

VITA
(May 2011)

JOSEPH WILFRED GANEM

Department of Physics
Loyola University Maryland
4501 N. Charles Street
Baltimore, MD 21210

Office: 410-617-2048
Fax: 410-617-2646
E-mail: Ganem@loyola.edu
Website: <http://www.JosephGanem.com>

Date of Birth: June 1, 1959

Place of Birth: Detroit, Michigan

**Fields of
Specialization:** Condensed Matter Physics, Optical Properties of Materials,
Lasers, Nuclear Magnetic Resonance, Quantitative Literacy

Degrees: B. S. Physics, University of Rochester, 1981
M. S. Physics, University of Wisconsin-Madison, 1984
Ph.D. Physics, Washington University in Saint Louis, 1989

Ph.D. Thesis: "Deuteron Magnetic Resonance Studies of Condensed HD/n-D₂ Mixtures and HD in Solid Argon," Supervisor: Richard E. Norberg.

POSITIONS

Professor of Physics, Department of Physics, Loyola University Maryland (formerly Loyola College in Maryland), Baltimore, MD, 2008 - present.

Associate Professor of Physics, Department of Physics, Loyola College in Maryland, Baltimore, MD, 2000 - 2008.

Assistant Professor of Physics, Department of Physics, Loyola College in Maryland, Baltimore, MD, 1994 - 2000.

Office of Naval Technology Postdoctoral Fellow, Laser Physics Branch, U. S. Naval Research Laboratory, Washington, DC, 1992 - 1994.

Postdoctoral Research Associate, Department of Physics and Astronomy, University of Georgia, Athens, GA, 1989 - 1992.

Research/Teaching Assistant, Department of Physics, Washington University, Saint Louis, MO, 1984 - 1989.

Research/Teaching Assistant, Department of Physics, University of Wisconsin, Madison, WI, 1982 - 1984.

Accelerator Technician, Nuclear Structure Research Lab, University of Rochester, Rochester, NY, 1981 - 1982.

Research/Teaching Assistant, Department of Physics and Astronomy, University of Rochester, Rochester, NY, 1979 - 1981.

