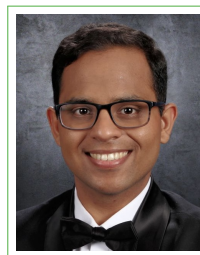# Gaurav Goel

Preferred Name: Dhruv

Pronouns: he/they

10 Holyoke Place, 170 Lowell Mail Center
Cambridge, Massachusetts 02138
📞 +1 (617) 909-9557
✉ gauravgoel@college.harvard.edu
🖰 goggles2001.github.io

Education

2024 **(Expected) A.B.**, *Harvard University*, **Cambridge, MA.**
Anticipated double concentration in Mathematics and Germanic Studies with a secondary in Music.

2019 *Pace Junior Science College Andheri (PJSC)*, **Mumbai, India.**
Highest score out of over 550,000 candidates in the Maharashtra HSC Examinations in Science 2019.

2017 *Thakur Public School (TPS)*, **Mumbai, India.**
Valedictorian.

Research, Publications, and Expository Writing

[1] On Powerful Integers Expressible as Sums of Two Coprime Fourth Powers (with Noam D. Elkies).
Res. Number Theory **9**, 78 (2023) (proceedings of ANTS-XV, 2022). doi: 10.1007/s40993-022-00415-9

[2] The Chow Ring Classes of PGL_3-Orbit Closures in $\mathbb{G}(1,5)$. 2022. [arXiv Preprint]
The following articles are in preparation.

[3] Chow Classes of the Varieties of Secant and Tangent Lines to a Projective Variety. Advisor: Hannah Larson.

[4] The Atiyah-Singer-Hirzebruch-Riemann-Roch Theorem. Senior thesis. Advisors: Joe Harris and Dan Freed.
Several other expository articles are available on my webpage.

Academic Honors, Awards, and Research Funding

2023 **Phi Beta Kappa (PBK), Senior 48**, national academic honor society. See this article.

2023, '22, '20 **John Harvard Scholarship, Harvard University**, honorary scholarship for students in the class top 5%.

2022 **Joint Fellow, Herchel-Smith Undergraduate Science Research Program**, and
Program for Research in Science and Engineering (PRISE). $4500, research funding for [2].
Conducted original research as part of the Harvard Summer Undergraduate Research Village (HSURV).

2020 **Harvard College Research Program**. $2700, research funding for [1].
Conducted remote supervised research in number theory.

2019, 2018 **Merit Award, Indian National Mathematics Olympiad (INMO)**
Awarded by the National Board for Higher Mathematics (NBHM) of India to the top 60 scorers.

2017 **Thakur Ramnarayan Memorial Award, TPS**

Positions

Harvard Undegraduate Gender Inclusivity in Mathematics (HUGIIM)

2022-23 **Co-president**: Organized projects and socials, collaborated with other inclusivity organizations.

2021-22 **Mentorships Co-Chair**: Co-organized the *Math Includes* mentorship program.

2021-22 **Manager, Harvard Glee Club Lite**: managed the a cappella subset of the Harvard Glee Club.

Teaching and Mentorship

Course Assistant, Department of Mathematics, Harvard University
Led discussion and review sessions, held office hours, graded homework, and prepared solutions.

Spring 2024	**Math 222: Lie Groups and Lie Algebras**, taught by Noam D. Elkies (scheduled)
Fall 2023	**Math 213A: Advanced Complex Analysis**, taught by Curt McMullen; see the course webpage.
Spring 2023	**Math 129: Number Fields**, taught by Salim Tayou
Fall 2022	**Math 114: Analysis of Function Spaces, Measure and Integration**, taught by H. T. Yau
Spring 2022	**Math 132: Differential Topology**, taught by Dennis Gaitsgory
Fall 2021	**Math 55A: Honors Group Theory and Abstract Algebra**, taught by Denis Auroux

In addition, served as a volunteer course assistant for the following.

Spring 2021	**Math 132**, taught by Joe Harris
Spring 2021	**Math 55B: Honors Real and Complex Analysis**, taught by Denis Auroux
Fall 2021	**Math 55A**, taught by Denis Auroux
Summer 2021	**Counselor, Ross Mathematics Program USA**
	Led discussion sessions for a group of high school students for a course on number theory.
Summer 2021	**Course Assistant: Rational Points on Curves, Advanced Course at Ross USA**
	Led discussion sessions for this course aimed at counselors taught by Stefan Patrikis.
Summer 2020	**Course Head, Math 57, Math Online Summer Program (MOSP)**
	Taught group theory to high school students as part of a program organized by Alec Sun.
2019	**Teaching Assistant, Math Olympiad Program, PJSC**
	Taught students in grades 8 through 12 advanced math in preparation for the IMO.

Talks

Nov 2022	**Emmy Noether: Mathematician Extraordinaire**, Harvard-MIT Math Tournament (HMMT), Education Session
Feb 2022	**The Three-Sphere in Dante's *Divine Comedy***, HMMT Education Session
Nov 2021	**The Inverse [Quadratic] Central Potential and the Cubic Equation** Harvard Society of Physics Students (SPS), Undergraduate Chalk Talks Series
Aug 2021	**Galois Cohomology and Hilbert's Theorem 90**, Ross 2021, Dorm Lecture for *Rational Points on Curves*
Nov 2020	**What Is Algebraic Geometry and Why Do We Care?**, HMMT Education Session
Oct 2019	**Fermat's Little Theorem and its Applications to Cryptography**, Harvard University Math Table

Arts

2022 -	**Member, Harvard University Choir**, and Ferris Choral Fellow 23-24.
Feb 2022	***Bard, If A Picture Never Lies,* Harvard Classics Club** Baritone in the premier of Sage's *If A Picture Never Lies*. See this article in the Harvard Crimson.
2021 - 2023	**Member, Harvard Choruses New Music Initiative**
2019 - 2023	**Fellow, Holden Voice Program**
2019 -	**Member, Harvard Glee Club**

Other

Software:	Python, Java, SageMath, Pari/GP, Microsoft Office Suite
Languages:	English (first language), Hindi (first language), German (third year of college instruction)