

# ELLA M. KING

617-997-7200 ◊ ellaking@g.harvard.edu

## EDUCATION

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**Harvard University** September 2018 - June 2023 (Expected)  
Physics Ph.D. Candidate, National Science Foundation (NSF) Fellow

**Stanford University** September 2014 - June 2018  
Physics B.S., Math Minor

## RESEARCH EXPERIENCE

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**Graduate Student Researcher** January 2019 - Present  
*Advisor: Michael Brenner, Harvard University*

Inverse design of functional materials; Development of novel computational tools for experimental particle tracking and measuring interaction potentials.

**Rotation Student Researcher** September 2018 - January 2019  
*Advisor: Vinodhan Manoharan, Harvard University*

TEM imaging of virus particles; Viral assembly under varying solvent conditions

**Undergraduate Researcher** June 2016 - June 2018  
*Advisor: Nicholas Melosh, Stanford University*

Computational studies of the impact of molecular rigidity on diamondoid self-assembly

**CERN REU Student** June 2017 - August 2017  
*Advisor: Philip Harris, CERN*

Predicting rates of Higgs invisible decays at the Future Circular Collider

## PUBLICATIONS AND PREPRINTS

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**King, E. M.**, Du, C.X., Brenner, M.P. "Programmable patchy particles for materials design". *In prep; Preprint available upon request.*

Kimchi, O., **King, E. M.**, and Brenner, M.P. "Uncovering the mechanism for aggregation in repeat expanded RNA reveals a reentrant transition." *bioRxiv* (2022). *Under revision at Nature Communications*

**King, E. M.**<sup>†</sup>, Wang, W., Weitz, D. A., Spaepen, F., & Brenner, M.P. "Correlation Tracking: Using simulations to interpolate highly correlated particle tracks." *Physical Review E* 105.4 (2022): 044608.

Goodrich, C. P.\*<sup>\*</sup>, **King, E. M.**<sup>\*</sup>, Schoenholz, S. S., Cubuk, E. D., & Brenner, M. P. (2021). Designing self-assembling kinetics with differentiable statistical physics models. *Proceedings of the National Academy of Sciences*, 118(10).

**King, E. M.**, Gebbie, M. A., & Melosh, N. A. (2019). Impact of Rigidity on Molecular Self-Assembly. *Langmuir*, 35(48), 16062-16069.

\*Co-first author publication

<sup>†</sup> Corresponding author

## HONORS AND AWARDS

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|  |                            |
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| <b>Rising Stars in Soft and Biological Materials Symposium</b> | Oct 6-7 2022               |
| <b>NSF Graduate Research Fellow</b>                            | Tenure in 2019, 2020, 2023 |
| <b>Two Sigma PhD Fellowship Finalist</b>                       | 2020-2021                  |
| <b>Certificate of Distinction in Teaching</b>                  | Fall 2020                  |

## PRESENTATIONS

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Using simulation to interpolate highly correlated particle tracks *Beg Rohu Summer School; St. Pierre Quiberon, France* (Poster; June 2022)

Designing kinetic features of self assembly *Geilo School; Geilo, Norway* (Poster; March, 2022)

Inverse design of nucleation seeds *APS March Meeting, Chicago IL* (Talk; March, 2022)

Tuning Kinetic Properties of Self-Assembled Systems *APS March Meeting; Virtual* (Talk; March, 2021)

Applications of Automatic Differentiation to Materials Design; *APS March Meeting; Boulder, CO* (Talk; March, 2020) [Canceled]

Higgs Invisible Decays at the FCC: Higgs Production via Vector Boson Fusion. *UMichigan CERN REU Program* (Talk; August, 2017)

Quantifying the Entropy of Diamondoids: An Alternate Explanation for Ordered Properties of Diamondoids. *Stanford Materials Science Summer Research Program* (Poster; August, 2016)

## TEACHING

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Teaching Fellow for Applied Math 201: Physical Mathematics I (Fall 2020). Course given online. Ran sections, graded, aided in course organization. Awarded Certificate of Distinction in Teaching for work in this course.

## OUTREACH AND MENTORSHIP

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- Outreach Director and board member for WoWSTEM: Communicated with press outlets, organized advertising, and edited blog posts for wowstem.org, a website aimed at making advanced STEM topics accessible to middle and high school girls
- Member of Women in Physics at Harvard: created and ran an annual website-making event for undergraduate and graduate women, helped organize a workshop on Building Inclusive Community
- Mentored three undergraduate women in physics at Harvard as a part of the Polaris mentorship program; Developed programming and recruited graduate mentors for Polaris
- Member of a working group that started a postbac program for underrepresented students as a part of the Diversity, Inclusion and Belonging committee at Harvard
- Co-founder of PUWMAS, the Stanford undergraduate community for women and gender minorities in physics: began a mentorship program for undergraduates in 2017 that has continued to the present