Curriculum Vitae *4/11/2023*

John E. Smedley
Address
Department of Physics and Astronomy
Bates College, 44 Campus Avenue
Lewiston, ME 04240-6084
(207) 786-6323 Fax (207) 786-8334
E-mail: jsmedley@bates.edu

Education

B.A. Physics and Chemistry, 1979, Colby College. Phi Beta Kappa; Charles A. Dana Scholar, 9/76-5/79; William A. Rogers Prize in Physics; Chemistry Department Prize; German Book Award; American Institute of Chemists Award; Sigma Pi Sigma

Ph.D. Chemical Physics, University of Colorado at Boulder. University of Colorado Graduate Fellowship, 9/81-5/83; Exxon Foundation Fellowship, 1984; Coblentz Society Award, 1987. Thesis Title: "Laser studies of molecular dissociation by photons and collisions." Thesis Advisor: Stephen R. Leone

Appointments

Chair, Department of Physics and Astronomy, winter & short term 2008; 2009-2014; 2020-2021
Research Associate, Joint Institute for Laboratory Astrophysics, 1987
Assistant Professor of Physics, Bates College, 1987-1994
Associate Professor of Physics, Bates College, 1994-2001
Chair, Program in Environmental Studies, 1995-1999
Professor of Physics, 2001 - present
Visiting Fellow, Joint Institute for Laboratory Astrophysics, 1994-1995

Courses and Units Taught and Developed

Environmental Studies 229: Electric Grids
Environmental Studies 417: Community-Engaged Research in Environmental Studies
Music s27: Exploring Jazz Guitar
Physics 103: Musical Acoustics
BSSP Physics 103: Musical Acoustics – Summer Scholars section, Summer 2011
EXDS 115, 116: Bates Science Fellows
Physics 104: Physics of Electronic Sound
Physics 106: Energy and Environment
Physics 107: Introductory Physics of Living Systems I (redesign)
Physics 108: Introductory Physics of Living Systems II (redesign)
Physics 107-108: Introductory Classical Physics and Modern Physics
Physics 107C: Special section linked to calculus section 105E, Fall 2011
Physics 112: The Physics of Sports
Physics s24: Musical Acoustics
Physics s27: Earth Under Siege: Atmospheric Environmental Problems (with J. Hughes and T. Wenzel)
Physics s30: Electronics
Inds 228: Caring For Creation: Physics, Religion and the Environment (with T. Tracy)
Physics 214: Renewable Energy
Physics 220: Climate Change and Modeling
Physics 231-232: Laboratory Physics
Physics 301: Mathematical Methods of Physics
Physics 315: Acoustics
Physics 361: Thermal Physics
Physics 373: Classical and Modern Optics
Physics 308: Introductory Quantum Mechanics

(courses taught, cont.)
Physics 409: Advanced Quantum Mechanics
Physics 422: Electromagnetic Theory.

Research Interests
My main research interests are atomic and molecular spectroscopy, and in particular, using laser spectroscopic methods to study atomic and molecular collisions. Growing interests related to my teaching include physics related to the environment, especially the fields of renewable energy and climate change. Musical acoustics, particularly spectroscopic studies of percussion and stringed instruments, is another research field related to my teaching.

Memberships
Acoustical Society of America
American Association of Physics Teachers
American Physical Society - Division of Atomic, Molecular and Optical Physics; Div. of Laser Science; Forum on Education; Forum on Science and Society; New England Section; Topical Group on Energy Research and Applications; Topical Group on Physics of Climate

Publications
John Smedley, book review of "Principles of Musical Acoustics," by William M. Hartmann. Physics Today **67**, 46 (September 2014).

John E. Smedley, Sarah K. Coulter, Edward J. Felton and Kayla S. Zomlefer, "Collisional Deactivation of Ba 5d7p $^3D_1$ by Noble Gases," Journal of Physical Chemistry A **112**, 9526-9530 (2008).

Harold V. Parks, Eileen M. Spain, John E. Smedley, and Stephen R. Leone, "Experimental investigation of the initial-state alignment dependence in the energy pooling process: Ca(4s 4p $^3P_1$) + Ca(4s 4p $^3P_1$) → Ca(4s 4p $^1P_1$) + Ca($4s^2$)," Physical Review **A 58**, 2136-2147 (1998).

J.E. Smedley, "Spectrum Analysis for Musical Acoustics," American Journal of Physics **66**, 144-147 (1998).

H.Q. Lorensen, H.V.Parks, E.M. Spain, J.E. Smedley, C.H. Greene and S. R. Leone, "The resonant formation of Ca^+ from the Ca^* (4s25d $^1D_2$) level explained by autoionization through the $3d_{3/2}9f_{5/2}$, J^n=2 resonance," Physical Review **A 54**, 1577 (1996).

J.K. Pribram, J.E. Smedley and M.D. Semon, Post-use review, *Modern Physics for Scientists and Engineers* by J.R. Taylor and C.D. Zafiratos, American Journal of Physics **62**, 189 (1994).

J.E. Smedley, Post-use review, *Principles of Quantum Mechanics* by H.C. Ohanian, American Journal of Physics **61**, 382 (1993).

J.E. Smedley, D.F. Marran,* M.R. Peabody* and C.N. Marquis,* "Electronic energy transfer in Ba 6s8p $^1P_1$ - rare gas collisions," Journal of Chemical Physics **98**, 1093 (1993).

J.E. Smedley and D. F. Marran,* "Radiative lifetimes of the 6s8p $^1P_1$ and near-resonant states in barium," Physical Review A **47**, 126 (1993).

