Curriculum Vitae

Pallav Goyal

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Education/Employment

2023 –		Visiting Assistant Professor, University of California, Riverside
2023	Ph.D.	University of Chicago, Mathematics (Advisor: Victor Ginzburg) Thesis - Almost commuting scheme of symplectic matrices and quantum Hamiltonian reduction Commitee members - Victor Ginzburg, Alexander Beilinson
2019	M.S.	University of Chicago
2017	B.S.	Indian Institute of Technology Kanpur

Research interests

Representation Theory, Symplectic Geometry, Algebraic Geometry, Combinatorics,

Academic honors and awards

2017 – 2019	McCormick Fellowship, University of Chicago (2 years, $6,000)
2017	Fellow, Visiting Scholars Resarch Program, Tata Institute of Fundamental Research, Mumbai
2017	Director's Gold Medal, Indian Institute of Technology Kanpur
2017	General Proficiency Medal, Indian Institute of Technology Kanpur
2016	Fellow, S.N. Bose Scholars Program, Science and Engineering Research Board, Government of India
2015	J N Kapur Prize, Indian Instituite of Technology Kanpur
2014 – 2016	Academic Excellence Award, Indian Institute of Technology Kanpur
2013	Bronze medal, 54th International Mathematical Olympiad, Santa Marta, Colombia
2012	Scholar, Kishore Vaigyanik Protsayan Yojana, Department of Science and Technology, Government of India (5 years, ₹300,000)
2009	Scholar, National Talent Search Examination, National Council of Education, Research and Training (4 years, ₹24,000)

Publications

4. (In preparation) *Chevalley Restriction Theorem in Type C and Cherednik algebras over algebraic curves*
3. *Almost commuting scheme of symplectic matrices and quantum Hamiltonian reduction*, To appear in Algebras and Representation Theory (2024), DOI 10.1007/s10468-024-10275-9
2. *Invariant Theory of finite general linear groups modulo Frobenius powers*, Communications in Algebra, **46** (2018), no. 10, 4511-4529
1. (with Santosha Pattanayak) *Projective Normality of G.I.T. quotient varieties modulo Finite Groups*, Communications in Algebra **45** (2016), no. 7, 2996-3004

Talks and presentations

2024 Jul.	IIT Kanpur Collouquium: Classical Mechanics and Hamiltonian reduction
—— May	University of Georgia (Representation Theory and Related Geometry: Progress and Prospects): Chevalley restriction theorem for algebraic curves
—— Apr.	UW Milwaukee (AMS Spring Sectional): Chevalley restriction theorem for algebraic curves
—— Apr.	Northwestern University (Gone Fishing): Chevalley restriction theorem for algebraic varieties and Cherednik algebras
2023 Nov.	UC Riverside Algebraic Geometry seminar: Mechanics and Hamiltonian reduction
—— Aug.	IIT Bombay Colloquium: Almost commuting variety and quantum Hamiltonian reduction
—— Aug.	TIFR Mumbai Colloquium: Almost commuting variety and quantum Hamiltonian reduction
—— Apr.	University of Notre Dame Algebraic Geometry and Commutative Algebra seminar: Almost commuting variety and quantum Hamiltonian reduction

2022 Sep. UChicago WOMP: Classical Mechanics and Hamiltonian reduction
—— Apr. UChicago Student Representation Theory Seminar: Generalizations of the Chevalley Restriction Theorem
—— Feb. UChicago Pizza seminar: Mathematics of Shoelacing
2021 Nov. UChicago Student Representation Theory Seminar: An introduction to rational Cherednik algebras
—— Feb. UChicago Student Algebraic Geometry Seminar: An introduction to fibred categories
2020 Oct. UChicago Student Representation Theory Seminar: Deformation theory of associative algebras and Hochschild cohomology
—— Mar. UChicago Student Representation Theory Seminar: Category $\mathcal{O}$ in positive characteristic
2019 Nov. UChicago Student Representation Theory Seminar: Borel-Weil-Bott theorem
—— Oct. UChicago Student Representation Theory Seminar: An introduction to Category $\mathcal{O}$
2018 Jun UChicago first Year seminar: Harishchandra isomorphism
2017 Jul. TIFR Mumbai VSRP presentations: The First Fundamental Theorem on invariants of actions of linear algebraic groups
—— Apr. IIT Kanpur Departmental seminar: Invariant Theory of General Linear Groups over Finite Fields
2015 Oct. IIT Kanpur Topology and Algebraic Geometry seminar: Diamond Lemma and its applications

Other achievements

2021 , 2024 Finalist, Indian Sudoku Championship
2013 - 2014 Finalist, International Collegiate Programming Contest, Amritapuri Regionals

Organizing activities

Conferences and other meetings

2024 Oct. Organizer (with Peter Samuelson and Boris Tsvelikhovskiy), Special session on Noncommutative Algebras in Representation Theory and Topology at the American Mathematical Society Fall western sectional meeting at UC Riverside, CA
2024 May Volunteer, Mathematical Pathways to an Excellent Future at UC Riverside, CA

