

Stewart A. Mallory

PH.D CANDIDATE · CACCIUTO RESEARCH GROUP

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Education

Columbia University in the City of New York

Fall 2012 - Present

PH.D. CANDIDATE AND DEAN'S FELLOW IN CHEMICAL PHYSICS

THESIS: *An active approach to colloidal self-assembly*

University of Hawai'i at Manoa

Spring 2007 – Fall 2011

B.S. IN CHEMISTRY (*Magna Cum Laude*)

B.A. IN MATHEMATICS (*Magna Cum Laude*)

Research Experience

Graduate Research Assistant

Fall 2012 - Present

CACCIUTO RESEARCH GROUP - DEPARTMENT OF CHEMISTRY

Columbia University

- Using a combination of computer simulations and analytical theory, I have looked to provide quantitative answers to several fundamental questions concerning the phase behavior and material properties of active colloids.

Molecular Science Intern

Summer 2011

INTERNATIONAL SPECIALTY PRODUCTS CORPORATION

Wayne, NJ

- Development of eco-friendly anti-agglomerants capable of hindering the formation of natural gas clathrates in oil pipelines.

Summer Researcher

Summer 2010

NSF RESEARCH EXPERIENCE FOR UNDERGRADUATES IN SOFT MATERIALS

Pennsylvania State University

- As part of the Jensen Research Group, conducted a theoretical study of resonance Raman scattering of dye-sensitized titanium dioxide nanoparticles using time dependent DFT.

Undergraduate Research Assistant

Spring 2009 - Fall 2011

HEAD RESEARCH GROUP - DEPARTMENT OF CHEMISTRY

University of Hawai'i at Manoa

- DFT investigation of small molybdenum disulfide nanoclusters with application to desulfurization catalysis.

Undergraduate Research Assistant

Spring 2008 - Spring 2011

THIN FILMS LABORATORY

Hawai'i Natural Energy Institute

- Fabrication and optimization of CIGS solar cells and photoelectrochemical water splitting devices.

Teaching Experience

Graduate Teaching Assistant

Summer 2014

PARK CITY MATH INSTITUTE

Institute for Advanced Study

- Led discussion and problem sessions on Statistical Mechanics as part of the Graduate Summer School

Graduate Teaching Assistant

DEPARTMENT OF CHEMISTRY

- Course: Graduate Statistical Mechanics I & II

Fall 2013 & Spring 2014

Columbia University

Laboratory Instructor

SCIENCE HONORS PROGRAM

- Co-Instructor of a Saturday morning Organic Chemistry class specifically designed for high school students.

Fall 2013 - Present

Columbia University

Undergraduate Teaching Assistant

DEPARTMENT OF CHEMISTRY

- Course: Physical Chemistry II – Quantum Mechanics

Spring 2013

Columbia University

Undergraduate Laboratory Teaching Assistant

DEPARTMENT OF CHEMISTRY

- Course: Organic Chemistry Laboratory

Fall 2012

Columbia University

Honors & Awards

Graduate

JACK MILLER TEACHING AWARD

2013

NATIONAL SCIENCE FOUNDATION GRADUATE RESEARCH FELLOWSHIP

2012

Undergraduate

MAGISTAD AWARD: OUTSTANDING CHEMISTRY GRADUATE

2011

PHI BETA KAPPA

2011

SOCIETY OF CHEMICAL INDUSTRY SCHOLAR

2011

SHIGEO & HATSU IWAMOTO SCHEUER FOR OUTSTANDING CHEMISTRY MAJOR

2009

UNIVERSITY OF HAWAI'I SYSTEM PRESIDENTIAL SCHOLARSHIP FINALIST

2008

DEPARTMENTAL ACADEMIC ACHIEVEMENT SCHOLARSHIP IN BIOLOGY

2007, 2008

MEMBER OF THE STUDENT EMPLOYEE TEAM OF THE YEAR

2007, 2008

Student Mentoring

Elliot Taffet – UNDERGRADUATE RESEARCH STUDENT AT COLUMBIA UNIVERSITY

2013 - 2014

Project: Dynamics of two dimensional active crystals

David Melnekoff – UNDERGRADUATE RESEARCH STUDENT AT COLUMBIA UNIVERSITY

2013 - 2014

Project: Self-assembly and dynamics of active matchstick colloids

Outreach Activities

DOUBLE DISCOVERY CENTER - COLUMBIA UNIVERSITY

2016

COLUMBIA UNIVERSITY SCIENCE HONORS PROGRAM

2013 - Present

SCIENCE SATURDAY STARTERS (S3)