H.C. Miller, K. Yamasaki, J.E. Smedley and S.R. Leone, "An optically pumped ultraviolet laser on SO ($B^3\Sigma^-$-$X^3\Sigma^-$)," Chemical Physics Letters **181**, 250 (1991).

J.E. Smedley, "Laser physics in the undergraduate curriculum," Council on Undergraduate Research Newsletter **X**, 64 (1989).

(Publications, cont.)

J.E. Smedley, H.K. Haugen and S.R. Leone, "Hot band quantum yield of $Br^*(^2P_{1/2})$ in the laser photodissociation of Br_2 from 510-550 nm," Journal of Chemical Physics **87**, 2700 (1987).

J.E. Smedley, H.K. Haugen and S.R. Leone, "Collision-induced dissociation of laser-excited $Br_2(B^3\Pi(0_u^+);v',J')$: Formation of $Br^*(^2P_{1/2})$ + $Br(^2P_{3/2})$ at energies 1-5 kT below dissociation," Journal of Chemical Physics **86**, 6801 (1987).

J.E. Smedley, W.P. Hess, H.K. Haugen and S.R. Leone, "Transient gain-vs.-absorption laser probing of spin-orbit states, kinetics and dynamics," Journal de Chimie Physique **84**, 385 (1987).

J.E. Smedley and S.R. Leone, "Relative quantum yield of $I^*(^2P_{1/2})$ in the tunable laser uv photodissociation of $I\text{-}C_3F_7I$ and $n\text{-}C_3F_7I$: Effect of temperature and exciplex emission" Journal of Chemical Physics **79**, 2687 (1983).

Work in Progress
J.E. Smedley, K.N. LaFortune* and P. Whelan*, “Collision induced absorption in a barium-rare gas vapor.”

*Bates College student co-worker.

Grants
HHMI stipend for redesign of introductory physics sequence during 2019-2020 academic year, $6000.
Learning Associates Program Grant, for guitarist Sheryl Bailey and Music s27, Short Term 2019, $4349
Learning Associates Program Grant, for guitarist Sheryl Bailey and Music s27, Short Term 2013, $2340.
Mellon Grant to develop Physics 107C, a course linked with Math 105E in fall, 2011, $3500.
Learning Associates Program Grant, for guitarist Sheryl Bailey and Music s27, Short Term 2009.
Hughes Medical Institute Curriculum Development Grant, summer 2007, for development of a new course on the physics of sports, $5500.
Ladd Library Grant for holdings in Acoustics, Bates College, 6/22/05, $2500.
Hughes Student-Faculty Research Grant, with Neha Duggar ’06 and Mark Semon, 5/1/04-7/1/04, $4,000.
Hughes Medical Institute Outreach Grant to Central Maine Physics Association, co-sponsor with Jeff Steinert, 9/2003-5/2004, $5000
Hughes Medical Institute Outreach Grant to Central Maine Physics Association, co-sponsor with Jeff Steinert, 1/2003-5/2003, $5000
Hughes Medical Institute Curriculum Development Grant, Bates College, 5/18/01, $3500.
Summer Research Apprentice grant, Bates College, awarded 2/15/00, $3,000.
Hughes Medical Institute Summer Research Grant, Bates College, 1998, $5,000.
Templeton Science and Religion Course Award (with Tom Tracy), for “Caring for Creation” course, 1997, $10,000.
National Science Foundation Instrumentation and Laboratory Improvement Grant #DUE-9552206, “Microcomputer Based Measurement and Simulation for Introductory Acoustics,” 6/26/95-12/26/97, $34,942.
National Science Foundation Research Opportunity Award, for sabbatical research at the Joint Institute for Laboratory Astrophysics, supplement to JILA block grant, August 1994 - July, 1995, $50,000.
Hughes Council, Bates College, Grant for optics workshops for Maine science teachers, March 21, 28, April 11, 1994, $11,039.40.
Council on Undergraduate Research, CURSOR Fellowship (with K.N. LaFortune), Summer, 1993, $3,150.
National Science Foundation Research in Undergraduate Institutions Grant No. PHY-9208013, "Energy transfer in collisions of highly-excited atoms," 9/15/92 - 3/15/96, $90,000.
Maine Mathematics and Science Alliance MERITS Grant, in support of a high school research assistant Maine EPSCOR/MMSA, July-August 1992, $2,750.

(Grants, cont.)

National Science Foundation Instrumentation and Laboratory Improvement Grant No. USE-9251188, "A laboratory for introductory musical acoustics," $35,932, 4/92-9/94.
New England Consortium for Undergraduate Science Education Introductory Physics Project," Mechanical oscillators: From regular to irregular motion," $14,000, 4/92-9/92.
Roger C. Schmutz Faculty Research Grant,"An optically-pumped atomic barium laser." $848, 12/91.
American Chemical Society Petroleum Research Fund Grant #22682-GB6,"Kinetic and spectroscopic studies of energy transfer in atomic collisions." $18,000, 2/1/90 - 8/31/92.
Roger C. Schmutz Faculty Research Grant, $890, 12/89.
Roger C. Schmutz Faculty Research Grant, $1,000, 12/88.
National Science Foundation Instrumentation and Laboratory Improvement Grant USE-851997, "Microcomputer-based undergraduate experiments in laser spectroscopy and atomic collision phenomena." $27,030, 8/88 - 2/91
GTE Foundation Series,"The Laser Revolution in Science, Technology and Society." $4,000, 4/88.
Research Corporation Grant C-2522,"Excitation transfer in laser-excited metal atoms: A kinetic and spectroscopic approach." $19,400, 6/88-6/89.
Roger C. Schmutz Faculty Research Grant, $985, 12/87.

