Adrienne M. Propp

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STANFORD UNIVERSITY   Palo Alto, CA
Ph.D. in Computational and Mathematical Engineering   Current

UNIVERSITY of OXFORD   Oxford, United Kingdom
M.Sc. in Mathematical Modelling and Scientific Computing   November 2018
Dissertation title: "Simulating 3D Orthotropic Cardiac Electromechanics Incorporating
Stress-Assisted Diffusion," supervised by Professor Ricardo Ruiz-Baier

HARVARD UNIVERSITY   Cambridge, MA
B.A. in Applied Mathematics; Magna Cum Laude with High Honors   May 2017
Honors thesis title: "MethaneSat: Detecting Methane Emissions in the Barnett Shale Region,"
supervised by Professor Steven C. Wofsy and Dr. Joshua Benmergui

Academic & Professional Experience

PhD Candidate – Stanford University   Sep 2021 – Current
- Developing machine-learned surrogate models to improve the efficiency of solving multiscale PDEs for applications such as climate modeling (with Daniel Tartakovsky)
- Designing algorithms to improve upon randomized control trials in data-poor environments (with Susan Athey)
- Mathematical modeling to understand the processes leading to volcanic eruptions (with Jenny Suckale)

Technical Analyst – RAND Corporation   Jan 2019 – Sep 2021
- Development of Markov Chain Monte Carlo models in R to study the impact of healthcare reform, alcohol use and dependence; network analysis in Python to examine ally relationships along economic, diplomatic, and military lines; theoretical examination and implementation of adversarial AI techniques such as model stealing, model inversion, and membership inference; modeling rapid decision-making under uncertainty
- Advised state-level policymakers on modeling the COVID-19 pandemic
- Project manager of the TALIS Video Study and Global Teaching Insights

Researcher – Wofsy Lab, Harvard University Dept. of Earth & Planetary Sciences   Jan 2016 – Sep 2017
- Implemented large-scale inversions (Observation System Simulation Experiments) using Python and Odyssey (Harvard's supercomputer cluster) to quantify a proposed satellite's ability to constrain methane emissions

Teaching Fellow – Harvard University Dept. of Applied Mathematics   Aug 2015 – Dec 2017
- Teaching Fellow in multivariable calculus (AM21a) and differential equations (AM105)

SULI DOE Intern – Glenzer Lab, SLAC National Accelerator Laboratory   June 2015 – Aug 2015
- Helped develop cryogenic hydrogen microjet targets for ion acceleration from laser-plasma interaction; managed ion spectrometers and radiochromic film diagnostics during experiments at LLNL Jupiter Laser Facility

Peer-Reviewed Publications

Propp, Adrienne, Alessio Gizzi, Francesc Levrero-Florencio, and Ricardo Ruiz-Baier. (2019). "An orthotropic electro-viscoelastic model for the heart with stress-assisted diffusion." Biomechanics and Modeling in Mechanobiology. https://doi.org/10.1007/s10237-019-01237-y.

Gauthier, M. et al. [**including Propp, A**] (2016). "High intensity laser-accelerated ion beam produced from cryogenic micro-jet target". AIP Review of Scientific Instruments. https://doi.org/10.1063/1.4961270.

Chen, S. N. et al. [**including Propp, A**] (2016). "Absolute dosimetric characterization of Gafchromic EBT3 and HDv2 films using commercial flat-bed scanners and evaluation of the scanner response function variability". AIP Review of Scientific Instruments. https://doi.org/10.1063/1.4954921.

RAND Reports

Kapinos, Kandice, Carter Price, Drew Anderson, **Adrienne Propp**, Raffaele Vardavas, and Christopher Whaley (2020). "Analysis of the 10Plan: A Self-Pay System Designed to Minimize the Burden of Health Care Costs." RAND Corporation. https://www.rand.org/pubs/research_reports/RR4270.html.

Price, Carter, Kelly Klima, **Adrienne Propp**, and Sean Colbert-Kelly (2020). "A Model of the Spread of the COVID-19 Pandemic During a Hurricane in Virginia." RAND Corporation. https://www.rand.org/pubs/research_reports/RRA323-2.html.