PUBLICATIONS

Peer Reviewed Journals

- Daniel Howse, Michael Logie, A. G. Bluiett, S. O'Connor, N. J. Condon, Joseph Ganem, and S. R. Bowman, "Optically-pumped mid-IR phosphor using Tm^{3+} -sensitized Pr^{3+} -doped KPb_2Cl_5 ," *Journal of the Optical Society of America B*, **27**, 2384-2392(2010).
- Joseph Ganem, "Quantitative Reasoning Applied to Modern Advertising," *The International Journal of Science in Society*, **1**, 87-96 (2009).
- A. G. Bluiett, N. J. Condon, S. O'Connor, S. R. Bowman, Michael Logie, and Joseph Ganem, "Thulium-sensitized neodymium in KPb_2Cl_5 for mid-infrared laser development," *Journal of the Optical Society of America B*, **22**, 2250-2256(2005).
- N. W. Jenkins, S. R. Bowman, S. O'Connor, S. K. Searles, and Joseph Ganem, "Spectroscopic characterization of Er-doped KPb_2Cl_5 laser crystals," *Journal of Optical Materials* **22** 311(2003).
- Joseph Ganem, Jennifer Crawford, Paul Schmidt, N. W. Jenkins, and S. R. Bowman, "Thulium Cross-Relaxation in a Low-Phonon Energy Crystalline Host," *Physical Review B* **66** 245101(2002).
- Joseph Ganem, Jennifer Crawford, N. W. Jenkins, and S. R. Bowman, "Endothermic Cross Relaxation in Tm^{3+} -Doped YCl_3 ," *OSA Trends in Optics and Photonics Vol. 50, Advanced Solid State Lasers*, Christopher Marshall ed. (Optical Society of America, Washington, DC 2001).
- S. R. Bowman, S. K. Searles, N. W. Jenkins, S. B. Qadri, E. F. Skelton and Joseph Ganem, "Diode pumped room temperature 4.6 micron erbium laser," *OSA Trends in Optics and Photonics Vol. 50, Advanced Solid State Lasers*, Christopher Marshall ed. (Optical Society of America, Washington, DC 2001).
- Joseph Ganem, Paul Schmidt, and Steven Bowman, "Cross Relaxation in a Tm^{3+} -Doped Low-Phonon energy Laser Material," *OSA Trends in Optics and Photonics Vol. 34, Advanced Solid State Lasers*, Hagop Injeyan, Ursula Keller, and Christopher Marshall eds. (Optical Society of America, Washington, DC 2000) p. 536-541.
- S. R. Bowman, S. K. Searles, Joseph Ganem, and Paul Schmidt "Further Investigations of potential 4 micron laser materials," *OSA Trends in Optics and Photonics Vol. 26, Advanced Solid State Lasers*, Martin M. Fejer, Hagop Injeyan, Ursula Keller eds. (Optical Society of America, Washington, DC 1999) p. 487-491.
- S. R. Bowman, L. B. Shaw, S. Searles, B. J. Feldman, Sean, M. Kirkpatrick, Joseph Ganem, I. Gambaryan, T. Sanamyan, and E. Vartanyan, "Investigation of a potential mid-infrared erbium laser," *OSA Trends in Optics and Photonics, Vol. 19, Advanced Solid State Lasers*, eds. Bosenburg and Fejer (Optical Society of America, Washington DC, 1998) p. 534-538.
- Joseph Ganem, "A Behavioral demonstration of Fermat's Principle," *The Physics Teacher*. **36**, 76-78(1998).
- Sean M. Kirkpatrick, L. B. Shaw, S. R. Bowman, S. Searles, B. J. Feldman, and Joseph Ganem, "Mid-infrared spectroscopy of erbium doped chloride laser crystals," *Optics Express*, **1**, 78-86(1997).
- Sean M. Kirkpatrick, S. R. Bowman, L. B. Shaw, and Joseph Ganem, "Cross relaxation and upconversion coefficients of the mid-infrared transitions of $\text{Pr}^{3+}:\text{LaCl}_3$," *Journal of Applied Physics*, **82**, 2759(1997).

- L. B. Shaw, S. R. Bowman, B. J. Feldman, and Joseph Ganem, "Radiative and Nonradiative Transition Rates of Pr³⁺ in LaCl₃," *IEEE Journal of Quantum Electronics* **32**, 2166(1996).
- S. R. Bowman, L. B. Shaw, B. J. Feldman, and Joseph Ganem, "A 7-Micron Praseodymium Based Solid-State Laser," *IEEE Journal of Quantum Electronics* **32**, 646(1996).
- S. R. Bowman, Joseph Ganem, B. J. Feldman, and A. W. Kueny, "Infrared laser characteristics of praseodymium doped lanthanum trichloride," *IEEE Journal of Quantum Electronics* **30**, 2925(1994).
- Joseph Ganem, S. R. Bowman and B. J. Feldman, "Excited-state dynamics in Pr³⁺:LaCl₃," *Journal of Luminescence* **58**, 298(1994).
- G. P. Flinn, K. W. Jang, Joseph Ganem, M. L. Jones, R. S. Meltzer and R. M. Macfarlane, "Sample-dependent optical dephasing in crystalline Y₂O₃:Eu³⁺," *Physical Review B*, **49**, 5821(1994).
- Ki Wan Jang, R. S. Meltzer and Joseph Ganem, "Persistent UV-induced optical dephasing in Pr-doped yttrium aluminum garnet," *Physical Review B*, **49**, 3009(1994).
- Joseph Ganem, P. A. Fedders and R. E. Norberg, "Deuteron spin-lattice relaxation of HD in solid argon," *Physical Review B*, **47**, 2581(1993).
- Joseph Ganem, W. M. Dennis and W. M. Yen, "One color sequential pumping of the 4f5d bands in Pr³⁺-doped yttrium aluminum garnet," *Journal of Luminescence* **54**, 79(1992).
- R. S. Meltzer, Joseph Ganem, Y. P. Wang, D. Boye, W. M. Yen, D. P. Landau, R. Wannemacher and R. M. Macfarlane, "Optical dephasing of paramagnetic ions: Er³⁺:YLiF₄ – Experiments and computer simulations," *Journal of Luminescence* **53**, 1(1992).
- Xiao-jun Wang, Joseph Ganem, W. M. Dennis and W. M. Yen, "Decay processes of nonequilibrium phonons in Pr³⁺-doped yttrium aluminum garnet," *Physical Review B*, **44**, 900(1991).
- Joseph Ganem, Y. P. Wang, R. S. Meltzer and W. M. Yen, "Magnetic-field dependence of photon-echo decays in ruby," *Physical Review B*, **43**, 8599(1991).
- Joseph Ganem, Y. P. Wang, D. Boye, R. S. Meltzer, W. M. Yen and R. M. Macfarlane, "Nonexponential photon-echo decays of paramagnetic ions in the superhyperfine limit," *Physical Review Letters* **66**, 695(1991).
- Joseph Ganem and R. E. Norberg, "Deuteron relaxation in HD–n-D₂ mixtures," *Physical Review B*, **43**, 1(1991).