Summer Research Assistants

2018 Gerren Welch, University of Maine Orono student, acoustics research
2004 Neha Duggar, Bates College Hughes Student-Faculty Research
2000 Pramod Khadka, Bates College Summer Research Apprentice Grant
1998 Edward James Felton, Bates College Howard Hughes Medical Institute
1996 Sarah K. Coulter, NSF Research in Undergraduate Institutions
1993 Kai N. LaFortune, CURSOR Fellow, Council on Undergraduate Research
Joshua P. Gray, NSF Research in Undergraduate Institutions
1992 Jeffrey P. Brainerd, NECUSE Introductory Physics
Keith M. Nordstrom, NECUSE Introductory Physics
Kayla Zomlefer (Oxford Hills High School teacher), Dreyfus Foundation
Jonathan Lambert (Deering High School student), MERITS Scholar, Maine Mathematics and Science Alliance
Kai N. LaFortune, NSF Research in Undergraduate Institutions
Preston S. Beach, NSF Research in Undergraduate Institutions
1991 Colin N. Marquis, American Chemical Society - Petroleum Research Fund
1990 Caspar Green, American Chemical Society - Petroleum Research Fund
Diana Van Valen, work study
1989 David F. Marran, Research Corporation
1988 David F. Marran, Research Corporation

Reviews

NSF Research in Undergraduate Institutions proposals
Journals: *Journal of Mathematics & Music; Journal of the Optical Society of America B. Optical Physics The Journal of Physical Chemistry A, ✓ American Journal of Physics*, *Chemical Physics Letters, Perspectives on Science and Christian Faith*
Foundations: NSF Research in Undergraduate Institutions; Petroleum Research Fund B
NSF Review Panel for Course, Curriculum and Laboratory Improvement Program, 2005
NSF Review Panel for Instrumentation and Laboratory Improvement Grants, 1/28-1/31/98
NSF Review Panel for Instrumentation and Laboratory Improvement Grants, 1/11/ -1/14/89

Seminars and Panels

WTF?! Bates Scientists on Government Censorship of Science, Bates College, November 13, 2017
First Generation to College panel, November 18, 2014
Martin Luther King, Jr. Day panel, "Carbon Denial: What is at Risk?" January 16, 2012
Parents' Weekend Faculty Symposium, "Liberal Arts Confluence: Examining Ideas from Different Perspectives," October 9, 2011.
Tools for Teaching the New Curriculum: "Engaging Students," 2/11/2008
Bates faculty panel, "Small is Beautiful but Big is Doable," on pedagogy, 11/8/2006
Environmental Governance and Energy at Bates College, Moderator, Chase Lounge, 4/1/2004
Panel Discussion, "A Conversation with David Abram," Chase Lounge, Bates College, November 4, 2003
Panel presentation, "Terror and Peace in the 21st Century – A Panel on Scientific Resposibility and Ethics," with Chris Gray, Frank Chessa and Bonnie Shulman, 2/4/2003
Bates faculty seminar, "Building two-way streets: Women's Studies and scientific content," 9/98-5/99.
Bates faculty seminar, "Building two-way streets: Women and Science," 9/97-5/98.
Panel presentation, "Emerging connections within science," Bates College, October 10, 1992.
Women's Studies Faculty Development Seminar, "Gender and Science," 9/92-5/93.

Abstracts and Poster Presentations

John E. Smedley, "Energy, environment and electric grids," poster presentation at Gordon Research Conference on Physics Education and Research, Bryant University, June 10-15, 2018.

S. Sharif* and J. E. Smedley, "Experimental studies of collision-induced absorption in a barium-rare gas vapor," Mount David Summit, Bates College, 3/30/03

P.S. Khadka* and J.E. Smedley, "Relative rates for fine-structure changing collisions of Ba 5d7p $^3D_1$ with helium," Student Research Symposium, Bates College, 5/01

J.E. Smedley, S.K. Coulter*, E. J. Felton* and K. Zomlefer, "Collisional deactivation of Ba 5d7p $^3D_1$ by rare gases," New England Section of the American Physical Society Fall Meeting, Colby College, November 6, 1999.

J.E. Smedley, Poster on "The environmental studies major at Bates," and "Caring for Creation," Maine Global Change Conference, Lewiston, Maine, April 7, 1999.

P.T. Whelan*, K.N. LaFortune*, and J.E. Smedley, "Collision induced absorption in a barium-rare gas vapor," Gordon Conference on Atomic Physics, New England College, June 29-July 4, 1997.

P.T. Whelan* and J.E. Smedley, "Collision induced absorption by barium-helium complexes," New England Section of the American Physical Society Spring Meeting, April 11-12, 1997, University of Maine, Orono.

John E. Smedley, Sarah K. Coulter*, and Kayla Zomlefer, "Energy transfer in Ba(5d7p) $^3D_1$ - rare gas collisions," poster presentation at Gordon Conference on Atomic and Molecular Interactions, Colby-Sawyer College, June 30-July 4, 1996

K. Corwin, Z-T. Lu, J. Smedley, C. Wieman, T. Dinneen, and H. Gould, "Toward Trapping ^{221}Francium Atoms," Gordon Research Conference on Atomic Physics, 3-7 July, 1995.

H.Q. Lorensen, H. Parks, J. Smedley, E. M. Spain, S. R. Leone, "Alignment and state dependence on resonant formation of Ca-ions from Ca(4s25d ^{1}D + Ca collisions," Division of Atomic, Molecular and Optical Physics of the American Physical Society Meeting, Toronto, Ontario, Canada, 17-19 May, 1995.

