

Aditya Dwarkesh

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Education

2019-Present **Indian Institute of Science Education and Research, Kolkata, Department of Mathematics & Statistics,**
Five-year integrated BS-MS Course, major in mathematics & minor in physics.
Current CGPA: 8.7

Research work

Cohomology of graded Lie algebras.

Selected for the MITACS Globalink 2023 summer research internship to work under the supervision of Dr. Martin Frankland (University of Regina, Canada). Wrote code to compute the cohomology groups of graded Lie algebras, and made direct contributions to the SageMath software (with code found [here](#) and [here](#)).

Structure theory of Novikov algebras.

Completed a project under the supervision of Dr. Amartya Goswami (University of Johannesburg) which generalizes Jacobson's structure theory of rings to non-associative (Novikov) algebras. Pre-print can be found [here](#)

Geometric and Berezin quantization.

Currently working under the supervision of Dr. Rukmini Dey (International Centre for Theoretical Sciences, Bengaluru) on my masters' thesis on the topic of geometric and Berezin quantization.

Coursework

Some relevant coursework done as a graduate student.

- Algebraic topology (Fundamental group, covering space theory, homology, cohomology)
- Differential geometry (Tangent spaces, integration, differential forms, connections, curvature)
- Quantum field theory (Canonical formalism, path integral formalism, renormalization theory)
- Functional analysis
- Ordinary & partial differential equations
- Commutative algebra

Publications

Selected publications.

- Dwarkesh, Aditya (2022). *Wilderness & Civilization: A Phenomenological Perspective*. *Filosofie-Tijdschrift*, jr. 32, no. 2.
- Dwarkesh, Aditya & Voleti, Satbhav (2021). *Gödel's Incompleteness Theorems: An Interdisciplinary Review*. In: *Indian Science Cruiser*, Vol 35, No 4, og 34-50.
- Dwarkesh, Aditya et. al (2020), *A Highschooler's Guide to GeV-Range Electromagnetism*, *The Physics Educator*, Vol. 02, No. 03.
- Dwarkesh, A. (2019). *'Fundamentality' as a Linguistic Paradigm and Linguistics as a Fundamental Paradigm*. In: Aguirre, A., Foster, B., Merali, Z. (eds) *What is Fundamental?*. The Frontiers Collection. Springer, Cham.

Awards

May 2018- **Beamline for Schools, European Council for Nuclear Research (CERN).**

- December 2018
- Beamline for Schools (BL4S) is a competition in which CERN, the European Organization for Nuclear Research, in Geneva, which invites teams of high-school students to propose a scientific experiment to be performed there.
 - Secured a top spot and executed our experiment at the T9 beamline of Proton Synchrotron, where we attempted to heuristically reconstruct the Lorentz force equation based on the data gathered from our runs.

December 2018 **Department of Atomic Energy, Government of India.**

- Felicitated by Chairman of Bhabha Atomic Research Centre, K.N. Vyas.
- Awarded for extraordinary contribution in representing India at European Council of Physics (CERN) BL4S.

August 2017- **Foundational Questions Institute, (FQXi).**

- December 2017 ○ Participated and won a prize in FQXi's 2017 essay contest on the topic of 'What is Fundamental?'
- 2017 ○ Subsequently, the essay was published by Springer as part of a compendium of the winning essays in its 'Frontiers of Science' collection. Link to the [essay](#) and the [book](#).

December 2016 **Indian Philosophy Olympiad.**

- Secured national rank 5 in the 2016 Indian Philosophy Olympiad

October 2016 **International English Olympiad, SOF.**

- Secured international rank 17 in the 6th International English Olympiad

In my **Others.**

- younger days ○ Part of the winning relay race team in grade 9 and grade 10 in my school's annual Sport Day, secured 3rd and 2nd prize in the 100m sprint for each respective year
- Completed Trinity Grade 1 in theory of music with distinction at the age of 8, and completed grade 2 in theory with merit the next year
- Completed Group 2 of the "Sri Sathya Sai Education Programme" (said to reflect a student's exemplary moral values)
- Won many certificates and medals in various local chess and gymnastics tournaments

Co-curricular Activities

Teaching experience.

