

CURRICULUM VITAE

James Robert Martin

Permanent Address

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EDUCATION

Graduate: Ph.D. Computational and Applied Mathematics (CAM)
Institute for Computational Engineering and Sciences
University of Texas at Austin
Austin, Texas
2006-present

Undergraduate: B.S. Chemistry (June 2006)
Minor in Control and Dynamical Systems
California Institute of Technology
Pasadena, California
2002-2006
Overall GPA 3.78, Major GPA 3.96, Minor GPA 3.95
Emphasis in Physical Chemistry
Senior Thesis: Discrete Mechanics and Optimal Control
Thesis Advisor: Prof. Jerrold Marsden

Undergraduate/
High school: High School Diploma (May 2002)
Texas Academy of Mathematics and Science (TAMS)
2000-2002
GPA: 4.00

TAMS is an in-residence program for students completing their last two years of high school simultaneously with the first two years of college at the University of North Texas, taking honors math, science, and humanities courses with regular university students. Admitted by competitive application.

RESEARCH EXPERIENCE

- Senior Thesis, Department of Control and Dynamical Systems, California Institute of Technology, 2005-2006 Thesis Advisor: Prof. Jerrold Marsden *Calculation of optimal control trajectories for mechanical systems using a direct discretization of the Lagrange D'Alembert principle.*
- Research Associate, Department of Geology and Planetary Science, California Institute of Technology. Prof. Joseph Kirschvink 2002-2005 *Developed Excel based visual basic routines to create sample header files for a magnetometer system and manipulate field data to calculate the necessary quantities, and provide error-checking. Studied human magnetoreception in behavioral shock experiments, using a coil magnetic field setup. Developed software to control the experiments and magnetic field output to coil system. Programmed initial control routines for stepping motors on magnetometer sample changer system. Assisted with initial coding and setup for a computer controlled nitrogen atmosphere oven control system.*
- Summer Undergraduate Research Fellowship, Department of Chemical Engineering, California Institute of Technology. Prof. Mark Davis Summer 2004 *Researched the use of different types of zeolites and zeolite like materials in life saving hemostatic (blood clotting) materials. Experience with Thermogravimetric Analysis and Differential Scanning Calorimeter (TGA/DSC) instrumentation.*
- Research Assistant, Department of Chemistry , University of North Texas Prof. Paul Braterman 2001-2002 *Studied layered double hydroxides (LDH) and their properties. Researched potential catalytic properties of these materials to cyanide polymerization reactions of interest to the origins of life. Experience with scanning electron microscopy (SEM) and x-ray diffraction. Experience with and radiation safety training for neutron diffraction facility at Los Alamos National Laboratory.*

TEACHING EXPERIENCE

- Presenter / Expert Scientist, Caltech Precollege Science Initiative 6/2006 to 8/2006 Coordinator: Prof. Jerry Pine – CAPSI Summer Institute. *Prepared and presented a four week inquiry based learning summer workshop for high school physics teachers. Workshop co-presented by an experienced high school teacher Dave Herman. Was responsible for preparing and leading lectures, activities, and laboratory based problems which exercise inquiry based learning. Lecture material included Multivariable calculus, Differential Equations, Complex variables, Mathematical Modeling, Data and Error analysis (Curve fitting and Forward error propagation), Angular momentum, Simple harmonic motion, Basic electronic circuitry and measurement equipment. Prepared daily discussion activities included wide variety of topics ranging from fluid mechanics to equivalence of electricity and magnetism via special relativity.*

- Teaching Assistant, Department of Control and Dynamical Systems, California Institute of Technology 1/2006 to 3/2006 Instructor: Prof. Richard Murray -- Introductory Control Theory (CDS110b). *Responsible for grading homework and exams, preparing and presenting portions of exam reviews, and holding office hours to answer student questions.*
- Teaching Assistant, Department of Control and Dynamical Systems, California Institute of Technology 9/2005 to 12/2005 Instructor: Prof. Hideo Mabuchi -- Introductory Control Theory (CDS110a) *Prepared and presented one hour of recitation lecture every week containing new material. Lecture material included Linear Systems, Convolution Integrals, MATLAB/Simulink, Liapunov Stability, Jordan Form Theory, Loopshaping, Transfer Functions, Bode and Nyquist plots, and Design examples. Also responsible for grading homework and exams, preparing and presenting portions of exam reviews, and holding office hours to answer student questions.*
- Tutor, California Institute of Technology 2002-2006 *Formal and informal tutoring for peers in wide variety of subjects, including Chemistry, Math, Physics, and Computer Science. Tutor for the Dean's Office 2005-2006.*
- Tutor, Texas Academy of Math and Science 2000-2002

WORKING PAPERS

James Martin, Sina Ober-Blöbaum, and Jerrold E. Marsden. "Applications of DMOC: The Falling Cat." In Progress.

PUBLICATIONS

James Martin. "Discrete Mechanics and Optimal Control." Senior Thesis, Department of Control and Dynamical Systems, California Institute of Technology, 2006.

Jonathan Galownia, James Martin, and Mark E. Davis. "Aluminophosphate-based, microporous materials for blood clotting." *Microporous and Mesoporous Materials*, **92** (2006) p61-63.

COMPUTER SOFTWARE

Test Taker *Client-server testing system that distributes randomized tests, monitors testing, and maintains a database of results. Used successfully in the School for the Talented and Gifted, Dallas, Texas (2002 – present) and Flower Mound High School Flower Mound, Texas (2000 – 2002). Experience writing and maintaining software containing several thousand lines of code.*

HONORS AND AWARDS:

2007-Current	Computational Science Graduate Fellowship (CSGF) - United States Department of Energy
2006-2007	Computational and Applied Mathematics Graduate Fellowship
2005-2006	Richard L. and Dorothy M. Hayman Scholarship
2004-2006	Robert Bump Memorial Scholarship
2004, 2003	Caltech Summer Undergraduate Research Fellowship (SURF)
2003-2004	Associates Endowed Undergraduate Scholarship
2002	University of North Texas Freshman Chemistry Award Amateur Radio Relay League Scholarship
2002	National Merit Finalist
2000	Texas State University Interscholastic League Computer Science winner, 1 st place

PROFESSIONAL CERTIFICATIONS

1999	Computing Technology Industry Association (CompTIA) A+ Certification <i>The CompTIA A+ certification is an international industry credential that validates the knowledge of computer service technicians with the equivalent of 500 hours of hands-on experience.</i> http://www.comptia.org/certification/a/default.aspx
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SELECTED PERSONAL INFORMATION

Racquetball, Amateur Radio Operator – Amateur Extra License