Books

- Joseph Ganem, *The Two Headed Quarter: How to See Through Deceptive Numbers and Save Money on Everything You Buy*, (Chartley Publishing, Baltimore, 2007).

Patents

- Steven R. Bowman, Joseph Ganem and Barry J. Feldman, "Optically pumped, praseodymium based solid state laser," patent number 5,535,232, date of patent July 6, 1996.

Newspaper/Magazine Articles

- Joseph Ganem, "Teachers: Impossible Expectations," *The Daily Riff*, April 2011.
- Joseph Ganem, "Lessons from a swindler," *Baltimore Sun*, February 23, 2011.
- Joseph Ganem, "Science Education: Missing a Larger Point," *The Daily Riff*, January 2011.
- Joseph Ganem, "Do Adult Leaders Model The Educational Values They Espouse?" *The Daily Riff*, December 2010.
- Joseph Ganem, "Society Flunks Out," *Baltimore Sun*, October 3, 2010.
- Joseph Ganem, "The Expectations Trap," *The Daily Riff*, September 2010.
- Joseph Ganem, "Financial Literacy: Making Math Relevant," *The Daily Riff*, June 2010.
- Joseph Ganem, "The Fundamental Flaw in Education Policy," *The Daily Riff*, April 2010.
- Joseph Ganem, "Why Testing Fails," *The Daily Riff*, February 2010.
- Joseph Ganem, "Teaching too-hard math concepts does students no favors," *Baltimore Sun*, November 2, 2009.
- Joseph Ganem, "A Math Paradox: The Widening Gap Between High School and College Math," *APS News*, Vol. 18, No. 9, Oct. 2009, p. 8.
- Joseph Ganem, "Five Ways to Make Your Money Go Further," *Loyola Magazine*, Spring 2009, p. 19
- Joseph Ganem, "Marketers Play Games With Numbers," *Bottom Line Wealth*, Vol. 1, No. 2, Oct. 2008, p. 9
- Joseph Ganem, "Faulty assumptions led to mortgage mess," *Baltimore Sun*, January 16, 2008.
- Joseph Ganem, "Deceptive math of subprime mortgage loans ensnares consumers," *Baltimore Sun*, April 4, 2007.

GRANTS

- Loyola University, Summer research grant: "Development of Optically-pumped Mid-IR Phosphor Materials," (2010).
- Loyola University, Fully funded one-semester sabbatical: "A Study of Energy Transfer Processes that Activate the Mid-infrared Transitions of Praseodymium Ions in Potassium Lead Chloride," (2009).
- Loyola University, Summer research grant: "Growth and Characterization of Praseodymium-Doped Potassium Lead Chloride Crystals," (2009).
- Loyola College: Summer research grant: "Optical Spectroscopy of Thulium-sensitized Lead Chloride Based Laser Crystals," (2007).
- Loyola College: Summer research grant: "Optical Spectroscopy of Lead Chloride Based Laser Crystals," (2006).