Price, Carter, and **Adrienne Propp** (2020). "A Framework for Assessing Models of the COVID-19 Pandemic to Inform Policymaking in Virginia." RAND Corporation. https://www.rand.org/pubs/research_reports/RRA323-1.html.

Conferences / Workshops

Propp, Adrienne. "Transfer learning for surrogate models of PDEs." Mathematical and Scientific Machine Learning, ICERM (*Invited talk*, 2023).

Suckale, Jenny, **Propp, Adrienne**, and Iacovino, Kayla. "Towards a process-based understanding of deflation-inflation events and associated lava fountaining at Kilauea volcano." American Geophysical Union (AGU) Fall Meeting (2022).

Propp, Adrienne, Price, C., Vardavas, R., Kapinos, K. "Dynamic microsimulation modeling for healthcare expenditures." Conference of the American Society of Health Economists (ASHEcon) (*Contributed talk*, 2021).

Gizzi, A., **Propp, Adrienne**, and Ruiz-Baier, R. "Mixed formulations for stress-assisted diffusion problems in cardiac biomechanics." International Conference on Numeric Analysis, Computing and Application in Science Engineering and Technology (2018).

Propp, Adrienne et al. "MethaneSat: Detecting methane emissions in the Barnett Shale region." American Geophysical Union (AGU) Fall Meeting (*Contributed talk*, 2017).

Benmergui, Joshua et al. [**including Propp, A**]. "Background concentrations for high resolution satellite observing systems of methane." American Geophysical Union (AGU) Fall Meeting (2017).

Curry, Chandra et al. [**including Propp, A**]. "Deflection of laser accelerated protons due to multi-megagauss magnetic fields in high-intensity laser-plasma interactions." IEEE International Conference on Plasma Science (2016).

Propp, Adrienne et al. "Development of and laser-driven proton acceleration from a cryogenic hydrogen microjet." 3rd High-Power Laser Workshop at SLAC National Accelerator Laboratory (*Poster*, 2015).

Curry, Chandra et al. [**including Propp, A**]. "Spectral Features in Laser Driven Proton Acceleration from Cylindrical Solid-density Hydrogen Jets." 57th Annual Meeting of the APS Division of Plasma Physics (2015).

Gauthier, Maxence et al. [**including Propp, A**]. "Proton shock acceleration using a high contrast high intensity laser." 57th Annual Meeting of the APS Division of Plasma Physics (2015).

Kim, Jongjin et al. [**including Propp, A**]. "Laser-driven proton and deuteron acceleration from a pure solid- density H2/D2 cryogenic jet." 57th Annual Meeting of the APS Division of Plasma Physics (2015).

Awards & Fellowships

ICME Student Leadership Award, Stanford University	May 2023
Stanford Graduate Fellowship	Sep 2021
Enhancing Diversity in Graduate Education (EDGE) Fellowship, Stanford University	Sep 2021
RAND Corporation Spotlight Award	April 2020
Distinction on M.Sc. dissertation, Oxford Mathematical Institute	Sep 2018
Magna Cum Laude, Harvard University	May 2017
Certificate of Distinction in Teaching, Harvard University	May 2016
Certificate of Distinction in Teaching, Harvard University	Dec 2016
Harvard College Scholar	May 2014
"Hanging Jig," U.S. Patent D679,613 S	April 2013

Skills

Technical (in order of proficiency)**:** Python, R, Stata, C++, MATLAB, SQL, C, Mathematica, AMPL, PHP, JavaScript
Language: English (native), French (B2), Spanish (B1)
Other: Git, vim, LaTeX, ArcGIS

Service

Referee: International Journal for Uncertainty Quantification
Stanford Women in Mathematics, Statistics, and Computational Engineering (WiMSCE) –

Board member, Events and Outreach Committee	May 2023 – Current
Member	Sep 2021 – May 2023
Corpus Christi College Social Officer, Oxford University	Nov 2017 – Sep 2018

Activities & Interests

Scuba diving, dance, hiking, rock climbing, surfing, skiing, painting, travel