

Matthew A. Wyczalkowski

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EDUCATION

Washington University in St. Louis, St. Louis, MO **August 2004 - present**
Ph.D. Candidate in Biomedical Engineering, Molecular Engineering program

University of California, Berkeley, CA **May 2000**
M.S. in Mechanical Engineering, emphasis in Dynamics and Fluid Dynamics

Pennsylvania State University, State College, PA **August 1996**
B.S. in Engineering Science, Engineering Mechanics minor.
University Scholars Program, graduated with distinction

University of Leeds, England **October 1994 - June 1995**
Junior Year Study Abroad

RESEARCH EXPERIENCE

Washington University in St. Louis, St. Louis, MO **August 2004 - present**
Advisor: Dr. Rohit Pappu
Investigating the thermodynamic driving forces responsible for the collapse of peptides in water using molecular dynamics computer simulations and statistical mechanical analyses. Developed and implemented advanced computational sampling techniques to investigate the solvation mechanisms of simple compounds. Investigated polyglutamine aggregation using nucleation theory and Fluorescence Correlation Spectroscopy experiments.

Mallinckrodt Institute of Radiology, St. Louis, MO **September 2002 - August 2004**
Position: Programmer Analyst II
Various design, implementation and analysis projects related to radiological computing, including: evaluation and analysis of large radiology image server system for performance and scalability; database and web application design to support clinical and small animal research; implementation of tests to evaluate interoperability and standards adherence of commercial radiological systems.

Onix Microsystems, Richmond, CA **December 2000 - August 2002**
Position: Test Engineer
Responsible for the design, implementation and analysis of systems to test performance of MEMS-based optical switch components. Mathematical modeling of optical devices, image acquisition and processing, and construction of laser and interferometry-based systems in a cleanroom environment.

Maze Technologies, San Francisco, CA **April 2000 - November 2000**
Position: Co-founder
Artificial intelligence research. Neural network design, implementation and testing.

University of California, Berkeley, CA

August 1997 - March 2000

Advisor: Dr. Andrew Szeri

Master's Thesis titled, "Optimal Two Mode Forcing of a Bubble." Analytical and numerical optimization of a nonlinear dynamical system, with applications to microbubbles as contrast agents in medical ultrasound.

Dept. of Radiology, Hershey Medical Center, Hershey, PA

Summers 93 - 95, June 1996 - June 1997

Position: Research Assistant

Various projects related to radiological computing, including novel user interface design and performance testing of network protocols.

Pennsylvania State University, State College, PA

September 1995 - August 1996

Advisor: Dr. Akhlesh Lakhtakia

Senior Thesis titled, "Adequacy of the Linearized Local Electric Field Determination in a Cubically Nonlinear Composite."

Pennsylvania State University, State College, PA

September 1993 - May 1994

Advisor: Dr. Charles Bakis

Laboratory assistant, sample preparation in composite materials laboratory.

TEACHING EXPERIENCE

Washington University in St. Louis, St. Louis, MO

Fall 2007 - Spring 2008

Attended eight 1 1/2 hour teaching workshops, plus a 10 hour workshop on "Teaching with Technology."

Washington University in St. Louis, St. Louis, MO

Spring 2006

Teaching Assistant for Biomechanics class. Guest lectured once, conducted ten weekly review sessions, two exam review sessions, and graded homeworks.

Washington University in St. Louis, St. Louis, MO

Fall 2005

Guest lecture for Introduction to Biomedical Engineering class.

Pennsylvania State University, State College, PA

Spring 1996

Teaching assistant for Mechanics class. Guest lectured once, two exam help sessions and weekly office hours.

PROFESSIONAL DEVELOPMENT

International Graduate Research School in Applied Mechanics, Technical University of Denmark, Lyngby, Denmark, June 1999

Two week long session about Hamiltonian and Lagrangian mechanics with application to robotics.

Physical Acoustics Summer School, Asilomar, CA., June 1998

Week-long session, topics in various Physical Acoustic disciplines including ultrasound, sonoluminescence and acoustics.

Summer School '96, Copenhagen, Denmark, August 1996

Week-long session titled, *The Spontaneous Order of Life: In Search of the Laws of Self-Organization in Physical, Biological and Cognitive Systems*. Various topics in self-organization of complex systems, emergent phenomena and nonlinear dynamics.

PUBLICATIONS

Wyczalkowski and Pappu. "Satisfying the fluctuation theorem in free-energy calculations with Hamiltonian replica exchange", *Phys. Rev. E* 77, 026104 (2008)

Wang, Vitalis, Wyczalkowski, Pappu. "Characterizing the conformational ensemble of monomeric polyglutamine", *Proteins* 63, 297-311 (2006)

Wyczalkowski, Szeri. "Optimization of acoustic scattering from dual-frequency driven microbubbles at the difference frequency", J. Acoust. Soc. Am. 113 (6), 3073-3079 (2003)

Wyczalkowski. "Adequacy of the linearized local electric field determination in a cubically nonlinear composite", Optik 105:1, 41-44 (1997)

CONFERENCES

Biophysical Society Annual Meeting, Baltimore, MD	March 2007
Gibbs Conference on Biothermodynamics, Carbondale, IL	October 2006
Biophysical Society Annual Meeting, Salt Lake City, UT	February 2006
Gibbs Conference on Biothermodynamics, Carbondale, IL	October 2005
American Physical Society Division of Fluid Dynamics, San Francisco, CA	November 1997

PROFESSIONAL ASSOCIATIONS

Biomedical Engineering Society
Biophysical Society