National Science Foundation, RUI: "Synthesis and optical spectroscopy of thulium sensitized potassium lead chloride laser materials," \$117,746 (2003-2007).

Loyola College, Fully funded one-year sabbatical: "Synthesis and Optical Spectroscopy of Lead Chloride Based Laser Crystals," (2002).

National Science Foundation, Research Experience for Teachers (RET) supplement to the NSF grant: "RUI: Growth and Spectroscopy of Low-Phonon Energy Materials," \$9074 (2001).

National Science Foundation, RUI: "Synthesis and optical spectroscopy of low-phonon energy materials," \$116,074 (1999-2003).

Petroleum Research Fund, "Growth and Spectroscopy of Mid-infrared Luminescent Materials," \$25,000 (1997-1999).

Research Corporation, Cottrell College Science grant: "Mid-infrared spectroscopy of low-phonon energy materials," \$38,000 (1995-1997).

Loyola College, Summer research grant: "Growth of crystals for long wavelength lasers" (1995).

PROFESSIONAL PROGRAM PRESENTATIONS

Joseph Ganem (invited panelist), "Developing quantitative, scientific, and financial literacy in K-12 for college and career readiness," Meeting of the Ohio Mathematics and Science Coalition, Columbus, OH, May 14, 2010.

Joseph Ganem, "Consumer Smarts," Renew Wellness Day, Loyola University Maryland, Baltimore, MD, March 21, 2010.

Joseph Ganem, Daniel Howse, Michael Logie, A. G. Bluiett, S. O'Connor, N. J. Condon, and S. R. Bowman, "A mid-IR phosphor using Pr^{3+} - Tm^{3+} -doped KPb_2Cl_5 ," March meeting of the American Physical Society, Portland, OR, March 19, 2010.

Joseph Ganem (invited panelist), "What's really bring down the American consumer: poor math skills," Consumerist Meet Up, New York, NY, January 21, 2010.

Joseph Ganem, "Quantitative literacy applied to modern advertising," Conference on Science and Society, University of Cambridge, UK, August 7, 2009.

Joseph Ganem (invited talk), "How to See Through Deceptive Numbers" - College of Notre Dame in Maryland, Inductions into the mathematics honor society: Kappa Mu Epsilon, Baltimore, MD, November 16, 2008.

Joseph Ganem, "Two-Headed Quarters: How to See Through Deceptive Numbers and Save Money," The Saturday Seminar, Loyola University Maryland, Baltimore, MD, April 26, 2008.

Joseph Ganem (invited talk), "Materials for Novel Countermeasure Lasers," NSF Grantees Workshop, Tuskegee, AL, June 14, 2006.

Steven R. Bowman, Nicholas J. Condon, Shawn O'Connor, Neil S. Jenkins, A. G. Bluiett and Joseph Ganem, "Growth and characterization of direct mid-IR laser materials," presented at Photonics West, San Jose, California, January 24, 2005.

