

**CURRICULUM VITAE**  
**PAUL KENJI URAYAMA, Ph.D.**

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Department of Physics  
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updated: January 2010. (abridged)

**I. EDUCATION**

**Princeton University, Princeton, NJ**

Ph.D. Physics, June 2001.

Thesis Advisor: Professor Sol M. Gruner.

Thesis title: "Techniques for High Pressure Macromolecular Crystallography and the Effects of Pressure on the Structure of Sperm Whale Myoglobin"

M.A. Physics, June 1996.

**University of California, Irvine, CA**

B.S. Physics, June 1994. *Summa Cum Laude*.

Concentration in Biomedical Physics.

Thesis Advisor: Professor Gregory Benford.

B.S. Biological Sciences, June 1994. *Magna Cum Laude*.

**II. APPOINTMENTS**

- 2009-present. Associate Professor. Miami University, Oxford, OH. Department of Physics.  
2003- 2009. Assistant Professor. Miami University, Oxford, OH. Department of Physics.  
2003. Research Fellow. University of Michigan, Ann Arbor. Department of Biomedical Engineering.  
2001-2002. Research Associate. Dartmouth College, Hanover, NH. Department of Physics and Astronomy.  
1997-2001. Visiting Scientist. Cornell University, Ithaca, NY. Laboratory of Atomic and Solid State Physics, Department of Physics.  
1994-1997. Assistantship in Research. Princeton University. Department of Physics.  
1995-1996. Assistantship in Instruction. Princeton University. Department of Physics.  
1994. Teaching Assistant. University of California at Irvine. Department of Physics.

**III. AWARDS AND HONORS**

2008. nominated E. Phillips Knox Teaching Award, Office of the Provost and the Committee for the Enhancement of Learning and Teaching.  
2008. nominated Outstanding Professor Award, Associated Student Government.  
2007. Outstanding Faculty Award for Excellence in Teaching, awarded by the Department's Class of 2007.  
2005. Sigma Xi, full member.  
1999. Honorable mention in *Year's Best Science Fiction: Sixteenth Annual Collection*, Gardner Dozois ed. New York: St. Martin's Press.  
1998. Recommended Reading List, *Locus Magazine* (a science fiction trade publication).  
1994-1997. Liposome Company Fellowship.  
1994. Joseph Henry Prize, Physics Dept, Princeton University. For an outstanding incoming graduate student.  
1994. Graduation with Honors, Department of Physics, University of California at Irvine.  
1994. Outstanding Graduating Senior, Dept. of Physics, University of California at Irvine.  
1994. Dean's Academic Achievement and Service Award, Dept of Biological Sciences, University of California at Irvine.

- 1993-1994. Barry M. Goldwater Scholarship.  
 1993. Sigma Pi Sigma, inductee. A national physics honor society.  
 1992. Sigma Xi, associate member.  
 1991. Phi Beta Kappa.

#### IV. FUNDING SUPPORT

##### PAST AND CURRENT

reverse chronological

1. Faculty Research Grant, Miami University. 2010-2011. internal.
2. Principal Investigator. Cottrell College Science Awards, Research Corporation. 2008-2010. "Pressure effects on the free/protein-bound NADH ratio probed using endogenous cellular fluorescence." external.
3. Principal Investigator. Cottrell College Science Awards, Research Corporation. 2004-2007. "Development of a Novel Imaging Chamber for High-Pressure Biological Fluorescence Microscopy." external.
4. Undergraduate Summer Scholars program, Miami University. 2004(1 student), 2005(1), 2006(2), 2007(2), 2008(1), 2009(2). internal.
5. Summer Research Grant, College of Arts and Science, Miami University. 2004. Internal.
6. Faculty Research Grant, Miami University. 2003-2005. internal.

