

Asja Radja

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NSF-Simons Research Fellow, Harvard University

**Research interests:** To advance the application of statistical mechanics and computational modeling to evolutionary biology by employing field work, experimental imaging, and phenomenological modeling which, when combined, reveal rules of biological self-assembly that generate complex morphologies seen in a multitude of living matter systems.

## Education

University of Pennsylvania, PhD in Physics, 2019

University of Pennsylvania, MS in Physics, 2015

University of Texas at Dallas, BS in Physics and Biochemistry, 2013

## Fellowships & Awards

**NSF-Simons Independent Fellow at Harvard, 2020-2022**

Schmidt Science Fellow, 2019

The Herbert B. Callen Memorial Prize, 2019

Finalist in Wikipedia Science Photo Competition (US), 2018

Dean's Award for Distinguished Teaching by Graduate Student, 2017

Presidential Achievement Scholarship, 2012

Patty Henry Pinch Scholarship, 2012

Undergraduate Research Award, 2011

Academic Excellence Scholarship, 2008-2013

## Publications

*A. Radja and A. Sweeney. "Phaeodarian collection and quantification of silica test" (in preparation)*

*A. Radja and N. Rodriguez. "A model for Sea fan and Gorgonian network diversity" (in preparation)*

**A. Radja.** "Pollen wall patterns as a model for biological self-assembly" **JEZ-B Molecular and Developmental Evolution**, 2020. [[pdf](#)]

J Liu, **A. Radja**, Y Gao, R Yin, A Sweeney, S Yang. "Mimicry of biophysical pathway leads to diverse pollen-like surface patterns" **PNAS**, 2020. [[pdf](#)]

**A. Radja**, EM Horsley, MO Lavrentovich, AM Sweeney. "Pollen cell wall patterns form from modulated phases" **Cell**, 2019. [[pdf](#)]

MO Lavrentovich, EM Horsley, **A. Radja**, AM Sweeney, RD Kamien. "First-order patterning transitions on a sphere as a route to cell morphology" **PNAS**, 2016. [[pdf](#)]

G Yang, AE Bolotnikov, PM Fochuk, O Kopach, J Franc, E Belas, KH Kim, GS Camara, A Hossain, Y Cui, AL Adans, **A. Radja**, R Pinder, RB James. "Post-growth thermal annealing study of CdZnTe for developing room-temperature X-ray and gamma-ray detectors" **Journal of Crystal Growth**, 2013.

K Roodenko, HM Nguyen, L Caillard, **A. Radja**, P Thissen, JM Gordon, YN Garstein, AV Malko, YJ Chabal. "Anisotropic optical properties of thin-film thiocarbocyanine dye aggregates" **Journal of Physical Chemistry C**, 2013.

## Research Appointments

**Harvard University**, Independent Fellow 2020-present. NSF-Simons Center for Mathematical Biology

**Harvard University, L. Mahadevan Lab.** Schmidt Science Fellow 2019-2020.

**University of Pennsylvania, Sweeney Lab**, 2013-2019. Dissertation "Surface patterns on single cells: a consequence of a phase transition to modulated phases"

**University of Texas at Dallas, Malko Lab**, 2010-2013. Fabricated organic/inorganic hybrid nanoscale devices for light harvesting applications

**Brookhaven National Laboratory, REU Intern**, Summer 2012. Characterized crystals used as radiation detection material  
**University of California Los Angeles, REU Intern**, Summer 2011. Characterized viscoelastic properties of bullfrog auditory membrane

## Teaching Appointments

**UPenn Center of Teaching and Learning, Teaching Assistant trainer**, Summer 2016-2017  
**Philly Tutoring, Private STEM tutor**. Tutored 11 middle-high school students, 2013-2017  
**UPenn, Laboratory Teaching Assistant**, 2013-2017. Physics I/II, Honors Physics  
**UPenn, Teaching Assistant**. Physical models of biological systems, Fall 2013. Mechanics, Heat and Sound Spring 2015, 2018  
**UTD, Teaching Assistant**. Mechanics and Electromagnetism, 2011-2012  
**UTD, Peer-Led Tutor**. Mechanics and Electromagnetism, 2009-2012

## Invited talks

**Princeton University Rising stars in Biological Engineering**, “Uncovering soft coral sea fan morphology”, November 2020  
**Broad Institute Models, Inference, and Algorithms Seminar Series**, November 2020  
**American Physical Society, March Meeting**, “Pollen cells form from modulated phases”, March 2020  
**Georgia Institute of Technology, Math-Bio Seminar**, “Pollen cells form from modulated phases”, January 2020

## Contributed Talks/Posters

**University of Pennsylvania, Biochemistry and Molecular Biophysics Colloquium**, “Patterns on pollen: a polysaccharide phase transition process”, 2017  
**American Physical Society, March Meeting**, “Patterns on pollen: a polysaccharide phase transition process”, 2017  
**Penn-KIST Joint Symposium**, Poster: “Patterns in deep time”, 2016  
**American Physical Society, March Meeting**, “Patterns for fluid managements: the origins of microarchitectures”, 2016  
**Shape Up Conference**, Poster: “Patterns for fluid managements: the origins of microarchitectures”, 2015  
**Geometry and Physics of Spatial Random Systems Conference**, Poster: “Patterns for fluid managements: the origins of microarchitectures”, 2015  
**American Physical Society, March Meeting**, “Ultrafast exciton energy transfer from giant nanocrystals to JA films”, 2012

## Outreach

**Cambridge Ringe and Latin School Volunteer**, Fall 2019-Spring 2020 [1-2hr/week STEM tutoring for high school students]  
**Women+ of Color Workshop Volunteer**, 2019 [Reviewed graduate school applications for underserved members of community – [program link](#)]  
**PennLENS (University of Pennsylvania Laboratory Experience in Natural Sciences) Mentor**, Summer 2015, 2016 [Mentored two high school students, 5hrs/week for summer in research lab setting – [program link](#)]  
**SPARK Mentor**, Spring 2015 [Mentored middle school student 2hrs/week for semester – [program link](#)]  
**Lecturer at Swarthmore Catalyst Conference**, 2015 [Taught students about structural color in nature during afternoon conference – [program link](#)]  
**NanoDay Facilitator**, 2015 [Group leader for high school students – [program link](#)]