

Jovana Andrejevic | Curriculum Vitae

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Education.....

Harvard University, School of Engineering and Applied Sciences

Pursuing a Ph.D. in Applied Physics

Advisor: Professor Christopher H. Rycroft

GPA: 3.97/4.0

Cambridge, MA

2016–2022 (expected)

Cornell University, College of Engineering

Bachelor of Science in Engineering Physics | Minor in Applied Mathematics

GPA: 4.19/4.30

Ithaca, NY

2012–2016

Research Experience.....

Doctoral Student

Rycroft Group | Harvard University

Cambridge, MA

2016–present

Studied the crumpling dynamics of thin, elastoplastic sheets through both data-driven and simulation-based approaches. Applied mathematical modeling and machine learning methods to characterize the structure and evolution of complex ridge networks observed in experimental crumpling data. Developed a mesh-based simulation of thin sheets to examine diverse crumpled geometries which reproduce experimental phenomena.

Undergraduate Researcher

Clancy Group | Cornell University

Ithaca, NY

2014–2016

Performed computational studies of PbS quantum dots as prospective semiconducting materials in the manufacture of solar cells. Developed models of quantum dot interaction, with applications of Density Functional Theory (DFT) and Molecular Dynamics (MD). Gained exposure to computational physics research as well as experience with DFT and MD software.

Undergraduate Researcher, SROP

Velasco Group | Northwestern University

Evanston, IL

Summer 2015

Engaged in experimental research in the field of high-energy physics relevant to the Compact Muon Solenoid (CMS) detector of the Large Hadron Collider. Investigated improvements to two components of the detector design: refining the calorimeter data acquisition system and evaluating a two-phase carbon dioxide cooling system that can better mitigate sensor damage. Employed skills in data collection and analysis using programming tools, as well as gained familiarity with both hardware design and software development.

Teaching Experience.....

Workshop Co-Instructor

Massachusetts Institute of Technology

Cambridge, MA

Winter 2020, 2021

Workshop Title: Generative Art

Workshop Organizers: Jovana and Nina Andrejevic, Amina Matt, George Varnavides

Graduate Teaching Fellow

Harvard University, School of Engineering and Applied Sciences

Course Title: Applied Math 205 - Advanced Scientific Computing: Numerical Methods

Course Heads: Prof. Chris Rycroft

Cambridge, MA

Fall 2020, 2021

Graduate Teaching Fellow

Harvard University, School of Engineering and Applied Sciences

Course Title: Engineering Sciences 301 - SEAS Teaching Practicum

Course Head: Dr. John Girash

Cambridge, MA

Fall 2019

Head Graduate Teaching Fellow

Harvard University, School of Engineering and Applied Sciences

Course Title: Applied Physics 50B - Physics as a Foundation for Science and Engineering II

Course Heads: Prof. Eric Mazur and Prof. Federico Capasso

Cambridge, MA

Spring 2018

Graduate Teaching Fellow

Harvard University, School of Engineering and Applied Sciences

Course Title: Applied Physics 50A - Physics as a Foundation for Science and Engineering I

Course Heads: Dr. Kelly Miller and Prof. Philippe Cluzel

Cambridge, MA

Fall 2017

Undergraduate Teaching Assistant

Cornell University, Department of Physics

Course Title: Physics 1101/1102 - General Physics I and II

Course Head: Prof. Alan Giambattista

Ithaca, NY

Fall 2013–Spring 2016

Undergraduate Teaching Assistant

Cornell University, Department of Physics

Course Title: Physics 1112/2213 - Physics I and II for Engineers

Course Head: Prof. Robert Thorne

Ithaca, NY

Spring 2013–Spring 2014

Publications.....

Jovana Andrejevic, Lisa M Lee, Shmuel M Rubinstein, and Chris H Rycroft. A model for the fragmentation kinetics of crumpled thin sheets. *Nature Communications*, 12(1):1–10, 2021.

Jordan Hoffmann*, Yohai Bar-Sinai*, Lisa M Lee, Jovana Andrejevic, Shruti Mishra, Shmuel M Rubinstein, and Chris H Rycroft. Machine learning in a data-limited regime: Augmenting experiments with synthetic data uncovers order in crumpled sheets. *Science Advances*, 5(4):eaau6792, 2019.

Omer Gottesman, Jovana Andrejevic, Chris H Rycroft, and Shmuel M Rubinstein. A state variable for crumpled thin sheets. *Communications Physics*, 1(1):1–7, 2018.