#### V. PUBLICATIONS

reverse chronological. \* while at Miami University. Undergraduate student authors are underlined.  
*Graduate student authors are italicized.*

##### PEER-REVIEWED ARTICLES

1. \* **P. Urayama**, *E.W. Frey*, and *S.R. Savage*. *Fluorescent probe dyes for metabolic-ion sensing under high hydrostatic pressures*, Annals of the New York Academy of Sciences: High-Pressure Bioscience and Biotechnology - Fifth International Conference (accepted for publication).
2. \* *H.M. DePedro*, **P. Urayama**. *Using LysoSensor Yellow/Blue DND-160 to sense acidic pH under high hydrostatic pressures*, Analytical Biochemistry, 384: 359-361 (2009). doi:10.1016/j.ab.2008.10.007
3. \* S.B. Keller, J.A. Dudley, K. Binzel, J. Jasensky, *H.M. DePedro*, *E.W. Frey*, **P. Urayama**. *A calibration approach for rapid fluorescence lifetime determination for applications using time-gated detection and finite pulse width excitation*, Analytical Chemistry, 80: 7876-7881 (2008). doi:10.1021/ac801252q
4. \* *E.W. Frey*, **P. Urayama**. *A fluid handling system with finger-tightened connectors for biological studies at kilo-atmosphere pressures*. Review of Scientific Instruments. 79: 046103 (2008). doi:10.1063/1.2907245. Listed in the April 15, 2008 edition of the *Virtual Journal of Biological Physics Research*.
5. \* *T. Haver*, *E.C. Raber*, **P. Urayama**. *An application of spatial deconvolution to a capillary-based high-pressure chamber for fluorescence microscopy imaging*. Journal of Microscopy. 230: 363-371 (2008). doi:10.1111/j.1365-2818.2008.01994.x
6. \* M. Salerno, J.J. Ajimo, J.A. Dudley, K. Binzel, **P. Urayama**. *Characterization of dual-wavelength SNAFL and SNARF dyes for pH sensing under high hydrostatic pressures*. Analytical Biochemistry. 362: 258-267 (2007). doi:10.1016/j.ab.2006.12.042
7. \* *E.C. Raber*, J. Dudley, M. Salerno, **P. Urayama**. *Capillary-based, high-pressure chamber for fluorescence microscopy imaging*. Review of Scientific Instruments. 77: 096106 (2006). doi:10.1063/1.2349303. Listed in the October 1, 2006 edition of the *Virtual Journal of Biological Physics Research*.
8. **P. Urayama**, W. Zhong, J.A. Beamish, F.K. Minn, R.D. Sloboda, K.H. Dragnev, E. Dmitrovsky, M.-A. Mycek. *A UV-visible-NIR fluorescence lifetime imaging microscope for laser-based biological sensing with picosecond resolution*, Applied Physics B. 76: 483-496 (2003).

9. W. Zhong, **P. Urayama**, M.-A. Mycek. *Imaging fluorescence lifetime modulation of a ruthenium-based dye in living cells: the potential for oxygen sensing*, Journal of Physics D: Applied Physics. 36: 1689-1695 (2003).
10. **P. Urayama**, S.M. Gruner, G.N. Phillips Jr. *Probing substates in sperm whale myoglobin using high pressure crystallography*, Structure. 10: 51-60 (2002).
11. D.A. Hajduk, **P. Urayama**, S.M. Gruner, S. Erramilli, R. Register, K. Brister, and L. J. Fetters. *High pressure effects on the disordered phase of block copolymer melts*, Macromolecules. 28: 7148-7156 (1995).
12. **P. Urayama**, G. Benford. *Modeling energy flow in turbulent beam-plasma experiments*, Physics of Plasmas. 2: 2117-2121 (1995).
13. W.W. Heidbrink, D. Adams, S. Drum, K. Evans, J. Manson, T. Price, **P. Urayama**, F. J. Wessel. *Propagation of a narrow plasma beam in an oblique magnetic field*. Physics of Fluids B. 4: 3454-3456 (1992).