- Joseph Ganem, Michael Logie, A. G. Bluiett, N. J. Condon, and S. R. Bowman, "Thulium sensitization of praseodymium mid-infrared transitions in potassium lead chloride laser crystals," presented at the Optical Society of America Annual Meeting, Rochester, New York, October 12, 2004.
- Joseph Ganem, Michael Logie, A. G. Bluiett, N. J. Condon, and S. R. Bowman, "Thulium sensitization of praseodymium mid-infrared transitions in potassium lead chloride laser crystals" presented at the Conference on Lasers and Electro-Optics, San Francisco, California, May 20, 2004.
- A. G. Bluiett, N. J. Condon, S. R. Bowman, Michael Logie, and Joseph Ganem, "Thulium sensitized neodymium for mid-infrared laser development," presented at the Conference on Lasers and Electro-Optics, San Francisco, California, May 19, 2004.
- N. W. Jenkins, S. R. Bowman, S. O'Connor, S. K. Searles, and Joseph Ganem, "Spectroscopic characterization of Er-doped KPb_2Cl_5 laser crystals," presented at Optical Society of America's annual meeting, Orlando, Florida, September 30, 2002.
- Joseph Ganem, Jennifer Crawford, Paul Schmidt, N. W. Jenkins, and S. R. Bowman, "Thulium Cross-Relaxation in a Low-Phonon energy Crystalline Host," presented at the March 2002 meeting of the American Physical Society in Indianapolis, IN, March 17-21, 2002.
- Joseph Ganem, "Growth and Optical Studies of Laser Crystals," invited presentation at the NSF RET Workshop, Columbia, MD, February 23, 2002.
- S. R. Bowman, S. K. Searles, N. W. Jenkins, S. B. Qadri, E. F. Skelton and Joseph Ganem, "Diode pumped room temperature mid-IR erbium laser," presented at the Conference on Lasers and Electro-Optics, Baltimore MD, May 6-11, 2001.
- S. R. Bowman, S. K. Searles, N. W. Jenkins, S. B. Qadri, E. F. Skelton and Joseph Ganem "Diode pumped room temperature 4.6 μm erbium laser," presented at the Optical Society of America's Topical Meeting on Advanced Solid-State Lasers in Seattle, Washington, January 28 - February 1, 2001.
- Joseph Ganem, Jennifer Crawford, N. W. Jenkins, and S. R. Bowman, "Endothermic Cross Relaxation in a Tm^{3+} -Doped YCl_3 ," presented at the Optical Society of America's Topical Meeting on Advanced Solid-State Lasers in Seattle, Washington, January 28 - February 1, 2001.
- Joseph Ganem, Paul Schmidt, and Steven Bowman, "Cross Relaxation in a Tm^{3+} -Doped Low-Phonon energy Laser Material," presented at the Optical Society of America's Topical Meeting on Advanced Solid-State Lasers in Davos, Switzerland, February 14-17, 2000.
- Joseph Ganem, Paul Schmidt, S. R. Bowman and S. K. Searles, "Growth and spectroscopy of erbium doped chloride crystals," presented at the Meeting of the American Physical Society, Atlanta, GA, March 22-26, 1999.
- Joseph Ganem, Paul Schmidt, S. Searles, S. R. Bowman, "Spectroscopy of Erbium Doped Yttrium and Lead Chloride Crystals," presented at the Optical Society of America's Annual Meeting, Baltimore, MD, October 4-9, 1998.
- S. Searles, S. R. Bowman, Joseph Ganem, and Paul Schmidt, "Further investigations of potential 4 micron laser materials," presented at the Optical Society of America's Topical Meeting on Advanced Solid-State Lasers in Boston, MA, February 1-3, 1999.
- Joseph Ganem, Paul Schmidt, S. Searles, S. R. Bowman, "Spectroscopy of Erbium Doped Yttrium and Lead Chloride Crystals," presented at the Optical Society of America's Annual Meeting, Baltimore, MD, October 4-9, 1998.

