# Aarathi Parameswaran

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## *Education*

**University of Bonn** October 2022 – present
*Master of Science in Physics* *Bonn, Germany*

- Relevant Coursework: Advanced Quantum Theory, Particle Physics, Statistical Methods of Data Analysis, Complex Networks and Energy Grids, Quantum Computing, Quantum Technology, Quantum Optics, Advanced Atomic Molecular and Optical Physics, Theoretical Neuroscience, Weather and Climate for Physicists, Energy Production.

**Azim Premji University** July 2019 – May 2022
*Bachelor of Science (honours) in Physics* *Bangalore, India*

- Grade: 8.71/10
- Minor: Media and Democracy
- Relevant Coursework: Mechanics, Quantum Mechanics, Mathematics for Physics, Nonlinear Dynamics, Solid State Physics, Waves Phenomena, Optics, Electricity and Magnetism, Thermal Physics, Computing in Physics, Spectroscopy, Wildlife and Ecosystems, Media and Politics in India, Media Communications, Public Reasoning, Political Philosophy, Writing for the Media, Academic Writing, Multimedia Storytelling.

## *Relevant Experience*

**Master Thesis** May 2024 – present
*Institute for Theoretical Physics, University of Cologne* *Cologne, Germany*

- Topic: Structural Transitions in Optimal Networks
- Supervisor: Prof. Dirk Witthaut
- Group: Network Science Group, University of Cologne and Networks; Energy Networks and Complex Systems Group, Institute of Climate and Energy Systems (ICE-1), Forschungszentrum Jülich

**Participant** June 2024
*Complexity72h Workshop* *Madrid, Spain*

- Participated in the week-long Complexity72h workshop, which involved attending various talks across different fields in complex systems and completing a project resulting in a paper pre-print within a span of 72 hours. The project was on optimal transport networks.
- Project topic: Assessing Metro Networks Efficiency using Max-Plus Algebra
- Supervisor: Dr. Ebrahim Patel, University of Greenwich

**Visiting Student** February 2024 - March 2024
*Abdus Salam International Center for Theoretical Physics* *Trieste, Italy*

- Attended the Spring College in the Physics of Complex Systems as a fully funded student, in collaboration with ICTP and SISSA.
- Courses and Supervisors: Statistical Mechanics of Random Matrices, Prof. Isaac Perez Castillo; Thermodynamics of Information, Prof. J M R Parrondo; Collective Dynamics in Complex Systems, Prof. Ram Ramaswamy; The Physics of RNA, Dr. Anže Božič
- Average grade: 17.6/20

**Graduate Assistant** December 2023 - March 2024
*Institute for Applied Physics, University of Bonn* *Bonn, Germany*

- Worked as a graduate assistant for the Nonlinear Quantum Optics group.
- Tasks involved designing and testing experiments on quantum optics for bachelor and master students.
- Supervisor: Prof. Sebastian Hofferberth

**Bachelor Thesis** February 2021 - May 2022

*Azim Premji University* *Bangalore, India*

- Topic: Investigating Taylor-Couette Flow
- Supervisor: Dr. Kaustubh Manchanda
- Grade: O
- Independent research project on studying the nonlinear fluid dynamics phenomena of Taylor-Couette flow, computationally and experimentally by building a Taylor-Couette reactor and using Computational Fluid Dynamics.

## *Additional Experience*

**Visiting Student** May 2022 - June 2022

*Inter-University Center for Astronomy and Astrophysics* *Pune, India*

- Attended the Introductory Summer School on Astronomy and Astrophysics, with a series of lectures, courses and talks on astrophysics.

**Participant** May 2022

*International Center for Theoretical Sciences* *Bangalore, India*

- Participated in the course and workshop on Gravitational Waves Data Analysis held by ICTS on data analysis tools used by the LIGO-Virgo-KAGRA Collaboration to detect and analyze the gravitational wave signals from compact binary mergers.

**Mediator** February 2021 - June 2021

*Science Gallery Bengaluru* *Bangalore, India*

- Worked as a mediator for Science Gallery Bengaluru's digital exhibition titled CONTAGION, an exhibition that explored the phenomenon of the transmission of emotions, behaviours, and diseases. Involved science communication through the interdisciplinary lens of science and art to visitors of the exhibition.

**Intern** December 2021

*AlphaZee Systems* *Kochi, India*

- Worked as an intern for AlphaZee Systems, a solar energy systems company. Accompanied on-site projects and helped set up PVs and other renewable sources of solar energy.

## *Awards & Honors*

**Scholarship (Declined)** Stuttgart, Germany

*International Max Planck Research School for Condensed Matter Science* *June 2022*

**Invited Speaker** Bangalore, India

*Infosys Science Foundation* *July 2022*

## *Specialized Skills*

**Programming Languages:** Python, Wolfram Mathematica, MATLAB

**Python Libraries:** Qiskit, NetworkX, NumPy, SciPy, pandas

**Typesetting:** LaTeX

**Simulation/Modeling Tools:** OpenFOAM, ANSYS Fluent, Autodesk Fusion 360, Autodesk CFD, FEBio Studio

**Other Software:** Softology, OSLO Edu, Tracker, NAAP Labs, SAOimageDS9, Stellarium, FL Studio

*Additional Achievements and Interests*

- Student Council: Bonn-Cologne Graduate School of Physics and Astronomy (2023).
- Student Council: Azim Premji University (2019-2021), Arts and Culture Committee, Sports and Fitness Committee.
- Student Council: Literary Secretary of Chinmaya Vidyalaya Vaduthala (2018).
- Selected to the Under-19 Kerala State Football team (2017).
- Gold medallist at National level athletics meet for 800m and 400m (2015)
- Represented school and college at the district, state and national levels for football, athletics, basketball and volleyball.
- Shorin-ryu Seibukan Karate Brown 3 belt.

*Other Interests*

Music (trained multi-instrumentalist), Philosophy of Science and Physics, Reading, Etymology and Applied Linguistics, Art History, Political Philosophy, Photography.

*Language Proficiency*

English (Bilingual, Fluent, TOEFL iBT: 113/120), Malayalam (Native, Fluent), Hindi (Advanced), Tamil (Elementary), German (Elementary)