CURRICULUM VITAE
February 2026

Name: *Lisa Carbone*

E-mail address: *lisa.carbone@rutgers.edu*

Web address: *http://www.math.rutgers.edu/∼carbonel*

Undergraduate Education: *Bachelor of Science (Honors)*, University of Melbourne, (1988)

Postgraduate Education

Doctor of Philosophy, Columbia University, (1997)

Master of Philosophy, Columbia University, (1997)

Master of Arts, Columbia University, (1993)

Master of Science, University of Melbourne, (1992)

PhD Advisor: *Hyman Bass*

Honors:

Fellow of the Australian Mathematical Society, (2022–present)

Pierre Bonelli Chair Fellow, Institut des Hautes Études Scientifiques, (2010)

Academic Positions

Professor of Mathematics, Rutgers University (2017–present)

Associate Professor of Mathematics, Rutgers University (2005 – 2017)

Tenure Track Assistant Professor of Mathematics, Rutgers University (2001– 2005)

Benjamin Peirce Assistant Professor of Mathematics, Harvard University (July 1997–Aug 2001)

Visiting Assistant Professor of Mathematics, Yale University (July 1998–July 1999)

Affiliations:

Trusted Tester, Google Gemini Deep Think (2025–present)

Member, Georgia Tech AI4Math Lab (2025–present)

External Member, Laboratory for Artificial Intelligence in Mathematics Education, Stevens Institute of Technology (2025–present)

Collaborator, Sequencelib, formalizing sequences from The On-Line Encyclopedia of Integer Sequences (OEIS) in Lean 4, Texas Advanced Computing Center, UT Austin, (2026–present)

Visiting Positions

University of Melbourne, Visiting Scholar (November 2024 - January 2025)

Institute for Advanced Study, School of Natural Sciences, Visitor (January 2022 - December 2023)

Institute for Advanced Study, School of Natural Sciences, Member (Sabbatical Visitor) (January - December 2021)

IHÉS (Institut des Hautes Études Scientifiques), 6 week visitor (Summer 2019)

University of Melbourne, Visiting Scholar (June 2009, June 2010, December 2011, January 2014, July 2014, July 2015, July-August 2017)

Università degli Studi dell'Insubria / Politecnico di Milano, (June 2015, June 2017)

IHÉS (Institut des Hautes Études Scientifiques), 2 week visitor (June 2012, May 2013, May 2015)

Kyoto University, Visitor during sabbatical at Rutgers (March–April 2014)

Institut Henri Poincaré, Visitor during sabbatical at Rutgers (February 2014)

IHÉS (Institut des Hautes Études Scientifiques), Visitor, (December 2012)

IHÉS (Institut des Hautes Études Scientifiques), 2 month visitor (Summer 2011)

University of Canterbury, Erskine Visiting Professor during sabbatical at Rutgers (July–August 2010)

IHÉS (Institut des Hautes Études Scientifiques), sabbatical at Rutgers (Spring 2010)

University of Sydney, Visiting Scholar, (July 2005, July 2006)

University of California, San Diego, Visiting Scholar during sabbatical at Rutgers (Fall 2002)

Yale University, Visiting Fellow, (frequent short visits) (1999–2000, 2000–2001)

University of Melbourne, Visiting Research Fellow, (June–July 1999, June–August 2002)

Institute of Mathematics, Hebrew University of Jerusalem, Visiting Research Fellow, (June 2000)

Hebrew University of Jerusalem, Visiting Research Fellow, (May 1998)

University of Hong Kong, Visiting Research Fellow, (Summers 1998–2002)

Universita' degli Studi di Roma, Visiting Research Fellow, (Jan 1996)

(1991–1992)

Research Awards and Grants

National Science Foundation Award 2315056, Directorate for STEM Education, Collaborating with Mathematicians to Enhance Teaching (COMET), 2023–2026

Simons Foundation, Mathematics and Physical Sciences-Collaboration Grants for Mathematicians Award Number: 961267, 2022–2027

Simons Foundation, Mathematics and Physical Sciences-Collaboration Grants for Mathematicians, Award Number: 422182, 2016 – 2022

NSF stipend to attend Trimester on 'Random walks and asymptotic geometry of groups' at Institut Henri Poincaré, February 2014

National Science Foundation Principal Investigator Award, #DMS-1101282, (2011–2014)

National Science Foundation Principal Investigator Award, #DMS-0701176, (2007–2010, extended to 2011)

National Science Foundation Principal Investigator Award, #DMS-0401107, (2004–2007)

National Science Foundation Principal Investigator Award, #DMS-0100149, (2001–2004)

National Science Foundation Principal Investigator Award, #DMS-9800604, (1998–2001)

US–Israel Bi–national Science Foundation Grant, (2000–2003)

Organizing Conferences and Workshops

Mini-Course on 'Unveiling Infinite Symmetries: A Mini Course on Algebraic Structures of Generalized Kac-Moody Types', Summer meeting of the Canadian Mathematical Society, University of Saskatchewan, June 2024

Special Session on 'New Developments in infinite dimensional Lie algebras, vertex operator algebras and the Monster', Joint Meeting of the American Mathematical Society and the Unione Matematica Italiana from July 2024, Universitá degli Studi di Palermo, Italy.