Jovana Andrejevic, James Stevenson, and Paulette Clancy. Simple molecular reactive force field for metal–organic synthesis. *Journal of Chemical Theory and Computation*, 12(2):825–838, 2016.

Preprints.....

Jovana Andrejevic and Chris H Rycroft. Simulation of crumpled sheets via alternating quasistatic and dynamic representations. *arXiv preprint arXiv:2112.13268*, 2021.

Nina Andrejevic*, Jovana Andrejevic*, Chris H Rycroft, and Mingda Li. Machine learning spectral indicators of topology. *arXiv preprint arXiv:2003.00994*, 2020.

Conferences and Seminars.....

A fragmentation-based model for the crumpling of thin sheets. *APS March Meeting (virtual)*, 2021.

Order in disorder: Modeling the crumpling dynamics of thin sheets. *AEP Seminar, Cornell University (virtual)*, 2021.

Order in disorder: Modeling the crumpling dynamics of thin sheets. *IMA Data Science Seminar, University of Minnesota (virtual)*, 2021.

Facets and folds: A model for fragmentation kinetics of crumpled thin sheets. *APS March Meeting (virtual)*, 2020.

A computational model for crumpled thin sheets to complement data-driven machine learning. *APS March Meeting, Boston, MA*, 2019.

Detection and characterization techniques for signatures of crumpling history. *APS March Meeting, Los Angeles, CA*, 2018.

Honors and Awards.....

White Teaching Prize

Harvard University, Department of Physics

2018, 2019

Data Science Animation Contest 1st Place Winner

Harvard University

2019

National Science Foundation Graduate Fellowship

National Science Foundation (NSF)

2016-2021

Dorothy & Fred Chau Award for Excellence in Undergraduate Research

Cornell University, School of Applied and Engineering Physics

2016

Paul L. Hartman Award for Excellence in Experimental Physics

Cornell University, School of Applied and Engineering Physics

2016

Undergraduate Research Scholarships

GLOBALFOUNDRIES & SRC

2016

International Mathematical Contest in Modeling

COMAP, Meritorious (2015, 2016) | Honorable Mention (2014)

2014-16

Cornell Mathematical Contest in Modeling

Cornell University, 1st place (2014) | 2nd place (2013) | 3rd place (2015)

2013-15

Undergraduate Research Grant

SEC and Intel Foundation

2015

College of Engineering Alumni Association (CEAA) Research Award

Cornell University, College of Engineering

2015

Class of 1960 Women in Support of Education Scholarship

Cornell University

2013-15

Frank and Rosa Rhodes Scholarship

Cornell University

2014

Distinguished Undergraduate TA Award

Cornell University, Department of Physics

2013

Appearances

“Order in Disorder: Uncovering the Mathematical Rules of Crumpling”

Girls' Angle Bulletin, Vol. 14 No. 5 & 6 | Editor: Amanda Galtman

August 2021

“How Paper Crumples”

Harvard Magazine | Author: Steve Nadis

June 2021

“The Math of a Crumpled Piece of Paper is Insanely Important. No, Seriously.”

Popular Mechanics | Author: Courtney Linder

April 2021

“Crumple Theory: We Can Learn a Lot From How Paper Crumples”

HowStuffWorks | Author: Patrick J. Kiger

April 2021

“The Latest Wrinkle in Crumple Theory”

The New York Times | Author: Siobhan Roberts

March 2021

“Top of Mind with Julie Rose”, Episode: 1576

BYU Radio, SiriusXM | Interviewer: Julie Rose

March 2021

“Rock, paper, crumple!”

Harvard SEAS News | Author: Leah Burrows

March 2021

“Grad student profile: Jovana Andrejevic”

Harvard SEAS News | Author: Adam Zewe

July 2018

Leadership Experience

Graphics Director

Harvard Science in the News

Cambridge, MA

2019-Present

Manage a team of 15 graphic designers in creating visuals for blogs, seminars, and other content to promote science communication.

Pedagogy Fellow

Harvard University, School of Engineering and Applied Sciences

Cambridge, MA

2019

Led micro-teaching sessions and individual teaching consultations for approximately 100 graduate students over two semesters and organized three pedagogy journal clubs.

Program Manager

Cornell University, Community Center Programs

Ithaca, NY

2014-2016

Designed and led community-oriented programs each week to promote involvement and interaction among diverse student groups on campus.

Outreach Co-Chair

Cornell University, Society of Women Engineers

Ithaca, NY**2012**

Designed and supervised science projects at 3 local elementary and middle schools for classes of approximately 20 students.