(Abstracts, cont.)

J.E. Smedley, J.P. Gray*, J.P. Brainerd*, K.N. LaFortune*, K. Zomlefer, "Collisional and radiative properties of highly-excited barium atoms," International Conference on Atomic Physics XIV, 1Q-8, Boulder, Colorado, August 2, 1994.

K.N. LaFortune*, J.Gray*, and J.E. Smedley, "Energy transfer in Ba 6s7d $^3D_2$ - rare gas collisions," Fall Meeting of the New England Section of the American Physical Soc., Amherst College, October 15-16, 1993.

J.E. Smedley, K. Zomlefer, K.N. LaFortune*, D.F. Marran*, C.N. Marquis*, M.R. Peabody*, "Collisional and radiative properties of highly excited levels in barium," DAMOP Meeting, Reno, NV, 16-19 May, 1993.

J.E. Smedley, "Spectrum analysis in introductory musical acoustics," Conference on the Introductory Physics Course, Rensselaer Polytechnic Institute, 20-23 May, 1993.

J.P. Brainerd*, J.E. Smedley, and C.N. Marquis*, "An optically pumped atomic barium laser on 6s8s $^1S_0$ – 6s6p $^3P_1$ at 460.0 nm," New England Section of the American Physical Society, Williams College, 2-3 April, 1993.

C.N. Marquis* and J.E. Smedley, "Collisional spectroscopy of energy transfer from Ba(6s8p)^{1}P," Fall Meeting of the New England Section of the American Physical Society, Bates College, 1991, Bulletin of the American Physical Society.

J.E. Smedley, D.F. Marran* and M.R. Peabody,* "Energy transfer in Ba (6s8p)^{1}P Collisions," Bulletin of the American Physical Society, **36**, 1378 (1991).

J.E. Smedley, H.K. Haugen and S.R. Leone, "Laser studies of photo- and collisional dissociation of Br_2," Bulletin of the American Physical Society, **32**, 1254 (1987).

J.E. Smedley, H.K. Haugen and S.R. Leone, "Collisional release of Br_2," XVII Informal Conference on Photochemistry **Mon-16**, Boulder, CO 22-26 June (1986).

J.E. Smedley, H.K. Haugen and S.R. Leone, "Collisional release of Br_2," Forty-first Symposium on Molecular Spectroscopy **FB5**, Ohio State University, 16-20 June (1986).

J.E. Smedley and S.R. Leone, "Relative quantum yields of excited I($^2P_{1/2}$) atoms in the ultraviolet photodissociation of I-C_3F_7I and n-C_3F_7I," American Chemical Society, 185th National Meeting, Seattle, WA 20-25 March (1983).

*Bates College student co-worker

Senior Theses Advised (for the Physics major, unless otherwise noted).

✓ "An Assessment of the Environmental Effects of High-Efficiency Affordable Housing in Lewiston, Maine," Gabrielle Brewer (Environmental Studies), 2023.
✓ "An Introduction to Radar Positioning Systems," Timothy Brennan Bates, 2023.
✓"Tidal Energy in Cobscook Bay: An Analysis of Tidal Range Energy and Tidal Barrage Generation Paradigms," Liam Daly-Smith, 2023.
✓"Exploring Millimeter Wave Drilling for Geothermal Energy Extraction," Samuel Delamere, 2023.
"Wind Energy: A Physical and Fiscal Overview," Gabe Salvi, 2021
"Investigation and Experimentation of Basic Photovoltaics," Caleb Eklund, 2021
"Offshore Wind Farm Siting Optimization in the Gulf of Maine," Alex Brovender, 2021.
"The Future of Nuclear Reactors: Generation IV – Fusion," Juliana Martino, 2021.

(Theses, cont.)