Graduate seminars and other activities

2020 Fall Organizer (with Ignacio Darago), UChicago Student Representation Theory Seminar on Deformation Theory and Deligne's Conjecture
2020 Wint. Organizer (with Ignacio Darago), UChicago Student Representation Theory Seminar on Perverse Sheaves and Kazhdan-Lusztig Conjectures
2019 Fall Organizer (with Ignacio Darago), UChicago Student Representation Theory Seminar on $\mathcal{D}$-modules and Beilinson-Bernstein Localization
2019 Sep. Organizer (with Hao Lee), WOMP UChicago , Warmup and Orientation Program for incoming math graduate students

Referee and review activities

- *Transformation Groups* referee
- *zbMATH Open* reviewer
- *Math Reviews* reviewer

Other community outreach

2017 – 2019 Lecturer at Knowledge Center for Success (KCS) Bhilai: Gave lectures on several topics including Recurrence relations, Ceva's theorem and Pigeonhole principle geared towards training high school students for mathematical olympiads
2014 – 2017 Academic mentor, Academics Core team member and Coordinator at Counselling Service IIT Kanpur: Helped organize and gave lectures as well as provided one-to-one mentoring to students facing difficulties in mathematics classes at IIT Kanpur

2013 Volunteer at Help Student India Bhilai: Gave mathematics lectures to students from economically weaker sections of the society and trained them for competetive exams

Teaching activities

Personal development

2023 Winter College Teaching Certificate: Program offered by Chicago Center for Teaching to help instructors reflect on their pedagogical style and to learn and implement better teaching practices through seminars, workshops and feedback from professionals

2022 Fall Academic and Professional Writing (LRS): Course offered by the Writing Program (UChicago) on tools for making academic research and technical writing more lucid and effective for readers

2022 Spring Workshop on Inclusive Teaching, Chicago Center for Teaching

2022 Winter Seminar and Workshop on Teaching statement and Portfolio, Chicago Center for Teaching

2021 Fall Fundamentals of Teaching in Science: Workshop series offered by Chicago Center for Teaching focused on teaching methodologies for teaching college courses in STEM fields

2020 Spring College Teaching and Course Design: Course offered by Chicago Center for Teaching on student-centered pedagogical strategies for designing and implementing an undergraduate course

Courses taught at UC Riverside

2024 Fall Introduction to Discrete Structures (Math 11)

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2024 Spring First-year Calculus (Math 9A)

2024 Spring Calculus for Life Sciences II (Math 7B)

2024 Winter Calculus for Life Sciences I (Math 7A)

2024 Winter Polynomials and Number Systems (Math 140)

2023 Fall First-year Calculus (Math 9A)

2023 Fall Calculus: Several variables (Math 10B)

Courses taught at UChicago

2022 Fall Calculus II (Math 15200)

2022 Winter Studies in Mathematics II (Math 11300)

2021 Fall Mathematical Methods for Social Sciences (Math 19520)

2021 Spring Calculus III (Math 15300)

2021 Winter Linear Algebra (Math 19620)

2020 Fall Linear Algebra (Math 19620)

2020 Spring Elementary Functions and Calculus III (Math 13300)

2020 Winter Elementary Functions and Calculus II (Math 13200)

2019 Fall Elementary Functions and Calculus I (Math 13100)

Recitations led at UChicago

2019 Spring Analysis in $\mathbb{R}^n$ (Math 20300)

2019 Winter Abstract Linear Algebra (Math 20250)

2018 Fall Representation theory of finite groups (Math 26700)

Courses graded for at UChicago

2020 Spring Algebra III (Math 32700)

2019 Fall Calculus III (Math 15300)

Mentoring activities

Undergraduate students advised (while at UChicago)

2023 Spring Charles Benello: Polynomial time algorithm for primality testing

2023 Winter William Hu: Representation theory of finite groups

2022	Fall	Jakob Wellington: Elliptic curves cryptography
2022	Summer	Alex Sheng: Elliptic curves with complex multiplication
2022	Spring	Andrey Shapiro: Spectral graph theory
2022	Winter	Alex Sheng: Invariant theory of finite groups
2021	Fall	Drew Melman-Rogers: Adjoint functor theorem
2021	Summer	Ben Goldman: An overview of Lie Theory and Peter-Weyl Theorem
2021	Summer	Henry Hale: Representations of quivers and Gabriel's theorem
2021	Summer	John Naughton: Schubert calculus and enumerative geometry
2021	Spring	Judson Kuhrman: Representation theory of compact Lie groups
2021	Winter	Yuchen Chen: Linear algebraic groups
2020	Fall	Ruochuan Xu: An introduction to knot theory
2020	Summer	Sayali Gove: Probabilistic methods in combinatorics
2020	Summer	Anushka Murthy: Introduction to matroids
2020	Summer	Yueheng Zhang: Spectral graph theory
2020	Spring	Neil Mauskar: Fourier analysis
2020	Winter	Claudia Yao, Ajay Mitra: Representation theory of complex semisimple Lie algebras
2019	Fall	Thiviya Kumaran: Deep learning
2019	Spring	Elizabeth Ombrellaro: Group theory and ring theory
2019	Winter	Spencer Dembner: Dirichlet's class number formula for imaginary quadratic fields
2018	Fall	Roy McKenzie: An introduction to generating functions