- S. R. Bowman, L. B. Shaw, S. Searles, B. J. Feldman, Sean M. Kirkpatrick, Joseph Ganem, I. Gambaryan, T. Sanamyan, E. Vartanyan, "Investigations of a mid-infrared erbium laser," presented at the Optical Society of America's Topical Meeting on Advanced Solid-State Lasers in Coeur d'Alene, ID, February 1-3, 1998.
- Joseph Ganem, "How to Get Your First Grant in Physics or Astronomy," Invited presentation at the 6th National Conference: Council on Undergraduate Research, North Carolina Central University, Durham, NC, June 28, 1996.
- L. B. Shaw, S. R. Bowman, B. J. Feldman and Joseph Ganem, "Spectroscopic Investigations of Mid-IR Transitions of Pr^{3+} in LaCl_3 ," presented at the Conference on Lasers and Electro-Optics, Anaheim, CA, June 3-7, 1996.
- Joseph Ganem, J. Michael Watters, L. B. Shaw, S. R. Bowman, B. J. Feldman, "Growth of rare-earth doped chloride crystals for use in mid-infrared lasers," presented in session R20 at the March Meeting of the American Physical Society, March 18-22, 1996, St. Louis, MO.
- J. Michael Watters, Joseph Ganem, L. B. Shaw, S. R. Bowman, B. J. Feldman, "Growth of a lightly doped $\text{Pr}^{3+}:\text{LaCl}_3$ crystal to determine radiative transition rates," presented at the undergraduate poster session H50 at the March Meeting of the American Physical Society, St. Louis, MO, March 18-22, 1996.
- S. R. Bowman, L. B. Shaw, J. A. Moon, B. B. Harbinson, and Joseph Ganem, "Spectroscopic Studies of Potential Mid-IR Laser Materials" presented at the 1996 Optical Society of America's Topical Meeting on Advanced Solid-State Lasers, San Francisco, CA.
- S. R. Bowman, L. B. Shaw, B. J. Feldman, and Joseph Ganem, "A Room Temperature 7 Micron Solid State Laser," presented in the post deadline session (paper CPD 26-1) at the Conference on Lasers and Electro-Optics, Baltimore, MD, May 21-26, 1995.
- S. R. Bowman, L. B. Shaw, B. J. Feldman, and Joseph Ganem, "A Seven Micron Solid State Laser," presented at the Optical Society of America's Topical Meeting on Advanced Solid-State Lasers, Memphis TN, February 1, 1995.
- S. R. Bowman, Joseph Ganem, B. J. Feldman and A. W. Kueny, "Mid-infrared lasing characteristics of $\text{Pr}^{3+}:\text{LaCl}_3$," presented at the Conference on Lasers and Electro-Optics, (1994).
- S. R. Bowman, Joseph Ganem, B. J. Feldman and A. W. Kueny, "New infrared laser channels for praseodymium," presented at the Conference on Advanced Solid-State Lasers (1994).
- S. R. Bowman, Joseph Ganem and B. J. Feldman, "Mid-infrared Spectroscopic Analysis of $\text{Pr}^{3+}:\text{LaCl}_3$," Conference on Lasers and Electro-Optics, *Technical Digest Series* **11**, 490(1993).
- G. P. Flinn, Joseph Ganem, K. W. Jang, M. L. Jones, R. S. Meltzer and R. M. Macfarlane, "Anomalous Dephasing in Single Crystal $\text{Eu}^{3+}:\text{Y}_2\text{O}_3$ Fibers," *Bull. Am. Phys. Soc.* **38**, No. 1, 467(1993).
- Ki Wan Jang, Joseph Ganem, W. M. Yen and R. S. Meltzer, "Effects of UV Irradiation on Optical Dephasing Measurements in $\text{Pr}^{3+}:\text{YAG}$," *Bull. Am. Phys. Soc.* **37**, No. 1, 774(1992).
- Joseph Ganem, Y. P. Wang, D. Boye, R. S. Meltzer, W. M. Yen and R. M. Macfarlane, "Nonexponential Superhyperfine-Limited Photon Echo Decays," Conference on Quantum Electronics Laser Science, *Technical Digest Series*, **11**, 144(1991).
- X. J. Wang, Joseph Ganem, W. M. Dennis and W. M. Yen, "Anharmonic Decay of Nonequilibrium Phonons in $\text{YAG}:\text{Pr}^{3+}$," *Bull. Am. Phys. Soc.* **36**, No. 3, 918(1991).

Joseph Ganem, Y. P. Wang, D. Boye, R. S. Meltzer, W. M. Yen and R. M. Macfarlane, "Magnetic Field Dependence of Photon Echo Decays for Paramagnetic Ions," *Bull. Am. Phys. Soc.* **36**, No. 3, 891(1991).

