

Adam H. Marblestone

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Date of Birth: May 19, 1987

Education

Harvard University

Ph.D. Candidate, Biophysics, 2009-Present

Yale University

B.S., Physics, 2009

Research

Wyss Institute for Biologically Inspired Engineering (Summer 2010-)

Research on molecular technology

Advisors: Professors George Church, William Shih and Peng Yin

Harvard University Department of Chemistry and Chemical Biology (Winter 2010)

Research on optogenetic voltage sensors

Advisor: Professor Adam Cohen

MIT Center for Bits and Atoms (Fall 2009-Summer 2010)

Research on microscale self-assembly

Advisors: Dr. Manu Prakash and Professor Neil Gershenfeld

Harvard Medical School Department of Genetics (Summer 2009)

His-tagged the translation machinery in E. coli using MAGE

Advisor: Professor George Church

Yale University Department of Applied Physics (Summer 2006; Spring 2008-Spring 2009)

Explored designs for quantum limited microwave amplifiers

Developed an entanglement assisted distributed computation protocol

Advisor: Professor Michel Devoret

Dana-Farber Cancer Institute Biomolecular Nanotechnology Group (Summer 2007-Spring 2009)

Co-authored a software tool for computer aided design of DNA nanostructures

Advisor: Professor William Shih

Publications

Gene assembly from chip-synthesized oligonucleotides

Nikolai Eroshenko*, Sriram Kosuri*, Adam Marblestone, Nicholas Conway, George M. Church.

Curr. Protoc. Chem. Biol. 4:1-17 (2012) Software at <http://synbiosis.med.harvard.edu:8080/gaspserver.rpy>

Multiplexed in Vivo His-Tagging of Enzyme Pathways for in Vitro Single-Pot Multienzyme Catalysis

Harris H. Wang*, Po-Yi Huang*, George Xu, Wilhelm Haas, Adam Marblestone, Jun Li, Steven Gygi,

Anthony Forster, Michael Jewett, George Church. *ACS Synth. Biol.*, 2012, 1 (2), pp 43–52

Exponential quantum enhancement for distributed addition with local nonlinearity

Adam Marblestone and Michel Devoret. *Quantum Information Processing*. Volume 9, Number 1, 47-59,

DOI: 10.1007/s11128-009-0126-9

Rapid prototyping of three-dimensional DNA-origami shapes with caDNAno

Shawn Douglas, Adam Marblestone, Surat Teerapittayanon, Alejandro Vazquez, George Church and

William Shih. *Nucleic Acids Research*. 37:5001–6 (2009) Software at <http://www.cadnano.org>

Signal-to-pump back-action and self-oscillation in double-pump Josephson parametric amplifier

Archana Kamal, Adam Marblestone and Michel Devoret. *Physical Review B*. 79:184301 (2009)

Awards

Fannie and John Hertz Foundation Lowell Wood Fellowship

James Mills Peirce Fellowship at Harvard

Fulbright Scholarship (declined)

Barry M. Goldwater Scholarship

Teaching

Harvard University BioDesign Team (2012)

Co-mentoring Harvard's biomolecular engineering and synthetic biology team.

Team website: <http://openwetware.org/wiki/Biomod/2012/Harvard/BioDesign>

Harvard University BioMod Team (2011)

Selected a team of undergraduate students and mentored them to identify and solve problems in biomolecular engineering as part of the inaugural BioMod Competition. *Placed 3rd in the world.*

Team website: <http://openwetware.org/wiki/Biomod/2011/Harvard/HarvarDNAos>

Harvard University (2011)

Teaching Fellow: Systems Biology 204 – Biomolecular Engineering and Synthetic biology

Teaching Fellow: Biophysics 242r – Biologically Inspired Molecular Engineering

Awarded Harvard University Certificate of Distinction in Teaching (Spring 2011)

Advisors: Professors William Shih, Peng Yin and Pamela Silver

Yale University Department of Physics (2006-2007, 2008-2009)

Peer Tutor: Physics 260, Intensive Introductory Physics

Advisors: Professor Steven M. Girvin and Professor Charles Baltay

Selected Coursework (Yale, Harvard and MIT)

Graduate Mathematical Methods of Physics

Graduate Quantum Mechanics I & II

Graduate Mesoscopic Physics

Graduate General Relativity

Graduate Statistical Physics

Graduate Quantum Theory of Solids

Noise: Dissipation, Amplification and Information

Statistical Mechanics

Electromagnetic Fields and Optics

Physics of Information Technology

Organic Chemistry

Principles of Biochemistry

Principles of Neuroscience

Principles of Neuroengineering

Biological Instrumentation and Measurement

Experimental Strategies in Cellular Biology

Design and Analysis of Algorithms

Data Structures and Programming Techniques

Advanced Computational Biology: Genomes, Networks and Evolution

Introduction to Lie Groups

Vector Calculus and Linear Algebra

Theory of Statistics

Real Analysis

Skills

Programming languages: C, Java, Python, Actionscript, Matlab, Mathematica

Experimental familiarity (i.e., some prior hands-on experience): analog electronics, microcontrollers, optics, micro-fluidic device fabrication, fluid flow systems; mechanical rapid prototyping including laser cutter, water-jet cutter, 3D printer, CNC micro-mill; nano-scale imaging by AFM, TEM, SEM, TIRF; recombinant DNA techniques, Gibson cloning, lambda red, MAGE, FACS; bacterial and mammalian cell culture and transfection; maintenance of *C. elegans*; DNA nanostructures; Illumina sequencing

Certifications: PADI Open Water Scuba Diver

Patents

Zhang, David Y; Marblestone, Adam H; Yin, Peng. "Ligation-based Assembly of Nucleic Acid Molecules Guided by Self-Assembled DNA Nanostructures." US provisional patent filed.

Conferences Attended

Productive Nanosystems: Launching the Technology Roadmap (Arlington VA, 2007)

DARPA InfoChemistry II (Cambridge, MA USA, 2009)

Molecular Programming Project Workshop (Caltech, 2010)

Stochastic Optical Reconstruction Microscopy Workshop (Harvard University, 2010)

NHGRI Sequencing Technology Development Meeting (San Diego CA, 2011)

References

Professor Michel H. Devoret

Yale University Departments of Applied Physics and Physics

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Professor William M. Shih

Harvard Medical School Department of Biological Chemistry and Molecular Pharmacology

E-mail: William.Shih@dfci.harvard.edu

Phone: (617) 632-5143; Fax: (617) 632-4393