

Shalini Kurinchi-Vendhan

aspiring astrophysicist, writer, & educator

† Heidelberg, Germany

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📄 skurinch.github.io/astrolit

Astrophysical simulations tell a story by allowing us to picture how the Universe and its galaxies came to be. Similarly, I always endeavor to create a narrative about my research that can reach a wide audience.

Education

2024 – 2025

Heidelberg University – Institute for Theoretical Astrophysics

Heidelberg,
Germany

Fulbright Scholar & Master of Science in Physics

Thesis: “Supermassive Black Hole Growth and Feedback in Idealized Simulations of Galaxies”

2019 – 2023

California Institute of Technology

Pasadena,
California

Bachelor of Science in Astrophysics

Cosmology · Stars · Interstellar Medium · High-Energy Astrophysics · Structure and Dynamics of Galaxies · Radiative Processes · Feedback Control Systems · Mathematical Chaos · Methods of Computational Mathematics · Mathematical Methods of Physics · Computational Physics

Bachelor of Science in English Literature

American Modernism · Novels of Education · Russian Literature · Poetry Writing · 19th Century British Literature · Premodern Literature · Writing in Astronomy · History of Books · Fiction Writing · Journalism & Storytelling · Metascience: The Science of Being an Impactful Scientist

2015 – 2019

Morris Hills High School | Magnet Program for Mathematics & Science

Rockaway,
New Jersey

Graduating Valedictorian

Took courses in research and data analysis and completed an independent research project.

Fellowships & Awards

international (*), national (†), and university-level (‡) recognition

- * *U.S. Fulbright Scholarship – Research/Study Award to Germany*
- † *National Science Foundation Graduate Research Fellowship*
- † *American Astronomical Society Chambliss Achievement Medal*
- ‡ *Margie Lauritsen Leighton Prize for Caltech Undergraduate Woman in Physics & Astronomy*
- ‡ *Paul Studenski Memorial Prize – Travel Award to Literary England*
- ‡ *Samuel N. Vodopia and Carol J. Hasson Fellowship for Summer Undergraduate Research*
- ‡ *Hallet Smith Prize in Literature for Outstanding Critical Essay*
- ‡ *Doris S. Perpall Speaking 2nd Place Award for Science Communication*

Scientific Publications

- 2024
Leading Author Shalini Kurinchi-Vendhan, Marion Farcy, Michaela Hirschmann, Francesco Valentino, **On the origin of star formation quenching in massive galaxies at $z \gtrsim 3$ in the cosmological simulations IllustrisTNG**, [Monthly Notices of the Royal Astronomical Society, Volume 534, Issue 4, November 2024, Pages 3974–3988](#), arXiv:2310.03083
- 2023
Collaborator Philip F. Hopkins, Alexander B. Gurvich, Xuejian Shen, Zachary Hafen, Michael Y. Grudić, Shalini Kurinchi-Vendhan, et al. **What causes the formation of discs and end of bursty star formation?**, [Monthly Notices of the Royal Astronomical Society, Volume 525, Issue 2, October 2023, Pages 2241–2286](#), arXiv:2301.08263

Research Experience

- 2023 – 2024
Heidelberg, Germany **Max Planck Institute for Astronomy**
Advised by Dr. Annalisa Pillepich
U.S. Fulbright Scholarship
Supermassive Black Holes and Dense Environments in IllustrisTNG Jellyfish Galaxies.
- 2019 – 2023
Pasadena, California **Caltech (TAPIR) Theoretical AstroPhysics Including Relativity and Cosmology**
Advised by Professor Philip F. Hopkins
The Evolution of Galaxies and Supermassive Black Holes in Cosmological Simulations.
- 2022 – 2023
Lausanne, Switzerland **École Polytechnique Fédérale de Lausanne**
Advised by Professor Michaela Hirschmann
The Origin of Star Formation Quenching in Early, Massive Galaxies with IllustrisTNG.
- Summer 2022
Cambridge, Massachusetts **Harvard & Smithsonian Center for Astrophysics**
Advised by Dr. Francesca Civano and Dr. Laura Brenneman
Samuel N. Vodopia & Carol J. Hasson Fellowship
Constraining Supermassive Black Hole Accretion with the *Chandra* X-Ray Telescope.
- Summer 2021
Pasadena, California **Carnegie Observatories – Theoretical Astrophysics Center**
Advised by Dr. Andrew Benson
Carnegie Astrophysics Summer Student Internship
3-D Numerical Simulations of Dark Matter with the Semi-Analytic Code *Galacticus*.
- Summer 2020
Copenhagen, Denmark **Niels Bohr Institute – Dark Cosmology Center**
Advised by Dr. Michaela Hirschmann
Caltech Summer Undergraduate Research Fellowship
AGN in Nearby Dwarf Galaxies with IllustrisTNG and Synthetic Emission Line Models.
- Summer 2018
Socorro, New Mexico **Summer Science Program in Astrophysics**
Advised by Professor Adam Rengstorf and Professor William Andersen
Competitive High School Summer Program
Predicted the orbit of a near-Earth asteroid with a research-grade telescope.

