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, Mathematics
2017	B.S.	Indian Institute of Technology Kanpur, Mathematics and Scientific Computing with a Minor in Algorithms

Research interests

Representation Theory, Combinatorics, Algebraic Geometry

Academic honors and awards

2025	Outstanding VAP Award, University of California Riverside
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	Infosys Award 2013, Infosys Foundation (1 year, ₹15,000)
2013	Bronze medal, 54th International Mathematical Olympiad, Santa Marta, Colombia
2012 – 2017	Scholar, Kishore Vaigyanik Protsayan Yojana, Department of Science and Technology, Government of India (5 years, ₹300,000)
2011 – 2012	Scholar, Indian National Mathematical Olympiad, Homi Bhabha Centre for Science Education
2010	Scholar, Regional Mathematical Olympiad (Chhattisgarh region), Homi Bhabha Centre for Science Education
2009 – 2013	Scholar, National Talent Search Examination, National Council of Education, Research and Training (4 years, ₹24,000)

Publications

6. (In preparation) *Cherednik algebras over curves with a $\mathbb{Z}/2$-action*
5. (with Daniele Rosso) (pre-print) *Representation theory of mirabolic quantum $\mathfrak{sl}_n$*, arXiv:math.RA/2510.07469
4. (with Peter Samuelson) (pre-print) *Hall algebra of restricted representations and Shifted quantum loop algebras*, arXiv:math.RT/2508.09405
3. *Almost commuting scheme of symplectic matrices and quantum Hamiltonian reduction*, Algebras and Representation Theory (2024), **27** (2024), 1645-1669
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

2025 Nov. ICMS, Edinburgh (New perspectives in quantum representation theory): Hall algebras and shifted quantum affine algebras
—— Oct. UC Riverside Representation theory seminar: Hall algebras and shifted quantum affine algebras
—— Aug. University of Denver (Special Session on Geometry, Integrability, Symmetry and Physics at AMS Fall Western Sectional): Hall algebras and shifted quantum affine algebras
—— Mar. UC Riverside Representation theory seminar: Bridgeland's theorem on the Hall algebra construction of the full quantum group
—— Mar. Washington University at St. Louis (Gone Fishing): Shifted quantum loop algebras and Hall algebras
—— Feb. UCLA Algebra seminar: Hall algebras of $\mathfrak{sl}_2$-modules over positive characteristic and shifted quantum loop algebras
2024 Oct. UC Riverside Representation theory seminar: Representations of $\mathfrak{sl}_2$ over positive characteristic and Hall algebras
—— Jul. IIT Kanpur Colloquium: 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 (Special session on Geometric Methods in Representation Theory at AMS Spring Central 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
—— May University of Chicago 3-minute thesis: Classical mechanics and almost commuting variety
—— 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
2016 Jun. UW Madison S.N. Bose Scholars presentations: 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 Non-commutative Algebras in Representation Theory and Topology at the AMS Western Sectional at UC Riverside, CA
2024	May	Volunteer, Mathematical Pathways to an Excellent Future at UC Riverside, CA

University service

2025		Member, Teaching Workshop Committee, UC Riverside
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: Delivered lectures to students from economically weaker sections of the society and trained them for competetive exams

Teaching activities

Personal development

2024 – 2025		Education seminar, UC Riverside: Weekly seminar for discussions on research on math education, on topics such as problem solving heuristics, quantitative reasoning, inquiry-based learning, socio-mathematical norms, writing proofs and proof comprehension.
2023	Winter	College Teaching Certificate: Program offered by Chicago Center for Teaching and Learning 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 and Learning
2022	Winter	Seminar and Workshop on Teaching statement and Portfolio, Chicago Center for Teaching and Learning
2021	Fall	Fundamentals of Teaching in Science: Workshop series offered by Chicago Center for Teaching and Learning 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 and Learning on student-centered pedagogical strategies for designing and implementing an undergraduate course

Courses taught at UC Riverside

2025	Fall	Linear Algebra I (Math 131)
2025	Fall	Geometry (Math 133)
2025	Spring	Introduction to Discrete Structures (Math 11/CS 11)
2025	Spring	Introduction to Ordinary Differential Equations for Physical Sciences and Engineering (Math 45/EE 20)
2025	Winter	Precalculus: An Introduction to Functions I (Math 6A)
2025	Winter	Precalculus: An Introduction to Functions I (Math 6A)
2024	Fall	Introduction to Discrete Structures (Math 11/CS 11)
2024	Fall	Introduction to Discrete Structures (Math 11/CS 11)
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