 ANNUAL MEETING (DAMOP98), Santa Fe, NM, May 1998 (abstract published in Bulletin of the American Physical Society, **43(3)**, 1300, 1998) (poster).

J.R. Lowell, E. Murgu, W.R. Anderson, T.F. Gallagher and D.A. Tate, *Quasistatic Dipole-Dipole Resonant Energy Transfer in a Frozen Rydberg Gas*, presented at the APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 1998 ANNUAL MEETING (DAMOP98), Santa Fe, NM, May 1998 (abstract published in Bulletin of the American Physical Society, **43(3)**, 1259, 1998) (talk).

D.A. Tate and J.P. Walton (98), *Hyperfine Structure Intervals and Isotope Shifts in the $3p^4 4s^4P_J - 3p^4 4p^4D_J$ Fine Structure Multiplet of Atomic Chlorine by Diode Laser Spectroscopy*, presented at the APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 1998 ANNUAL MEETING (DAMOP98), Santa Fe, NM, May 1998 (abstract published in Bulletin of the American Physical Society, **43(3)**, 1319, 1998) (talk).

D.A. Tate and R.M Jennerich (00), *Hyperfine Structure Intervals and Isotope Shifts in the $2p^3 3s^5S_2 - 2p^3 3p^5P_J$ Fine Structure Multiplet of Atomic Oxygen by Diode Laser Spectroscopy*, presented at the APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 1999 ANNUAL MEETING (DAMOP99)/APS CENTENNIAL MEETING, Atlanta, GA, March 1999 (abstract published in Bulletin of the American Physical Society, **44(1)**, 135, 1999) (poster).

R.M Jennerich (00) and D.A. Tate, *Measurements of Hyperfine Structure Intervals in the $3p^4P_J - 3s^4P^{\circ}_J$ Fine Structure Multiplet of ^{14}N by Diode Laser Spectroscopy*, presented at the APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 1999 ANNUAL MEETING (DAMOP99)/APS CENTENNIAL MEETING, Atlanta, GA, March 1999 (abstract published in Bulletin of the American Physical Society, **44(1)**, 135, 1999) (poster).

R. M Jennerich (00) and D. A. Tate, *Hyperfine Structure Intervals and Isotope Shifts in the $2p^3 3s^3S_1 - 2p^3 3p^3P_J$ Fine Structure Multiplet of Atomic Oxygen*, presented at the APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 2000 ANNUAL MEETING (DAMOP00), Storrs, CT, June 2000 (abstract published in Bulletin of the American Physical Society, **45(3)**, 29, 2000) (poster).

R. M. Jennerich (00), A. N. Keiser (02), and D.A. Tate, *Hyperfine Structure Intervals and Isotope Shifts in the $3p^4P_J - 3s^4P^{\circ}_J$ and $3p^4P_J - 3s^4D_J$ Multiplets of Atomic Nitrogen*, presented at the APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 2002 ANNUAL MEETING (DAMOP02), Williamsburg, VA, May 2002 (poster).

A. Kortyna, T. Juhász (02), and D. A. Tate, *Evidence for Collisional l-Mixing in Ultra-cold, Highly -excited Rubidium*, presented at the 18th INTERNATIONAL CONFERENCE ON ATOMIC PHYSICS (ICAP - 18), Cambridge, MA, August, 2002 (poster).

R. M. Jennerich (00), A. Keiser (02), and D.A. Tate, *Hyperfine Structure Coupling Constants and Isotope Shifts from Near-Infrared Transitions of Atomic Nitrogen*, presented at the APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 2003 ANNUAL MEETING (DAMOP03), Boulder, CO, May 2003 (abstract published in Bulletin of the American Physical Society, **48(3)**, 102, 2003) (poster).

D. A. Tate, Wenhui Li, M. W. Noel, M. P. Robinson, P. J. Tanner, T. F. Gallagher, D. Comparat, B. Laburthe Tolra, N. Vanhaecke, T. Vogt, N. Zahzam, and P. Pillet, *Evolution Dynamics of a Dense, Frozen Rydberg Gas to Plasma*, presented at the APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 2004 ANNUAL MEETING (DAMOP04), Tucson, AZ, May 2004 (abstract published in Bulletin of the American Physical Society, **49(3)**, 67, 2004) (talk).