“Aerodynamic Impact of Ice Accretion,” Armaan Mecca, 2021.
“Solar Efficiency,” Ryan Nealis, 2021.
“Maine’s High School Physics Curriculum: The Benefits of Arduino,” Tyler Simmons, 2021.
“The Future of American Offshore Wind Energy: An Environmental and Economic Analysis,” Oliver Wan (Environmental Studies), 2021
”Triboelectricity: An Update on Electron Transfer Theory and Applications,” Dinos Lefkaritis Jr., 2020.
”Measuring Force Profiles on the Rowing Ergometer,” Hannah Fitts, 2020.
”Dual Impulse Response Measurements for the Auralization of Room Acoustics,” Max Rolnick, 2020.
“Modeling Nationally Determined Contributions to the Paris Climate Accord,” Ezekiel Smith (Environmental Studies), 2019.
“Source Specific Sky Glow Contributions from LED Road Lines,” Alexis Hudes, December 2019.
”Analysis of Harmonic Distortion from Electric Vehicle Chargers” Owen Ahlborn, 2019.
”Hybrid Distributed Electricity Generation, Sustainable Heat, and the City of the Future:
A Feasibility Study of Renewable Energy in Lewiston, Maine,” Haley Crim (Honors, Environmental Studies), 2019.
”The Urban Heat Island Effect,” Julian Stolper, 2018.
”Acoustic Levitation,” Milan Brankovic, 2017.
”Making the Grasses Greener: A Look at the Historic and Present Use of Pesticides at Bates College, Lewiston, ME,” Nora Stoner (Environmental Studies), 2017.
”Mitigating Greenhouse Gases Through Biogas Utilization and Cogeneration in Municipal Wastewater Facilities,” Desirae Valentin, 2017.
“Viability of Concentrator Photovoltaics for Electricity Production in the United States,” John Dina, 2016.
”An investigation of the extent to which climate change induced factors have catalyzed the American Lobster’s (Homarus Americanus’) macroecological range shift northward in the Northern Atlantic Ocean,” Jessica Wilson (Environmental Studies), 2016.
”The Artificial Leaf: Solar-Driven Hydrogen Production,” (John) Forrest Naylor, 2016.
”Biodiesel at Bates? A Feasibility Study for the Implementation of Biodiesel in Bates College Fleet Vehicles,” Nick Ford (Environmental Studies), 2015.
“Guitar String Resonance and Decay,” Alexander Bennett, 2015.
“Residential Energy Efficiency Retrofits: Recommendations for a Case Study in Lewiston, ME,” Kate Paladin (Environmental Studies), 2014.
“Seismoelectric Waves,” Alex Francis, 2014.
“An Evaluation of the Ecological Effects of Wind Powered Facilities on Bat Fatalities in the United States,” Rakey Drammeh (Environmental Studies), 2014.
“A Sustainability Assessment of Bioenergy as a Potential Primary
Energy Source for Maine and Bates College,” Catherine Dioli (Environmental Studies), 2014.
“Effect of Blade Pitch Angle for Vertical Axis Helical Tidal Turbines,” Coleman Lieb, 2013.
”An Environmental Assessment of Energy Biomass for Bates College and Environmental Implementation Recommendations,” Katrina Orlov (Environmental Studies), 2013.
”Campus Sustainable Food Movements: Bates College Case Study and Application,” Anna McCabe (Environmental Studies), 2013.
”Design of a Small-Scale Wave Energy Converter, Austin Guyette, Fall 2012.
”Sustainable Design: Integrated Reexamination,” Erik Barth (Environmental Studies), 2012.
”Modeling Cloud Growth,” Michael Dorfman, 2012.
”Investigation and Analysis of the Solar Chimney,” Sean McGowan, 2010.
“The Flux Compression Generator,” Kevin Patrick Foster, 2009.
”Breaking the Black Box. An Introduction to the Fundamentals of Climate Modeling,” John Murphy, 2008.
”Trumpet Acoustics,” William Davies III, 2008.
“Assessing and Reducing Bates’ Greenhouse Gas Emissions,“ David Rosenzweig, 2007 (Environmental Studies)
“Exploring the Economic and Energy Potentials of Hydrogen Fuel,” Gregory Sinche, 2007.
”An Experimental Approach to Bessel Functions,” Neha Duggar, 2006

(Theses, cont.)

”Keeping ME Warm: Practicality of Photovoltaic Systems and Solar Space Heating in Maine,” Thomas Lucey, 2005
“The Acoustic Impedance of the Trombone,” Aaron Lee, 2005
“Windmills: Their Importance in Today’s Society and the Physics that Governs their Operation,” Kimberly Hoffman, 2004
“Green Design: A comparison of case studies,” Noah Tuthill, 2003 (Environmental Studies).
“An Experimental Study of Collision-Induced Absorption in a Barium-Rare Gas Vapor,” Sonia Shariff, 2003 (Chemistry).
“Acoustic Analysis of a Javanese Slentham,” Jesse Fox, 2003.
“Theory and Testing of a Monolithic Photovoltaic-Photoelectrochemical Device for Hydrogen Production via Water Splitting,” Thaddeus Curtz, 2003.
“Focusing on education: Green architecture meets Bates College,” John Daniel Lichtman, 2002 (Environmental Studies).
“Estimation of rate constants for near-resonant states of 5d7p $^3D_1$ in barium,” Pramod Singh Khadka, 2002.
“The Vibration of Thin Plates,” Mark David Fowler, 2001.
“Vowel Formant Production by Mechanical Acoustic Filters,” Jonathan Thomas Cresswell, 2001.
“Electronic energy transfer in Ba (5d7p) $^3D_1$ rare gas collisions,” Edward J. Felton, 1999, Honors.
“An analysis of solar-driven natural convection energy conversion systems,” David W. Weir, 1999, Honors.
“The theory and design of a two-way electrodynamic loudspeaker,” Daniel A. Ritts, 1998.
“An examination of the amplification of a double bass using piezoelectric pickups,” Timothy D. Moynihan, 1997.
“Collision-induced absorption by barium-helium complexes,” Peter Whelan, 1997.
“Construction of an analog synthesizer,” John David, 1996.
“Fourier Transform Profilometry,” James Burke, 1996.
“Radiative and collisional properties of barium (5d7p) $^3D_1$, Sarah K. Coulter, 1996 (Chemistry).
“Temporal Bell Inequalities,” Sunshine Mathon, 1995 (jointly advised by Mark D. Semon).
"Collisional energy transfer in the 6s7d ^3D multiplet of barium," Joshua P. Gray, 1994.
"The acoustics of the hammered dulcimer," M. Sullivan, 1994.
"Construction of an optical parametric oscillator with BBO," K.N. LaFortune, 1994.
"An optically-pumped barium vapor laser on 6s8s $^1S_0$ □ 6s6p $^3P_1$," Jeffrey P. Brainerd, 1993, Honors.
"Nonlinear optical phase-conjugation by degenerate four-wave mixing," Andrew K. Dunn, 1992, Honors.
"Laser studies of collisional energy transfer in the barium - rare gas atom system," Colin N.Marquis, 1991.
"Fourier transform profilometry: A method of automatic measurement of 3-d shapes," Carl F.Fey, 1990.
"Building an automatic laser frequency-doubling device," Jonathan M. Roberts, 1990.
"Microscopic and interferometric studies on the optical properties of sapphire crystals,"Julie A. Englund, 1990.
"Laser studies of collisional energy transfer in alkaline metal - rare gas systems," Mark R.Peabody, 1990, Honors.
"Laser studies of state-resolved collisional energy transfer in the excited barium - rare gas atom system," David F. Marran, 1989, High Honors.
"Laser Doppler velocimetry analysis of radial dependence in fluid flow," James M. Puiia, 1988.
"The Sagnac interferometer," Carrie Chirolas, 1988.
"Optical third harmonic generation: An introduction," Bruce Y. Kozuma, 1988.
"Hull design, a study in two dimensions," Langely Gace, 1988.
"An examination of the absorptive and reflective spectra of rubidium," Craig T. Evenson, 1988.