- Teaching assistant for the 'Mathematical Methods II' course in Autumn 2023

April 2022 - **The Mohanpur Circle.**

- Ongoing ○ Co-founded a philosophy discussion group which specializes in phenomenology
- Organised various public screenings and weekly discussions in order to generate interest and engagement in these areas

December 2021 **PhilSci India Winter School.**

- 2021 ○ Participated as a student in a 5-day winter school program
- Attended talks given by various researchers on topics in the philosophy of science
- Gave a presentation on the last day based on one of the talks attended

June 2021 - **Institute of Philosophy, Zagreb, "In & Out—Questioning the Philosophical Canon".**

- July 2021 ○ Participated as a student and engaged with graduate students and esteemed lecturers in a [summer school](#) which focused on the origin and shortcomings of present-day philosophy's "canon"

2020 **Reading Project.**

- Read texts on model theory, first-order logic and automata theory under the supervision of Dr. Mihir Chakraborty

August 2019 **RAD@home, Astronomy Collaboratory, India.**

- Was selected to participate in a one day long training session intended to enable young undergraduate students to engage in astronomical observational research at a professional level
- Learned to make multi-wavelength astronomical images by accessing freely available archival data on NASA Skyview

Outreach

April 2022 **Department Day, Poster Presentation.**

- In collaboration with a friend, designed and presented a poster which explains Gödel's incompleteness theorems to the layman.

July **Cogito - The Thought Capsule, Student-run magazine.**

- 2020-Current year ○ Editor of Cogito, a web-based bi-monthly
- The magazine aims to encourage rational thinking, scientific awareness and communicate general science amongst the public, while also entertaining slightly technical articles for those who may be so inclined
- Also contributes for the same as an author on certain occasions
- Link to [website](#)

March 2017- **The Eyries and Pyres of Thought, TED Organization.**

- March 2019 ○ Started a newsletter in collaboration with the TED organization in order to explain advanced topics in a simple manner for students all over the world.
- The newsletter covered topics like Analytic Philosophy, Cognitive Science, Relativity, Quantum mechanics
- Contributed articles for each issue on the topic of Analytic Philosophy.
- Link to [newsletters](#)

March 2019 **National Training Program, Raising a Mathematician (RAMTP).**

The purpose of the organization is to search and mentor young mathematical talent throughout India.

- Delivered invited lectures to the students for a day on an introduction to particle physics
- Introduced them to the field and entertained the eager queries of their curious minds
- Helped demonstrate elementary but visually striking physics experiments such as Young's double slit, cloud chamber in order to inculcate interest

Extracurricular Activities

2023.

- Wrote a short story published by PS Publishing in the eminent literary critic S.T. Joshi's upcoming anthology, *Black Wings VII*.

2022.

- Gold medalist for a literary club event at IICM 2022, the inter-IISER cultural meet
- Event organiser in LEXIS 2.0, IISER Kolkata's official literary fest

2021.

- Office bearer of IISER Kolkata's literary club

2019.

- Declared brand ambassador of my high school at the farewell post 12th grade as acknowledgement of my contribution as a student and peer back to the school
- Lead scriptwriter for the annual school event 'Drishtikon' in grade 9, grade 10 and grade 11

2017.

- Was selected as a visiting student at TIFR Mumbai as part of the 'Frontiers of Science' program
- Designed and made a robot which detected and minimized water wastage in household fixings along with two teammates as part of the Technology Robot Artificial Intelligence (TRAI) Summit organised by Consilience

Community Service

August 2019 **Ek Pehal-IISER Kolkata.**

- Participated in a clothes distribution drive and helped an ongoing library setup in order to uplift the underprivileged
- Helped in cataloguing and segregated the books and doing the same for and distributing the clothes
- Devoted about ten hours a week for two weeks as well as one full day for the clothes distribution

2017 **Vanshakti.**

- Participation in a mangrove tree-planting project by NGO Vanshakti in Bhandup, Mumbai
- Directly participated in the afforestation efforts and tree-planting for two full days

2017 **Red Cross.**

- Participated in a Red Cross first-aid training camp in the year 2017
- Received hands-on experience in administering first-aid such as CPR

References

Somnath Basu, *Associate Professor*,

Department of Mathematics and Statistics, Indian Institute of Science Education and Research, Kolkata, somnath.basu@iiserkol.ac.in.

Martin Frankland, *Associate Professor*,

Department of Mathematics and Statistics, University of Regina, Canada, Martin.Frankland@uregina.ca.

Mihir Chakraborty, *Visiting Professor*,

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