D. A. Tate and J. L. Carini (04), *Study of the Evolution of Cold Rydberg Atoms to Plasma*, presented at the APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 2004 ANNUAL MEETING (DAMOP04), Tucson, AZ, May 2004 (abstract published in Bulletin of the American Physical Society, **49(3)**, 118, 2004) (poster).

D. A. Tate, Wenhui Li, M. W. Noel, M. P. Robinson, P. J. Tanner, T. F. Gallagher, D. Comparat, B. Laburthe Tolra, N. Vanhaecke, T. Vogt, N. Zahzam, and P. Pillet, *Evolution Dynamics of a Cold Rydberg Gas to Plasma*, presented at ULTRACOLD PARYS (ULTRACOLD PLASMAS AND RYDBERG SYSTEMS), International Workshop on Cold Rydberg Gases and Plasma, Gif-sur-Yvette, France, March 2005 (invited talk presented by DAT).

D. Comparat, T. Vogt, N. Zahzam, M. Mudrich, N. Vanhaecke, D. A. Tate, and P. Pillet, *Rydberg Atoms, Ultracold Plasma and Temperature Measurement Using Star Cluster Dynamics*, presented at ULTRACOLD PARYS (ULTRACOLD PLASMAS AND RYDBERG SYSTEMS), International Workshop on Cold Rydberg Gases and Plasma, Gif-sur-Yvette, France, March 2005 (invited talk presented by D. Comparat).

T. Vogt, N. Zahzam, M. Mudrich, B. Laburthe Tolra, D. A. Tate, D. Comparat, and P. Pillet, *Spectroscopy and Dynamics of an Interacting Gas of Rydberg Atoms From Ultracold Rydberg Gases to Ultracold Plasmas*, presented at ULTRACOLD PARYS (ULTRACOLD PLASMAS AND RYDBERG SYSTEMS), International Workshop on Cold Rydberg Gases and Plasma, Gif-sur-Yvette, France, March 2005 (poster).

M. S. Martei (07), A. P. Wood (07), and D. A. Tate, *An injection-locked diode laser for cold Rydberg atom experiments*, presented at the JOINT ANNUAL CONFERENCE OF THE NATIONAL SOCIETY OF BLACK PHYSICISTS AND THE NATIONAL SOCIETY OF HISPANIC PHYSICISTS, Boston, MA, February 2007 (poster presented by M. S. Martei).

R. O. Wilson (07) and D. A. Tate, *External control of electron temperature in ultra cold plasmas*, presented at the JOINT ANNUAL CONFERENCE OF THE NATIONAL SOCIETY OF BLACK PHYSICISTS AND THE NATIONAL SOCIETY OF HISPANIC PHYSICISTS, Boston, MA, February 2007 (talk presented by R. O. Wilson).

D. A. Tate, M. Zheng (06), D. Branden (08), T. Juhasz (02), and A. Kortyna, *Radiative lifetime measurements of high- n Rb Rydberg states*, presented at the APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 2007 ANNUAL MEETING (DAMOP07), Calgary, Alberta, Canada, June 2007 (abstract published in Bulletin of the American Physical Society, **52(7)**, 22, 2007) (talk).

D. A. Tate, R. O. Wilson (07), M. S. Martei (07), and A. P. Wood (07), *External control of electron temperature in ultra cold plasmas*, presented at the APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 2007 ANNUAL MEETING (DAMOP07), Calgary, Alberta, Canada, June 2007 (abstract published in Bulletin of the American Physical Society, **52(7)**, 36, 2007) (poster).

D. A. Tate, A. T. Gill (⁰⁸), C. Vesa (⁰⁸), and W. R. Whitledge (⁰⁸), *Structure and dynamics in ultra-cold Rydberg gases and cold plasmas*, presented at the APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 2008 ANNUAL MEETING (DAMOP08), State College, PA, May 2008 (abstract published in Bulletin of the American Physical Society, **53(7)**, 102, 2008) (poster)

D. A. Tate, D. Branden (⁰⁹), T. Juhasz (⁰²), T. Mahlokozera (⁰⁹), C. Vesa (⁰⁸), R. O. Wilson (⁰⁷), M. Zheng (⁰⁶), and A. Kortyna, *Radiative lifetime measurements of high-*n* Rb Rydberg states*, presented at the APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 2009 ANNUAL MEETING (DAMOP09), Charlottesville, VA, May 2009 (abstract published in Bulletin of the American Physical Society, **54(7)**, 79, 2009) (poster)