Talks

”Science and Religion: From Conflict to Dialog,” (with Tom Tracy), Glencoe Union Church, Glencoe, IL, May 8, 2014.

”Lightbulbs 101,” Envirolunch, February 13, 2013.

“The Earth's surface temperature and efforts to slow its growth,” Envirolunch, February 9, 2012.

”Sounding Off on Musical Acoustics,” Parents Symposium, Bates College, October 9, 2010.

“Stella James, Class of 1897,” A Diverse History--Race, Class and Gender at Bates College in the 19th Century, Muskie Archives, Bates College, May 12, 2010.

Presentation on renewable energy and the Bates Climate Action Plan, for the Boston Bates Business Network, Boston, MA, March 18, 2010.

”Bates Climate Action Plan,” Bates Trustees Infrastructure Committee, January 29, 2010.

“Physics of a Curveball,” First annual meeting of coaches and faculty liaisons, Bates College, May 17, 2006.

”Physics and Music,” – Fall Meeting of the New England Sections of the American Physical Society and American Association of Physics Teachers, Bates College, October 3, 2003.

“Terror and Peace in the 21st century - A Panel on Scientific Responsibility and Ethics,” with Frank Chessa, Chris Gray and Bonnie Shulman, Bates College, February 4, 2003.

“Physics Inside and Out,” American Association of Physics Teachers meeting, Bates College, Nov. 3-4, 1995.

"The physics of musical acoustics," Joint Institute for Laboratory Astrophysics, University of Colorado, April 28, 1995.

"Collisional and radiative properties of highly excited barium," Chemical Physics Colloquium, JILA, University of Colorado, October 14, 1994.

"Teaching at a liberal arts college," JILA, University of Colorado, September 13, 1994.

“Spectrum analysis in introductory musical acoustics,” Maine Association of Physics Faculty Annual Meeting, Colby College, April 30, 1994.

"Mechanical oscillators: From regular to irregular motion ,"New England Consortium for Undergraduate Science Education Introductory Physics Group Meeting II, Smith College, October 23, 1992.

"Mechanical oscillators: From regular to irregular motion," New England Consortium for Undergraduate Science Education Introductory Physics Group Meeting I, Bowdoin College, May 2, 1992.

"Time-resolved emission spectroscopy in the undergraduate curriculum," Maine Association of Physics Professors Annual Meeting, Orono, ME, 27 April, 1991.

"Laser studies of energy transfer in atomic collisions," Colby College, 5 May, 1991.

"Energy transfer in collisions of excited barium atoms," Physics department colloquium, Wesleyan University, 30 November .

"The physics curriculum at Bates College," New England Consortium for Undergraduate Science Education Meeting on Physics Curricula, Wellesley College, October 21, 1989.

"Energy transfer in barium - helium collisions," Bates College, Fall 1989.

"Laser studies of energy transfer in atomic collisions," Physics department colloquium, Amherst College, 26 April, 1989.

"Energy transfer in atomic collisions," Faculty Luncheon Seminar, Bates, October, 1988.

"Pounding the light out of atoms," Physics Department Colloquium, Bates College, September, 1987.

"Laser studies of photoprocesses in bromine," Physics Department Colloquium, Bates College, January 28, 1987.

Extracurricular Services to the College

I. College Committees

Internal committee, Sociology Department Review

Leadership Team, Science Fellows, Howard Hughes Medical Institutes grant, 2018-2020

Board of Examiners, elected 2018-2021

Open Rank position in STEM Search, 2017-2018

Philosophy Search, 2016-2017

Computational Neuroscience Search, 2016-2017

BobcatFirst pre-orientation session, August 21, 2016

(Committees, cont.)

Environmental Geophysics Lecturer Search, 2016
Physics Department Tenure Track (2) Search, 2015-2016.
Curriculum Review Committee, 2015 –present; chair fall 2017-present
Calendar Task Force, 2014-2015
Campus Avenue Project Steering and Infrastructure Committees, 2013-2014
Search Committee, Director of Office of Diversity and Equity Resources, 2012-2013
Anthropology Department Review Committee, 2012
Search Committee, Director of Office of Diversity and Equity Resources, 2011-2012
Classical and Medieval Studies Review Committee, 2010-2011
EOE/AA Task Force, 11/2010- 5/2011
Environmental Studies Program Committee, 1995-1999 (chair), 2010-present
Benefits Task Force, 8/2010- 8/2011
Economics Department search committee, 2009-2010
Equipment Advisory Group, 9/2008-present
Men's Basketball Liaison, 2008-present
Chair, Committee on Environmental Responsibility, 2007-2015
Curriculum and Calendar Committee, 2005-2009
Co-Chair, Environmental Coordinator Search Committee, 11/2005-4/2006
Graduate Fellowships Committee, 10/2005 – 5/2006
Chair, Environmental Task Force, 5/2004 – 9/2007
Asheville Group, reviewing general education program, 5/2003 – 5/2004
Chair of Interdisciplinary Programs, 2002 -2006
Committee on Personnel, September 2000 – May 2001, September 2002 – May 2003
Program in Environmental Studies Committee, Chair, 1995-1999
Committee for the Music Department review, 1999
Environmental Confederation, 1997-1999
Environmental Coordinator Search Committee, Summer 1997
Education Department Search Committee, September 1996
Otis Memorial Fund Committee, March 1996
Shortridge Planning Committee, March 1996
Chair, Committee for the review of the Program in Women's Studies, 1995-6
Junior Advisor Selection Committee, 2/94
Librarian Search Committee, 12/94 - 3/95
Faculty Committee in Conference with the Trustees, 5/92 - 5/94, 9/95 – 97.
Environmental Studies Task Force, October 1992 - May 1994
Hughes Council, September 1991 - May 1994; Sept. 1995-May 1996
Dean of Faculty/Vice President for Academic Affairs Search Committee, September 1990 - April 1991.
Committee on Environmental Issues, September 1990 - 1997
Teaching Development committee, September 1988 - May 1990.
Committee on Admissions, September 1988 - May 1993; Chair, September 1992 - May 1993.

