Jovana Andrejevic | Curriculum Vitae

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Education

Harvard University, School of Engineering and Applied Sciences — **Cambridge, MA**
Pursuing a Ph.D. in Applied Physics — *2016–2022 (expected)*
Advisor: Professor Christopher H. Rycroft
GPA: 3.97/4.0

Cornell University, College of Engineering — **Ithaca, NY**
Bachelor of Science in Engineering Physics | Minor in Applied Mathematics — *2012–2016*
GPA: 4.19/4.30

Research Experience

Doctoral Student — **Cambridge, MA**
Rycroft Group | Harvard University — *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 — **Ithaca, NY**
Clancy Group | Cornell University — *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 — **Evanston, IL**
Velasco Group | Northwestern University — *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 — **Cambridge, MA**
Massachusetts Institute of Technology — *Winter 2020, 2021*
Workshop Title: Generative Art
Workshop Organizers: Jovana and Nina Andrejevic, Amina Matt, George Varnavides

Graduate Teaching Fellow **Cambridge, MA**
Harvard University, School of Engineering and Applied Sciences *Fall 2020, 2021*
Course Title: Applied Math 205 - Advanced Scientific Computing: Numerical Methods
Course Heads: Prof. Chris Rycroft

Graduate Teaching Fellow **Cambridge, MA**
Harvard University, School of Engineering and Applied Sciences *Fall 2019*
Course Title: Engineering Sciences 301 - SEAS Teaching Practicum
Course Head: Dr. John Girash

Head Graduate Teaching Fellow **Cambridge, MA**
Harvard University, School of Engineering and Applied Sciences *Spring 2018*
Course Title: Applied Physics 50B - Physics as a Foundation for Science and Engineering II
Course Heads: Prof. Eric Mazur and Prof. Federico Capasso

Graduate Teaching Fellow **Cambridge, MA**
Harvard University, School of Engineering and Applied Sciences *Fall 2017*
Course Title: Applied Physics 50A - Physics as a Foundation for Science and Engineering I
Course Heads: Dr. Kelly Miller and Prof. Philippe Cluzel

Undergraduate Teaching Assistant **Ithaca, NY**
Cornell University, Department of Physics *Fall 2013–Spring 2016*
Course Title: Physics 1101/1102 - General Physics I and II
Course Head: Prof. Alan Giambattista

Undergraduate Teaching Assistant **Ithaca, NY**
Cornell University, Department of Physics *Spring 2013–Spring 2014*
Course Title: Physics 1112/2213 - Physics I and II for Engineers
Course Head: Prof. Robert Thorne

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

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 **Cambridge, MA**
Harvard Science in the News *2019-Present*
Manage a team of 15 graphic designers in creating visuals for blogs, seminars, and other content to promote science communication.

Pedagogy Fellow **Cambridge, MA**
Harvard University, School of Engineering and Applied Sciences *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 **Ithaca, NY**
Cornell University, Community Center Programs *2014-2016*
Designed and led community-oriented programs each week to promote involvement and interaction among diverse student groups on campus.

Outreach Co-Chair **Ithaca, NY**
Cornell University, Society of Women Engineers *2012*

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