#### PEER-REVIEWED CONFERENCE ABSTRACTS

1. \* **P. Urayama**, E.W. Frey, S.R. Savage. "High-pressure, fluorescence-based sensing of calcium ions." Fifth International Conference on High-Pressure Bioscience and Biotechnology, in press (2008).
2. \* **P. Urayama**, M. Salerno, J. Dudley, K. Binzel, J. Jasensky, E. Frey, S. Keller, A. Zorn. *Characterization of dual-wavelength pH-sensing fluorophores under high hydrostatic pressures*. 2007 Biophysical Society Meeting Abstracts. Biophysical Journal, Supplement: 369a (2007).
3. \* M.-A. Mycek, W. Zhong, **P. Urayama**. *Investigating cellular metabolic function using fluorescence lifetime imaging microscopy*. Optical Society of America Topical Conference: Advances in Biomedical Optical Spectroscopy and Diagnostics (BOSD), 2004.
4. M.-A. Mycek, **P. Urayama**, K. Heyman, and M. Bussey. *Using POPOP's Viscosity Dependent Lifetime as a Picosecond Resolution Standard in Near-UV Fluorescence Lifetime Imaging Microscopy*, in SPIE International Symposium on Biomedical Optics (BiOS 2003).
5. **P. Urayama**, J.A. Beamish, F.K. Minn, E.A. Hamon, M.-A. Mycek. *A UV fluorescence lifetime imaging microscope to probe endogenous cellular fluorescence*, in OSA Trends in optics and photonics (TOPS) Vol. 73, Conference on Lasers and Electro-Optics, OSA Technical Digest, Postconference Edition (Optical Society of America, Washington, DC, 2002), pp. 550-551.
6. **P. Urayama**, W. Zhong, R.D. Sloboda, K.H. Dragnev, E. Dmitrovsky, and M.-A. Mycek. *Probing endogenous fluorophores in cellular cancer models using temporally and spectrally resolved laser induced fluorescence*, in OSA Trends in optics and photonics (TOPS) Vol. 73, Conference on Lasers and Electro-Optics, OSA Technical Digest, Postconference Edition (Optical Society of America, Washington, DC, 2002), pp.587-588.
7. M.-A. Mycek, J. Pitts, R. Sloboda, **P. Urayama**, W. Zhong, K. Dragnev, and E. Dmitrovsky. *Using endogenous fluorescence to probe mitochondrial function in human bronchial epithelial cells*, Biophysical Journal 82 Part2: 2113 (2002).

#### BOOK CHAPTERS

1. **P. Urayama** and M.-A. Mycek. *Fluorescence lifetime imaging microscopy of endogenous biological fluorescence*, in Handbook of Biomedical Fluorescence, M.-A. Mycek and B. W. Pogue, eds. Marcel Dekker: New York, 2003, pp.211-236.

#### CREATIVE WORKS (PROFESSIONAL AND SEMI-PROFESSIONAL MARKETS)

1. "Run Free and Sow Your Myopic Oats," *Neverworlds*, February 1999.
2. "Living in a Stranger," *Analog Science Fiction and Fact*, October 1998.

#### VI. PRESENTATIONS

reverse chronological. \* while at Miami University.

**INVITED CONFERENCE PRESENTATIONS**

1. \* *Kilo-Atmosphere X-ray Crystallography: A Technique for Studying Macromolecular Structure Under Pressure*. Telluride Science Research Center Workshop: Biophysical and Biochemical Properties of Ion Channels in Epithelia, Telluride, CO. July 2004.
2. Cornell High Energy Synchrotron Source User's Meeting, Ithaca, NY. June 2002.
3. International Workshop of the Commission on High Pressure, International Union of Crystallography, Orsay, France. September 2001.
4. International Union of Crystallography Conference, Glasgow, Scotland. August 1999.

**CONFERENCE PRESENTATIONS**

1. \* Biophysical Society Meeting, San Francisco, CA. poster. February 2010.
2. \* Ohio-Region Section of the American Physical Society, Delaware, OH. poster. October 2009.
3. \* Ohio-Region Section of the American Physical Society, Delaware, OH. poster. October 2009.
4. \* Fifth International Conference on High-Pressure Bioscience and Biotechnology, La Jolla, CA. seminar talk. September 2008.
5. \* Ohio-Region Section of the American Physical Society, Youngstown, OH. poster. March 2008.
6. \* Biophysical Society Meeting, Long Beach, CA. poster. February 2008.
7. \* Ohio-Region Section of the American Physical Society, Oxford, OH. poster. October 2007.
8. \* Ohio-Region Section of the American Physical Society, Oxford, OH. poster. October 2007.
9. \* Ohio-Region Section of the American Physical Society, Oxford, OH. seminar. October 2007.
10. \* Biophysical Society Meeting, Baltimore, MD. platform seminar. March 2007.
11. \* Biophysical Society Meeting, Salt Lake City, UT. poster. February 2006.
12. \* Ohio Section of the American Physical Society, Dayton, OH. poster. April 2005.
13. \* Ohio Section of the American Physical Society, Dayton, OH. poster. April 2005.
14. \* Ohio Section of the American Physical Society, Athens, OH. poster. April 2004.
15. Gordon Conference, Meriden, NH. poster. July 2002.
16. CLEO-QELS Conference, Long Beach, CA. seminar. May 2002.
17. CLEO-QELS Conference, Long Beach, CA. poster. May 2002.
18. OSA Annual Meeting, Long Beach, CA. poster. October 2001.