Invited Talks:

Laser Spectroscopy of Atomic Hydrogen, seminar, Department of Physical Chemistry, University of Cambridge, UK, March 1987

Phase-Sensitive Above-Threshold Ionization at 8 GHz, seminar, Department of Physics, University of Virginia, Charlottesville, VA, December 1989

Phase-Sensitive Above-Threshold Ionization at 8 GHz, seminar, Princeton Plasma Physics Laboratory, Princeton, NJ, December 1989

Phase-Sensitive Above-Threshold Ionization at 8 GHz, seminar, Department of Physics, Yale University, New Haven, CT, January 1990

Phase-Sensitive Above-Threshold Ionization at 8 GHz, colloquium, Department of Physics, Virginia Polytechnic Institute and State University, Blacksburg, VA, February 1990

Lasers and Spectroscopy, seminar, Department of Natural Sciences, Sweet Briar College, Sweet Briar, VA, April 1990

Phase-Sensitive Above-Threshold Ionization at 8 GHz, seminar, Department of Physics, University of Illinois at Chicago, Chicago, IL, May 1990

Lasers and Spectroscopy, seminar, Department of Physics, Colby College, Waterville, ME, May 1992

Diode Laser Excitation of Rydberg States in Barium, seminar, Maine Association of Physics Faculty, Colby College, Waterville, ME, April 1994

Diode Laser Spectroscopy of Hydrogen Sulfide, seminar, Department of Physics, Bates College, Lewiston, ME, January 1995

Diode Laser Spectroscopy of Hydrogen Sulfide, seminar, Science Division, Colby College, Waterville, ME, March 1995

Diode Laser Spectroscopy of Atoms and Molecules, colloquium, Department of Physics, University of Maine, Orono, ME, April 1996

Diode Laser Spectroscopy of Atoms and Molecules, colloquium, Department of Physics, Washington and Lee University, Lexington, VA, March 1997

Recent Advances in High-Resolution Spectroscopy of Light Atoms Using Diode Lasers, colloquium, National Institute for Standards and Technology, Gaithersburg, MD, July 1997

Doppler-Free Diode Laser Spectroscopy of Atomic Chlorine, seminar, Science Division, Colby College, Waterville, ME, April 1998

Liquids and Frozen Gases: Spontaneous Ionization of Cold Rydberg Atoms, seminar, Department of Physics, Bates College, Lewiston, ME, October 2003

Liquids and Frozen Gases: Spontaneous Ionization of Cold Rydberg Atoms, seminar, Science Division, Colby College, Waterville, ME, February 2004

Evolution Dynamics of a Cold Rydberg Gas to Plasma, invited talk, Ultracold PARYS (Ultracold Plasmas And Rydberg Systems), International Workshop on Cold Rydberg Gases and Plasma, Gif-sur-Yvette, France, March 2005

Experiments on Cold Rydberg Atoms, seminar, Science Division, Colby College, Waterville, ME, November 2007

Sponsored Student Presentations:

Laser Spectroscopy of Rubidium, presented by Dhumal N. Aturaliye ('95) at the New England Section Meeting of the Society of Physics Students (SPS) at Wellesley College, Wellesley, MA, February 1995.

Measurements of Hyperfine Structure Intervals in the $3p\ ^4P_J - 3s\ ^4P\ ^\circ_J$ Fine Structure Multiplet of ^{14}N by Diode Laser, presented by Ryan Jennerich ('00) at the APS DIVISION OF ATOMIC, MOLECULAR, AND OPTICAL PHYSICS 1999 ANNUAL MEETING (DAMOP99)/APS CENTENNIAL MEETING, Atlanta, GA, March 1999 (abstract published in Bulletin of the American Physical Society, **44(1)**, 135, 1999) (poster).

An injection-locked diode laser for cold Rydberg atom experiments, presented by Margaret Martei ('07) at the JOINT ANNUAL CONFERENCE OF THE NATIONAL SOCIETY OF BLACK PHYSICISTS AND THE NATIONAL SOCIETY OF HISPANIC PHYSICISTS, Boston, MA, February 2007 (poster).

External control of electron temperature in ultra cold plasmas, presented by Roy Wilson (07) at the JOINT ANNUAL CONFERENCE OF THE NATIONAL SOCIETY OF BLACK PHYSICISTS AND THE NATIONAL SOCIETY OF HISPANIC PHYSICISTS, Boston, MA, February 2007 (talk).