Teaching

- 2023**
Pasadena, California
Physics Teaching Assistant
Waves, Quantum Physics, and Statistical Mechanics (100+ Students)
Lead office hours and marked problem sets for a core curriculum physics class.
- 2020 – 2023**
Pasadena, California
Hixon Writing Center
Peer Tutor in Academic Writing
Lead small group workshops and one-to-one meetings with students to help improve their writing across humanities and STEM disciplines.
- 2020 – 2023**
Pasadena, California
Reading Partners of Los Angeles
Matilda Wormwood Teaching Award
Taught literacy skills to elementary school kids who were behind grade-level in reading.

Science Writing

- Personal Website*
astropoetry Blog *(New!)*
Concept for a [web-magazine](#) about the connections between science, art and poetry.
- Magazine Article*
How Do the Tails of Jellyfish Galaxies Form? Blog Post
Collaborated on a [science education article](#) for a physical sciences STRUCTURES magazine.
- Classroom Resources*
Science in School Volunteer Editor
Collaborated with science teachers to write classroom articles about topics in astronomy.
- Multimedia Outreach*
Reach-the-World Science Travel Diaries
Shared my experiences as an astronomer traveling in Europe with a 3rd grade special-education classroom in New York City through writing articles for a [blog](#).
- Journal Article*
Peer-Reviewed Publication in Caltech Undergraduate Research Journal
Communicated my dark matter research in an [accessible article](#) to reach a broad audience.

Communication & Outreach

- Public Lectures*
Astronomy at the German-American Institute in Heidelberg
Gave lectures about introductory astronomy for pre-school and higher-level kids. Organized a weekly [“Out of This World!” children’s library storytime](#) program.
- Cultural Immersion*
Meet US Teach & Travel, Frankfurt
Lead classroom discussions about culture and education at a vocational school for women.
- Museum Exhibitions*
Theater Production at the Festival of Wonder in Italy
Co-wrote a play about “The Feminist Birth of Climate Science,” in collaboration with the University of Trento. Performed for the public at the Museo delle Scienze in Italy.
- Art & Science Fusion*
Storytelling for Scientists
Performed [narratives about my passion for science](#) with the Los Angeles community.

Presentations & Talks

- 2024
Pisa, Italy
The Physical Processes Shaping the Stellar and Gaseous Histories of Galaxies *Poster Presentation + Flash Talk*
Quenching and AGN Activity in IllustrisTNG at High Redshifts and in Dense Environments
- 2023
Seattle, Washington
241st American Astronomical Society Meeting
Chambliss Prize-Winning Poster
The Role of Black Hole Feedback in Quenching Simulated Dwarf Galaxies
- 2022
Malibu, California
Southern California Conference in Undergraduate Research
Invited Talk
Connecting Galaxy Evolution to Black Hole Spin with the *Chandra* X-Ray Telescope
- 2021
Pasadena, California
240th American Astronomical Society Meeting
Poster Session
The Spherical Collapse of Fuzzy Dark Matter in 3-D Simulations
- 2020 – 2022
Pasadena, California
Caltech Summer Undergraduate Research Fellowship Seminar Day
Doris S. Perpall Prize-Winning Talks
The Spherical Collapse of Fuzzy Dark Matter in 3-D Simulations
Connecting Galaxy Evolution to Black Hole Spin with the *Chandra* X-Ray Telescope
Black Holes and the Death of Galaxies: An Exploration with Simulations