

Education	École Polytechnique Fédérale de Lausanne, Switzerland	Sept 2017 - Present
	Masters of Science in Mathematics Expected graduation: Feb 2019 <i>Average grade (ongoing): 5.25/6.0</i>	
	Indian Institute of Technology, Kanpur, India	July 2013 - May 2017
	Bachelor of Science (Hons.) in Mathematics and Scientific Computing <i>Cumulative Performance Index (CPI), during graduation: 9.0/10.0</i>	
Research Interests (keywords)	Number theory, geometry, polylogarithms, combinatorics, coding theory, experimental mathematics, finite fields, zeta functions, algebraic combinatorics, symmetric group, representation theory, iterated integrals, Hopf algebra.	
Scholastic Achievement	<ul style="list-style-type: none"> • Qualified and secured an All India Rank of 871 out of over 123 thousand candidates in the second round, in Joint Engineering Exam (Advanced), a two-phase exam where over 1.26 million candidates appeared. • Selected for Charpak Research Internship Program 2016, a French scientific initiative. • Recipient of INSPIRE scholarship, granted by the Department of Science and Technology, India. • Received Academic Excellence award, 2017 at IIT Kanpur. • Recipient of the J.N.Tata Scholarship for Higher Education. • Received that Charles Rapin Grant, a scholarship for Masters studies at EPFL. 	
Background and Skills	Programming I have experience in Python, C, C++, openCV, OpenGL, sage and R. I create OpenGL-based math visuals for my blog (some for wikipedia as well). Here is my github .	Mathematics I have done a wide breadth of coursework in my 5 years of college education. This includes, geometry, number theory, algebra. A list of my full coursework is here . I maintain this blog .
Masters Thesis	Algebraic coding theory <i>Supervised by Maryna Viazovska, EPFL</i>	Fall, 2018
	<ul style="list-style-type: none"> • This is an ongoing project that involves the study of various asymptotic bounds in coding theory. Part of the project so far involved running tests on institute's computer clusters to get empirical data to investigate cyclic codes. 	
Masters Project	Arithmetic Hyperbolic 3-Manifolds <i>Supervised by Maryna Viazovska, EPFL</i>	Fall, 2017
	<ul style="list-style-type: none"> • This project consisted of reading the book <i>The Arithmetic of Hyperbolic 3-Manifolds</i> (Maclachlan, Reid) to get a background about quotients of Adèle groups and harmonic analysis on Adèles and Idèles. • I read Don Zagier's 1987 paper titled <i>Hyperbolic manifolds and special values of Dedekind zeta-functions</i>, about values of the Dedekind zeta function expressed in volumes of arithmetic hyperbolic 3-manifolds. Details are in this expository report. 	
Bachelor Projects	Polylogarithms and Combinatorics on Words <i>Supervised by Prof. Gérard H E Duchamp, Prof. H N Minh Laboratoire d'Informatique de Paris-Nord, Université Paris-Nord</i>	Summer, 2016
	<ul style="list-style-type: none"> • This project continued the existing line of work of Prof. Duchamp and Prof. Minh that concerned with understanding polylogarithms with the aid of tools from combinatorics of words. This is still an ongoing project and more details can be given on request. 	
	Classical Invariant Theory <i>Supervised by Prof. Preena Samuel, IITK</i>	Sixth Semester, 2016
	<ul style="list-style-type: none"> • Documented and read <i>Classical Invariant Theory</i> (Kraft, Procesi), building towards algebraic groups. • Wedderburn Theory and the Double Centralizer Theorem was covered. • Understood the Schur-Weyl Duality and in the context of the Representation Theory of $GL(n, \mathbb{C})$. 	
	Algebraic Geometry <i>Supervised by Prof. Sudarshan Gurjar, IIT Bombay</i>	Winter, 2015
	<ul style="list-style-type: none"> • Covered the book <i>Algebraic Curves</i> (William Fulton). • Received fundamental knowledge of algebraic geometry including Riemann-Roch theorem, sheaves and Noether-normalization theorem. 	
	Representation theory and Algebraic Combinatorics <i>Supervised by Prof. B. Sury, ISI, Bangalore and later by Prof. A K Lal, IITK</i>	May-December, 2015
	<ul style="list-style-type: none"> • Read <i>Enumerative Combinatorics, Vol 2</i> (Richard Stanley), <i>Young Tableaux</i> (William Fulton) to understand the Representation Theory of S_n. Details are documented. • Studied and applied Polya Theory to count the number of hexaflexagon structures, and derive the series A000207 from A000108. Details are in this report. 	

- Read *Enumerative Combinatorics, Vol 2* (Richard Stanley), *Young Tableaux* (William Fulton).
- Understood the Representation Theory of S_n and the connection with Schur polynomials and Young Tableaux. Details are [documented](#).

KNOT (a 3D visualization tool for Mathematical Knots) Summer, 2014

Guided by Prof. [Aparna Dar](#), IITK

- [Implemented](#) Knot Theory on OpenGL to compute invariants like Dowker-Thistlethwaite codes, crossing numbers, writhe, Fox-N-Colorability of any knot using concepts in Computational Geometry like the Bentley-Ottmann sweep line algorithm.

ISAAC (a 2D OpenGL-based physics simulation engine) First semester, 2013

Course project under Prof. [Subhajit Roy](#), IITK

- [Worked](#) upon an interface where user-drawn 2D solids could collide and interact. The physics algorithm was [designed](#) from scratch. I achieved a distinction in the course.

Conference attended **Combinatorics and Arithmetic for Physics: special days** Oct, 2018
Organised by Prof. [G H E Duchamp](#), Prof. [Maxim Kontsevich](#), Prof. [Gleb Koshevoy](#), Prof. [H N Minh](#) at Institut des Hautes Études Scientifiques

Workshops attended **Differential Geometry** July, 2017
Organised by Prof. [Mahan Maharaj](#), Prof. [Indranil Biswas](#), Prof. [Tejas Kalelkar](#) at Indian Institute of Science Education and Research, Pune

J-holomorphic curves and Gromov Witten invariants July, 2017
Organised by Prof. [Ritwik Mukherjee](#), Prof. [Somnath Basu](#) at National Institute of Science Education and Research, Bhubhaneswar

Representation Theory of Finite Groups June, 2017
Organised by Prof. [K V Subramanian](#), Prof. [Amritanshu Prasad](#) and Prof. [K. Raghavan](#) at Chennai Mathematical Institute, Chennai

Probability and Representation Theory March, 2016
Organised by Prof. [Arvind Ayyer](#), Prof. [Amritanshu Prasad](#) and Prof. [K. Raghavan](#) at Institute of Mathematical Sciences, Chennai

Positions of Responsibility **Masters**

- Teaching assistant of “Advanced Linear Algebra for Physics - 2” 2017-18
- Teaching assistant for “Advanced Linear Algebra for Physics - 1” 2018-19

Bachelors

- Interest group leader, CoNTRA (Combinatorics, Number Theory, Representation, Algebra) 2016-2017
- Hobby Group Leader, Science Coffeehouse (a science discussion group) 2015-2016
- Coordinator, Card and Board Games Club 2015-2016
- Coordinator, English Literature Society 2015-2016
- Academic Mentor for Mathematics, Counseling Service 2014-2015

Others I like to learn musical instruments. I have won a state-level dancing competition at the age of 11. I really like board games.
 I also contribute to Wikipedia in my freetime.