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Research Articles (Refereed):

M. G. Boshier, P. E. G. Baird, C. J. Foot, E. A. Hinds, M. D. Plimmer, D.N. Stacey, J. B. Swan, D. A. Tate, D. M. Warrington and G. K. Woodgate, *Precision Spectroscopy of Hydrogen and Deuterium*, *Nature*, **330**, 463 (1987).

D. A. Tate, P. E. G. Baird, M. G. Boshier, E. A. Hinds, D. N. Stacey and G. K. Woodgate, *Fine Structure and Isotope Shift of Tritium in the Balmer - Alpha Transition*, *Journal of Physics B*, **21**, 421 (1988).

L.-G. Wang, D. A. Tate, H. Riris and T. F. Gallagher, *High Sensitivity Frequency-Modulation Spectroscopy With a GaAlAs Diode Laser*, *Journal of the Optical Society of America B*, **6**, 871 (1989).

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D. A. Tate, D. G. Papaioannou and T. F. Gallagher, *Phase-Sensitive Above-Threshold Ionization of Rydberg Atoms at 8 GHz*, *Physical Review A*, **42**, 5703 (1990).

D. A. Tate, D. G. Papaioannou and T. F. Gallagher, *Multiphoton Double Ionization of Barium With Intense Picosecond Pulses*, *Journal of Physics B*, **24**, 1953 (1991).

K. Boyer, A. B. Borisov, O. B. Shiryayev, D. A. Tate, B. E. Bouma, X. Shi, A. McPherson, T. S. Luk and C. K. Rhodes, *Method of Concentration of Power in Materials for X-Ray Amplification*, *Applied Optics*, **31**, 3433 (1992).

D. G. Papaioannou, D. A. Tate and T. F. Gallagher, *Electron Spectroscopy of Single and Double Multiphoton Ionization of Barium by Visible Picosecond Laser Radiation*, *Journal of Physics B*, **25**, 2517 (1992).

T. S. Luk, D. A. Tate, K. Boyer and C. K. Rhodes, *Comparison of Kinetic Energy Distributions and Ionic Fragment Yields of CO₂ and N₂O Arising from Coulomb Explosions Induced by Multiphoton Ionization and Fast Ion Impact*, *Physical Review A*, **48**, 1359 (1993).

J.-M. Flaud, R. Großkloß, S. B. Rai, R. Stuber, W. Demtroder, D. A. Tate, L.-G. Wang and T. F. Gallagher, *Diode Laser Spectroscopy of H₂³⁴S Around 0.82 μm*, *Journal of Molecular Spectroscopy*, **172**, 275 (1995).

D. A. Tate and D. N. Aturaliye (ˆ95), *Hyperfine Structure Intervals and Absolute Frequency Measurement in the 2p⁴ 3s ²P_J - 2p⁴ 3p ²D_J Fine Structure Multiplet of Atomic Fluorine by Diode Laser Spectroscopy*, *Physical Review A*, **56**, 1844 (1997).

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D. A. Tate and J. P. Walton (ˆ98), *Hyperfine Structure Intervals and Isotope Shifts in the 3p⁴ 4s ⁴P_J - 3p⁴ 4p ⁴D_J Fine Structure Multiplet of Atomic Chlorine by Diode Laser Spectroscopy*, *Physical Review A*, **59**, 1170 (1999).

R. M. Jennerich (ˆ00) and D. A. Tate, *Hyperfine Structure Intervals and Isotope Shifts in the 2p³ 3s ⁵S₂ - 2p³ 3p ⁵P_J Fine Structure Multiplet of Atomic Oxygen*, *Physical Review A*, **62**, 042506 (2000).

Wenhui Li, Michael W. Noel, Michael P. Robinson, Paul J. Tanner, Thomas F. Gallagher, Daniel Comparat, Bruno Laburthe Tolra, Nicolas Vanhaecke, Thibault Vogt, Nassim Zahzam, Pierre Pillet, and Duncan A. Tate, *Evolution Dynamics of a Dense, Frozen Rydberg Gas to Plasma*, *Physical Review A*, **70**, 042713 (2004).

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R. M. Jennerich (ˆ00), A. N. Keiser (ˆ02), and D. A. Tate, *Hyperfine structure and isotope shifts in near-infrared transitions of atomic nitrogen*, *European Physical Journal D*, **40**, 81 (2006).

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Conference Proceedings (Not Refereed):

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