Joseph Ganem, J. H. Lyou and R. E. Norberg, "Deuteron Spin-Lattice Relaxation of HD in Solid Argon", *Bull. Am. Phys. Soc.* **34**, No. 3, 476(1989).

Joseph Ganem and R. E. Norberg, "Deuteron Magnetic Resonance in Solid D₂/HD Mixtures," *Bull. Am. Phys. Soc.* **33**, No. 3, 284(1988).

Joseph Ganem, G. A. Mohr and R. E. Norberg, "Deuteron Magnetic Resonance in HD/n-D₂ Mixtures," *Bull. Am. Phys. Soc.* **32**, No. 3, 752(1987).

PROFESSIONAL SERVICE

- Member of the American Physical Society
- Reviewed papers for the following journals:

Journal of Luminescence
Journal of the Optical Society of America
Optics Communications
Optics Letters
American Journal of Physics
Optics Express

- Reviewed textbook on quantum mechanics for Jones Bartlett Publishers.
- Reviewed research proposals for the following funding agencies:

Petroleum Research Fund
Research Corporation
U. S. Army
National Science Foundation *

* Served on an NSF review panel that met January 22-23, 2004 under the direction of Dr. Filbert Bartoli in Arlington, VA. The panel was responsible for reviewing 30 unsolicited proposal submitted to the program for Electronic and Communication Systems.

COLLEGE SERVICE

Faculty Development Committee (1999 - 2001)
Core Advisor (1995-2002, 2006 - present)
Major Advisor (2003 – 2007)
Academic Standards Committee (1995 – 2002, 2008 - present)
Pre-health Professional Committee (1996 – 1998, 2003-present)
Pre-health advisor (Fall 2007)
Academic Senate (2003 – present)
Core Review Committee (2004 – 2008)

TEACHING

Courses Taught

Number	Title	Semesters
FE 100	First Year Experience	F95
EG 301	Statics	F07
EG 302	Dynamics	S09
PH 101	Introduction to Physics I	F94, F95, F96, F97, F03, F06, F07, F08, F10
PH 102	Introduction to Physics II	S95, S96, S97, S98, F03, S06, S07, S08, S09, S10, S11
PH 130	Physics and Philosophy	F99
PH 155	The Making of the Atomic Bomb	S02, S04
PH 160	Light and Color	S95, S96, S99, S01
PH 191	Introductory Physics Lab I	S95, S96, F07
PH 192	Introductory Physics Lab II	S95, S96, S08
PH 201	General Physics I	F00, F01, F04
PH 202	General Physics II	S01, S02, S05
PH 291	General Physics Lab I	F00, F04, F05, F07
PH 292	General Physics Lab II	S05, S06, S08
PH 307	Waves and Fields	F03, F04, F05
PH 316	Classical Mechanics	S08, S09, S10
PH 318	Thermal Physics	S99, F00, F01, F06, F08, S11
PH 371	Scientific Computing	F96
PH 391	Physics Research	S96, F97, S99
PH 395	Instrumentation II	F99, F01
PH 396	Modern Physics Lab	S97, S98, S99
PH 398	Experimental Methods II	S02
PH 415	Quantum Mechanics I	S05, F05, F06
PH 450	Quantum Mechanics II	S06, S07
PH 460	Optics	F94, F95, F97, F99
PH 480	Special Topics	S01
PH 490	Optics Laboratory	F94, F95
PH 493	Advanced Laboratory	F05, S07, F08 F10

Undergraduate Research Assistants

J. Michael Watters - (1995)
Michael Tietjen - (1995 - 1996)
Tim Alt - Hauber - (1997)
Paul Schmidt - (1997- 1998)
Jason Ruggieri - (1999)
Brian McIlhargie - (1999)
Jennifer Crawford - (2000)
Michael Logie - (2004 - 2006)
Daniel Howse - (2007 - 2008)
Roland Jeannier - (2009)
Amanda Olmsted - (2010)