

Michael B. Hay

Ph.D. Candidate
Program in Environmental Engineering & Water Resources
Princeton University

Education

Fall 2000 B.S. Engineering Physics, Materials Science Engineering Focus, Math Minor
Summa Cum Laude and Honors
University of Arizona, Tucson, Arizona

Research Experience

- 2001-Present Research Assistant for Prof. Satish Myneni
Department of Geosciences, Princeton University
- Research projects include X-ray spectroscopy of liquid water at interfaces, studying functional group chemistry of natural organic molecules / speciation of organic-associated elements, and characterizing natural organic molecule / mineral surface interactions.
 - Maintain laboratory equipment (FTIR, fluorescence spectrometer, computers), design and maintain the Myneni group webpage.
- 2000-2001 Research Assistant for Prof. Srinivas Manne
Department of Physics, University of Arizona
- Performed Atomic Force Microscope studies of cation substitution in calcite crystals.
 - Developed Mathematica models to compute energy minimization of a sphere lattice / surface system, with application to the self-assembly of spherical micelles.
 - Designed and constructed a large-scale mechanical model for the study of 2D colloidal behavior.
- 1997-2000 Data Processing Assistant for Dr. Lyle Broadfoot
Lunar and Planetary Lab, University of Arizona
- Analyzed airglow and ultraviolet star spectroscopic data collected from Space Shuttle based instruments.
 - Created CD-ROM archives of mission data.

Teaching / Leadership Experience

- 2000 Science Team Leader for the Student Satellite Project
University of Arizona
- Managed a group of approximately 10 people; created tasks, assigned duties and monitored progress on a weekly basis.
 - Maintained communication between Science and other project sub teams.

- 1999 Physics Lab Instructor
 Department of Physics, University of Maine
- Taught one laboratory section of 2nd semester introductory level physics.
 - Graded lab reports.
- 1998 Physics Tutor
 Onward Tutor Program, University of Maine
- Assisted two groups of four 1st semester introductory level physics students on a biweekly basis.
 - Achieved Level 1 College Reading and Learning Association (CRLA) tutor certification.

Honors / Activities

- 2002 Recipient, Environmental Protection Agency Science to Achieve Results (EPA-STAR) Graduate Research Fellowship
- 2001 Recipient, National Science Foundation Graduate Research Fellowship
 Recipient, Gordon Wu Fellowship, School of Engineering and Applied Sciences, Princeton University
 Race strategy specialist, Arizona Solar Racing Team, University of Arizona
- 1st place team in Stock Class, American Solar Challenge, July 2001.
- 2000 College of Engineering Outstanding Senior, fall graduating class, University of Arizona
 Weaver Award for Undergraduates Scholarship, Dept. of Physics, UA
 Royal Stark (Advanced Physics Lab performance) Scholarship, Dept. of Physics, UA
 Van de Verde Undergraduate Research Scholarship, College of Science, UA
 Honors College Undergraduate Research Grant, UA
- 1999 Tau Beta Pi: Engineering Honor Society
 Sigma Pi Sigma: Physics Honor Society
 Member, Society of Physics Students

Publications

Hay M.B., Workman R.K., Manne S. (2003) Mechanisms of metal ion sorption on calcite: composition mapping by lateral force microscopy. *Langmuir* **19**, 3727-3740

Hay M.B., Workman R.K., Manne S. (2003) Two-dimensional condensed phases from particles with tunable interactions. *Phys. Rev. E* **67** (1), Art. No. 012401