II. Other service to the College

"Musical Acoustics," Master Class for Accepted Students, October 14, 2019.
"Musical Acoustics," Master Class for Accepted Students, April 5, 2019.
"Musical Acoustics," Master Class for Accepted Students, October 8, 2018.
"Musical Acoustics," Master Class for Accepted Students, April 23, 2018
"Musical Acoustics," Master Class for Accepted Students, April 24, 2017.
"Visualizing Sound," Master Class for Accepted Students, April 8, 2016.
Presidents' Summit on Sustainability and Economic Development, University of Maine, June 25, 2014
Summer adviser to incoming first-year students, 2009, 2010
Advisor, Environmental Coalition, 3/92-5/94.

(Service, cont.)

Advisor, Society of Physics Students, 1987 - 2002
Outstanding Chapter Award, 1988-9 and 1990-1.
Coordinated visit of Clarice Yentsch, Research Scientist and Educator at Bigelow Laboratory, lecture on "The woman scientist: Meeting the challenges"
Coordinated visits of industrial researchers in physics:
Donald Cox, Exxon Research and Engineering, Feb. 12, 1996
Robert Leheny, Bellcore , January, 1993; Bernie Silbernagel, Bell Labs, January 16, 1992
Marek Zielinski, Clairol, February 27, 1991
Coordinated "Renewables are ready," program on energy conservation and renewable energy sources, Bates College, March 16 and 23, 1992.
Coordinated "The billion lb. diet week of education," Bates College, October 22-26, 1990.
Coordinated "Global warming week of education," Bates College, November 1-9, 1989.

Meetings Attended
Howard Hughes Medical Institute PIC meeting, Warren Center, Framingham State University, June 12-14, 2019
Gordon Research Conference on Physics Education and Research, Bryant University, June 10-15, 2018
Physics of Sustainable Energy II, University of California, Berkeley, CA, March 5-6, 2011
Sustainable Energy Conference, Chewonki Foundation, Wiscasset, ME, April 26, 2008
”American Physical Society Short Course on Sustainable Energy,” University of California, Berkeley, CA, March 1-2, 2008
”New England Climate Impacts (web) Seminar,” Union of Concerned Scientists, January 18, 2007.
”Toward Zero Energy Homes, workshop, Maine Chapter, United States Green Building Council, Portland, Maine, February 10, 2006.
13th Institute on General Education, Association of American Colleges and Universities, Asheville, North Carolina, May 30 – June 4, 2003.
Spring Meeting of the New England Sections of the American Physical Society and American Association of Physics Teachers, Williams College, April 11&12, 2003.
Physics Department Retreat, August 29&30, 2002.
New England Board of Higher Education meeting on environmental internships, Portland, Maine, October 4, 1997
Templeton Foundation Workshop on Courses in Science & Religion, Gordon College, Wenham, MA, June 7-11, 1996
North East Environmental Studies Directors Meeting, Saranac Lake, NY, September 13-14, 1996.
New England Section of the American Physical Society Spring Meeting, MIT, April 26-7, 1996.
Maine Solar Energy Conference, Bates College, Feb.3, 1996 (co-organizer).
New England Section of the American Physical Society Fall Meeting, Bowdoin College, October 6-7, 1995.
Society of Physics Students National Congress, College Park, Maryland, Sept. 28-Oct.1,1995.
North East Environmental Studies Directors’ Meeting, Moosilauke, New Hampshire, Sept. 22-23, 1995.
Council on Undergraduate Research National Meeting, Bates College, June 25-7, 1994.
North East Environmental Studies Directors' Meeting, Colby College, October 22-23, 1993.
Society of Physics Students National Congress, Arlington, Virginia, Sept. 30-Oct. 2, 1993.
New England Consortium for Undergraduate Science Education Meeting on Modern Optics, Williams College, September 20 - 21, 1991.
Council on Undergraduate Research, National Councilors' Meeting, University of Richmond, June 13 - 15, 1991.
New England Consortium for Undergraduate Science Education Meeting on Modern Optics, Bates College, June 4 - 5, 1991.
Workshop for teachers of musical acoustics, led by Thomas Rossing, Baltimore and Annapolis MD, May 3-4, 1991

(Meetings, cont.)