**SEMINAR AND COLLOQUIUM PRESENTATIONS**

1. \* Microbiology Department Seminar, Miami University, February 2009.
2. \* Physics Departmental Seminar, Miami University. November 2007.
3. \* Physics Departmental Seminar, Miami University. October 2003.
4. Physics Departmental Seminar, Miami University. February 2003.
5. Physics and Astronomy Seminar, Colgate University. March 2001.
6. Condensed Matter Seminar, Dept. of Physics and Astronomy, Dartmouth College. March 2001.

**VII. RESEARCH ADVISED AND MENTORED AT MIAMI UNIVERSITY**

reverse chronological.

**THESIS COMMITTEE SERVED (UNDERLINED IF PRIMARY ADVISOR)**

Kenneth Brown	Geology, Ph.D. 2012 (expected).
<u>Ryan Mallory</u>	Physics, M.S. 2011 (expected).
<u>Erik Alquist</u>	Physics, M.S. 2010 (expected).
<u>Mohammed J. Farooqi</u>	Physics, M.S. 2009.
<u>Hector Michael de Pedro</u>	Physics, M.S. 2008.
<u>Michael Maffett</u>	University and Department Honors, Eng. Physics B.S. 2008.
<u>Eric Frey</u>	University and Department Honors, Physics B.S. 2008.
<u>Thomas Haver</u>	Physics, M.S. 2007.
Willis Agutu.	Physics, M.S. 2007.
<u>Erica Raber</u>	Physics, M.S. 2006.
Ethan Karp	University and Department Honors, Physics B.S. 2006.

Morgan Welsh	Department Honors, Physics B.S. 2006.
<u>Jacob Ajimo</u>	Physics, M.S. 2005.
Yong Xue Yu	Physics, M.S. 2005.
Martin Waichigo	Chemistry, Ph.D. 2005.

**GRADUATE STUDENTS ADVISED (5 THESES ADVISED, 2 IN PROGRESS).**

Ryan Mallory (in progress), Erik Alquist (in progress), Mohammed J. Farooqi, Hector Michael de Pedro, Thomas Haver, Erica Raber, Jacob Ajimo.

**UNDERGRADUATE STUDENTS ADVISED (25 STUDENTS, 3.0 SEMESTER AVG INVOLVEMENT).**

Class of...

2011	Mikey McLaughlin, Jordan Ryan.
2010	Zachary Gault, Karen Lai, Lauren Regueyra, Abigail Zofkie.
2009	Steven Boehmer, Brian Casto, Joshua Jasensky, Sara Savage.
2008	Colin Boyle, Rachel Chase, Eric Frey, Daniel Horne, Scott Keller, Michael Maffett.
2007	Katherine Binzel, John Dudley, Michael Salerno, Amanda Zorn.
2006	Jeremy Clark.
2005	Pedro Calderon, Matt Laroche, Bill Schneider, Grant van Eerden.

**VIII. COURSES TAUGHT AT MIAMI UNIVERSITY**

Arranged by course number.

PHYF108	First Year Seminar: Discovering Physics Using the Human Body. (3 credits)
PHY172	College Physics (3 credits)
PHY181.F	The Physical World, freshman section. (4 credits)
PHY182.F	The Physical World, freshman section. (4 credits)
PHY182	The Physical World. (4 credits)
PHY400/500	Department seminar. (1 credit)
PHY421/521	Introduction to Biophysics. (4 credits)
PHY423/523	Materials Physics. (4 credits)
PHY430/530	Topics in Physics. Physical Methods in Biology And Medicine. (3 credits)
PHY437/537	Intermediate Thermodynamics and Introduction to Statistical Physics. (4 credits)

Arrange in reverse chronological order.