2013

SUMMER PROGRAM FOR HIGH SCHOOL STUDENTS AT COLUMBIA UNIVERSITY

2012 - 2016

GIRLS' SCIENCE DAY AT COLUMBIA UNIVERSITY

2012 - 2014

INTRODUCE A GIRL TO ENGINEERING DAY

2010

Workshops, Schools, & Conferences

THE BERKELEY STATISTICAL MECHANICS MEETING	Spring 2017
THE BOULDER SCHOOL IN CONDENSED MATTER AND MATERIALS PHYSICS Topic: Soft Matter In and Out of Equilibrium	Summer 2015
GRADUATE SUMMER SCHOOL AT IAS PARK CITY MATH INSTITUTE Topic: Mathematics and Materials	Summer 2014

Committees

Secretary – PHYSICAL CHEMISTRY SEMINAR SERIES AT COLUMBIA UNIVERSITY	2014-2016
Treasurer – PHYSICAL CHEMISTRY SEMINAR SERIES AT COLUMBIA UNIVERSITY	2014-2016

Presentations & Posters

Presentation – INVITED TALK - UNIVERSITY OF CALIFORNIA BERKELEY	2017
Presentation – PHYSICAL CHEMISTRY SEMINAR SERIES AT COLUMBIA UNIVERSITY	2016
Poster – BOULDER SCHOOL FOR CONDENSED MATTER AND MATERIALS PHYSICS	2015
Poster – WORLD CONGRESS OF WATOC	2011
Poster – 14TH INTERNATIONAL CONGRESS OF QUANTUM CHEMISTRY	2011
Presentation – INTERNATIONAL SPECIALTY PRODUCTS SUMMER SYMPOSIUM	2011
Poster – 35TH IEEE PHOTOVOLTAIC SPECIALISTS CONFERENCE (PVSC)	2010
Poster & Presentation – PENN STATE REU SUMMER RESEARCH SYMPOSIUM	2010

Publications

13. **Mallory, S. A.**, Valeriani, C., & Cacciuto, A. (2016). Phase behavior of active inverse patchy colloids. (*In preparation*).
12. **Mallory, S. A.**, Valeriani, C., & Cacciuto, A. (2017). Review: An active approach to colloidal self-assembly. *Annual Review of Physical Chemistry* (*In preparation*).
11. Harder, J., **Mallory, S. A.**, Valeriani, C., & Cacciuto, A. (2016). Hierarchical self assembly of colloidal rotors. (*In preparation*).
10. **Mallory, S. A.**, Valeriani, C., & Cacciuto, A. (2016). Emergent global motion of active dipolar janus colloids near a charged surface. (*In preparation*).
9. **Mallory, S. A.**, Valeriani, C., & Cacciuto, A. (2016). Phase behavior of active amphiphilic janus colloids. (*In preparation*).
8. Chambers, M., **Mallory, S. A.**, Malone, H., Gao, Y., Anthony, S., Yi, Y., Cacciuto, A., & Yu, Y. (2016). Lipid membrane-assisted condensation and assembly of amphiphilic janus particles. *Soft Matter*, 12(45), 9151-9157.
7. **Mallory, S. A.**, & Cacciuto, A. (2016). Activity-assisted self-assembly of colloidal particles. *Physical Review E*, 94(2), 022607.
6. **Mallory, S. A.**, Valeriani, C., & Cacciuto, A. (2015). Anomalous dynamics of an elastic membrane in an active fluid. *Physical Review E*, 92(1), 012314.
5. Harder, J., **Mallory, S. A.**, Tung, C., Valeriani, C., & Cacciuto, A. (2014). The role of particle shape in active depletion. *The Journal of chemical physics*, 141(19), 194901.
4. **Mallory, S. A.**, Valeriani, C., & Cacciuto, A. (2014). Curvature-induced activation of a passive tracer in an active bath. *Physical Review E*, 90(3), 032309.

3. **Mallory, S. A.**, Šarić, A., Valeriani, C., & Cacciuto, A. (2014). Anomalous thermomechanical properties of a self-propelled colloidal fluid. *Physical Review E*, 89(5), 052303.
2. Kowalczyk, J., Perkins, J. J., DeAngelis, A., Kaneshiro, J., **Mallory, S. A.**, Chang, Y., & Gaillard, N. (2013). Bulk measurement of copper and sodium content in CuIn (0.7) Ga (0.3) Se (2)(CIGS) solar cells with nanosecond pulse length laser induced breakdown spectroscopy (LIBS). *arXiv preprint arXiv:1301.1313*.
1. Miller, E. L., DeAngelis, A., & **Mallory, S. A.** (2012). Multijunction approaches to photoelectrochemical water splitting. In *Photoelectrochemical Hydrogen Production* (pp. 205-273). Springer US.