Catgut Acoustical Society, International Symposium on Musical Acoustics, Annapolis, Maryland, May 3 - 5, 1991.
New England Consortium for Undergraduate Science Education Conference on Modern Optics, Yale University, October 12 - 13, 1990.
Gordon Conference on Atomic and Molecular Interactions, Salve Regina College, July 29 - August 3, 1990.
Gordon Conference on Molecular Energy Transfer, Brewster Academy, July 10 - 14, 1989.
Gordon Conference on Atomic and Molecular Interactions, Plymouth State College, August 1 - 5, 1988.
Council on Undergraduate Research National Meeting, Carleton College, July 13 - 14, 1988.
Gordon Conference on Molecular Energy Transfer, Brewster Academy, August 1985.
International Conference on Radiationless Transitions, Newport Beach, California, January 1983.
American Chemical Society National Meeting, Las Vegas, Nevada, September 1982.

Extracurricular Services to the Greater Community
Member, Lewiston Energy Savings Committee, 2008 - 2012
Faculty in Mathematics and Science Academy at Bates, units on “Motion and Energy” and “Matter,” sponsored by the Maine Mathematics and Science Alliance, June 22 - July 2, 1999
Workshop on musical acoustics for Bath high school students, April 14, 1999.
Faculty in Mathematics and Science Academy at Bates, units on “Motion and Energy” and “Matter,” sponsored by the Maine Mathematics and Science Alliance, July 14-18, 1998
Faculty in Mathematics and Science Academy at Bates, developed module on “Motion and Energy,” sponsored by the Maine Mathematics and Science Alliance, July 14-18, 1997.
Presentation on “The Physics of Music,” Auburn Public Library, Auburn, Maine, Feb. 28, 1998
Acoustics lab with MERITS high school students, Bowdoin College, May, 1996.
Beacon College Workshop on Musical Acoustics, Bates College, March 25, 1996
“Physics Inside and Out,” program for 8th grade girls, Bates College, August 6-12, 1995.
Faculty in 1994 Math and Science Academy at Bates, developed modules on optics, acoustics, and mechanics.
Optics workshops for Maine science educators, March 21, March 28, and April 11, 1994, funded by Howard Hughes Medical Institute grant to Bates College
Physics of Musical Instruments," Instrumentation Days session for high school teachers and students, 11/5/93.
Faculty in 1993 Math and Science Academy at Bates, developed module on "Energy and Energy Flow," sponsored by the Maine Mathematics and Science Alliance, July 11-15, 1993.
"Exploring Light," Hughes outreach program with junior high and high school students and teachers, Bates College, Nov. 8, 1991.
"A look at light" presentation during "Opening Doors: A day of science exploration for junior high school girls," March 5, 1991.
Coordinated mentors program, matching gifted Lewiston Junior High School science students with Bates students and faculty, Fall, 1989.
Elementary school presentations on light and lasers:
Pettingill Elementary School, October 1995, April 1999.
Yarmouth Elementary, Yarmouth, ME, April 1991, 1990.
Wallace School, Lewiston, ME November 13, 1990.
Tolland Elementary, Tolland, CT, October 1989.

Musical Compositions

Wes' Tune (1977)
Morning Song (1977)
Alisong (1979)
If We Live (1993)
Side by Side (1993)
Every Knee Should Bend (1993)
Rejoice in the Lord (rock tune - 1993)
Grace to You and Peace (1993)
Nos. 1 and 2 (1993)
Amen No. 1 (1993)
Amen No. 2 (1993)
Make a Joyful Noise (1993)
Magnificat (1993)
Psalm 29, untitled (1994)
I Am Still With You (1994)
Trust In God at All Times (1994)
The Prophet (1994)
Praise! (1994)
Gather My Faithful (1994)
May My Words Give Praise (1994)
Psalm 4, untitled (1994)
Psalm 23, untitled (1994)
Be Around (1994)
I Believe in the Holy Spirit (1995)
O Lord, Our Sovereign (1995)
An Offertory Prayer (1996)
Song of dedication for Andrew Avram (1996)
Sing your hearts out to God (1996)
God of love (1996)
Come to the Table (with David Wood, 1996)
Magnificat (1996)
Our Purpose (1997)
God's Love is Like a Song (1997)
Let the Words of My Mouth (1997)
We Live by Faith (1997)
Song of Hope (1997)
Love is the Final Word (13 June 1997)
Know What, Daddy? (1999)
Waltz for Carole (2001)
Blues for Epaphroditus (2001)
Euodia and Synthyce (2001)
Rejoice in the Lord (jazz waltz – 2001)
Blues for Ian (2001)
Thanksgiving Song (2001)
Ode to Blues (Beethoven's Ode to Ann) (2003)
GenEd Blues (2003)
Linda (2003)
Mr. MR (2003)
Rosie (2004)
Isosceles (2004)
Boules for Jules (2007)
Earth Blues (2008)
Mary's Theme (2010)
Tears for Holly (2010)
Dream Blues (2014)
West to East (2014)
Baap-Du-Zschwee (2015)
Eclipse (2015)
Five Rooms (2015)
✓ Labyrinth (2023)

Musical Performances (since July 1, 2022)
Private wedding, July 16, 2022, Oxford, ME (solo)
Black Point Inn Jazz Night, July 19, 2022, Scarborough, ME (with Delta Kings rhythm section)
Lewiston Public Library Art Walk, August 26, 2022, Lewiston, ME (with Dale Chapman & Tim Clough)
Bates Holiday Party, December 21, 2022, Lewiston, ME (with Larry Williams, Dale Chapman, Tim Clough & Michael Hansen)
Oasis at Trinity Episcopal Church, November 9, 2022, Lewiston, ME (with Tim Clough)
LA Arts Grand Opening, February 18, 2023, Lewiston, ME (with Dale Chapman, Tim Clough & Michael Hansen)
Oasis at Trinity Episcopal Church, April 5, 2023, Lewiston, ME (with Tim Clough)