Spring 2010.	PHY421.	Fall 2009.	PHYF108, PHY437.
Spring 2009.	PHY400/500, PHY172.	Fall 2008	PHY400/500, PHY437.
Spring 2008	PHY182, PHY421/521.	Fall 2007	PHY430/530.
Spring 2007	PHY 437/537.	Fall 2006	PHY 423/523.
Spring 2006	PHY 437/537.	Fall 2005	PHY181.F, PHY 421/521.
Spring 2005	PHY182.F.	Fall 2004	PHY181.F, PHY423/523.
Spring 2004	PHY 182.F, PHY430/530.	Fall 2003	PHY 421/521.

**IX. EDUCATION WORKSHOPS ATTENDED**

- Office of Liberal Education, workshop focusing on teaching assessment, Miami University. Fall 2008.
- New Faculty Workshops, American Association of Physics Teachers, College Park, MD. November 2005.
- Center for Writing Excellence workshop, Miami University. Steven Youra (Director, Hixon Writing Center, Caltech). "Improving student writing and learning in science and engineering courses." March 2005.

**X. COMMITTEES AND SERVICE**

reverse chronological.

**PROFESSIONAL**

2008-pres. Secretary, Sigma Xi, Miami University chapter.

- 2008. Session chair. Fifth International Conference on High-Pressure Bioscience and Biotechnology. September 2008.
- 2007. Session chair. Fall 2007 Ohio-Region Section of the American Physical Society meeting.
- 2007. Co-chair, platform session, 2007 Biophysical Society meeting.
- Proposal Reviewer, Research Corporation.
- Manuscript Reviewer, *Sensors*.
- Manuscript Reviewer, *Optics Letters*.
- Manuscript Reviewer, *Optics Express*.

#### UNIVERSITY

- 2009-pres. Graduate College Representative, doctoral committee for Kenneth Brown (geology).
- 2003-2005. Graduate College Representative, doctoral committee for Martin Waichigo (chemistry).

#### DEPARTMENTAL

- 2009-pres. Interim Co-Chair. Undergraduate Committee.
- 2008-2009. Colloquium organizer. Primary organizer for weekly seminar. Approximately 30 speakers.
- 2009. Host. Benson Memorial Lecture. Gerry Smith, Penn State Univ. & Positronics Research LLC.
- 2008. Host. Benson Memorial Lecture and Arfken Scholar. Gregory Benford, UC Irvine.
- 2007-2008. Strategic planning committee, undergraduate program sub-committee.
- 2007. Host. Arfken Scholar-in-Residence. Wei Zhong, Wellmen Center for Photomedicine and Harvard Medical School.
- 2005-2008. Class of 2008 Departmental Advisor.
- Department Oral Exam committees. (6 students)
- New Faculty Search Committees. (4 searches)

#### OTHER SERVICE

- 2009-pres. Faculty Advisor. Society of Physics Students. Miami University.
- 2008. Workshop leader. Miami University/Talawanda Science Week. May 12-16, 2008.
- 2007. Workshop leader. Miami University/Talawanda Science Week. May 7-11, 2007.
- 2006. Grand Awards Judge, Intel International Science and Engineering Fair, Indianapolis, IN. May 7-13, 2006.
- 2005-2006. Faculty Co-Advisor. Society of Physics Students. Miami University.
- 2005. Workshop leader. ESTEEM Workshop, School of Eng. Appl. Sci. Miami University. July 14, 2005
- 2004. Judge. Miami University Science Fair.
- 2002. Mentor. Women in Science Program. Dartmouth College. (2 students)
- 2001. Co-chair, book sales and demo. Expanding Your Horizons. Cornell University.
- 2000. Co-chair, book sales and demo. Expanding Your Horizons. Cornell University.
- 2000. Workshop leader. Research Experience for Teachers. Cornell University.

#### XI. SOCIETY MEMBERSHIPS

American Association for the Advancement of Science.  
 American Physical Society, life member.  
 Biophysical Society.  
 Sigma Xi, life member.

#### XII. ADVISORS

Undergraduate: Prof. Gregory Benford (Department of Physics and Astronomy, UC Irvine).  
 Graduate: Prof. Sol M. Gruner (Department of Physics, Cornell University).  
 Postdoctoral: Prof. Mary-Ann Mycek (Dept. of Biomedical Eng., University of Michigan).