Research team leader, Women in Noncommutative Algebra and Representation Theory 3 (WINART3), Banff International Research Station, April 2022, March 2025

Program committee, Women and Mathematics program at IAS, sponsored by IAS, Princeton University and NSF (2014–2024)

Organizer, Summer school on 'Geometric and random methods in group theory', Women and Mathematics program, Institute for Advanced Study, May–June 2017

Organizer, Computational group theory workshop as part of Princeton Day, Women and Mathematics program, Institute for Advanced Study, June 2017

Organizer, Conference on 'Computational math and applications', Rutgers University, December 2016

Organizer, Conference on 'Geometric and asymptotic group theory with applications', Stevens Institute of Technology, June 2016

Organizer, Special Semester on Analysis and Group Actions on Trees and Buildings, Spring 2006 http://www.math.rutgers.edu/ ∼carbonel Funded in Part by NSF, DIMACS and the Australian Research Council

Organizer, Conference on 'Groups and Algebras in M–theory', Rutgers University, May 2005 http://www.math.rutgers.edu/ ∼carbonel, Funding from NSF

Sphere Packings, Lattices, and Infinite Dimensional Algebra, August 16 to August 20, 2004, at the American Institute of Mathematics, Palo Alto, California, Organized by Lisa Carbone, Noam Elkies, and Jim Lepowsky http://www.aimath.org/ARCC/workshops/spherepacking.html

Refereed journal articles and preprints

[52] Carbone, Lisa *Advancing mathematics research with generative AI*, Submitted (2025), https://www.arxiv.org/abs/2511.07420

[51] Bass, Hyman, Carbone, Lisa, Lai, Yvonne *Interview with Hyman Bass*, Notices Amer. Math. Soc. 72 (2025), no. 6, 653–665.

[50] Carbone, L., Jurisich, E. and Murray, S. H. *A Lie group analog for the Monster Lie algebra*, Submitted (2026), arXiv:2311.11078v1 [math.RT]

[49] Ali, A. and Carbone, L., *Eisenstein series on rank 2 Kac–Moody groups over finite fields*, Forum Math. 38 (2026), no. 4, 1257–1296, https://arxiv.org/pdf/2108.02919.pdf

[48] L. Carbone, T. Coelho, S. H. Murray, F. Thurman and S. Zhu *Growth of root multiplicities along imaginary root strings in Kac–Moody algebras*, Communications in Algebra, 54 (2026), no. 3, 909–924, arXiv:2403.01687v1 [math.RT]

[47] Ali, A., Carbone, L., Jurisich, E. and Murray, S. H. *Prosummability In Kac–Moody groups*, To appear, Contemporary Math (2025)

[46] Carbone, L. and Jurisich, E. *A Magnus Group construction for a class of Borcherds algebras*, To appear, Contemporary Math (2025)

[45] Carbone, L. *Symmetries of Borcherds algebras*, To appear, Contemporary Math (2025)

[44] Ali, A., Carbone, L. and Murray, S. H. *Chevalley groups - a representation theoretic approach*, European Journal of Math, (2025), no. 1, Paper No. 11, arXiv:2408.16895v1 [math.RT]

[43] Darlayne Addabbo, Lisa Carbone, Elizabeth Jurisich, Maryam Khaqan and Scott H. Murray, *Vertex operators for imaginary $\mathfrak{gl}_2$-subalgebras in the Monster Lie Algebra*, J. Pure Appl. Algebra 228 (2024), no.7, Paper No. 107651, 25 pp., arXiv:2210.16178v1 [math.RT]

[42] Abid Ali, Lisa Carbone, Dongwen Liu, Scott H. Murray, *Strong integrality of inversion subgroups of Kac–Moody groups*, J. Lie Theory 34 (2024), no.2, 453–468, arXiv:2210.01644v1 [math.RT]

[41] Carbone, L., Garland, H., Lee, K-H, Liu D. and Miller, S. D. *On the convergence of Kac–Moody Eisenstein series*, American Journal of Mathematics, Volume 146, Number 5, October pp. 1253-1274 (2024), arXiv:2005.13636v1 [math.NT]

[40] Carbone, L. and Paquette, N. *Imaginary reflections and discrete symmetries in the Heterotic Monster*, Preprint (2022), arXiv:2202.09720v3 [hep-th]

[39] Carbone, L., Jurisich, E. and Murray, S. H. *Constructing a Lie group analog for the Monster Lie algebra*, Lett. Math. Phys. 112 (2022), no. 3, Paper No. 43, 16 pp, arXiv:2002.06658v1 [math.RT]

[38] Carbone, L., Lee, K.-H. and Liu, D. *Entirety of cuspidal Eisenstein series on Kac–Moody groups*, Algebra Number Theory 16 (2022), no. 5, 1099–1119, arXiv:2008.11559 [math.NT][math.RT]

[37] Lisa Carbone, K. N. Raghavan, Biswajit Ransingh, Krishanu Roy, Sankaran Viswanath, *π-systems of symmetrizable Kac-Moody algebras*, Lett. Math. Phys. 111 (2021), no. 1, 5. arXiv:1902.06413v1 [math.RA]

[36] Carbone, L., Kownacki, M., Murray, S. H. and Srinivasan, S. *Commutation relations and structure constants for rank 2 Kac–Moody algebras*, Journal of Algebra, Volume 566, (2021), Pages 443–476 arXiv:1804.02308

[35] Carbone, L., Nanda, V. and Naqvi, Y. *Equivariant simplicial reconstruction*, SIAM J. Appl. Algebra Geom. 4 (2020), no. 4, 532–552 arXiv:1807.09396

[34] Carbone, L., Feingold, A. J. and Freyn, W. *A lightcone embedding of the twin building of a hyperbolic Kac–Moody group*, SIGMA 16 (2020), 045, 47 pages, arXiv:1606.05638v2 [math.GR]

[33] Carbone, L., Cederwall, M. and Palmkvist, J. *Generators and relations for Lie superalgebras of Cartan type*, Journal of Physics A: Mathematical and Theoretical, Volume 52, Number 5, January 2019, arXiv:1802.05767v1 [math.RT]

[32] Carbone, L., Cederwall, M. and Palmkvist, J. *Generators and relations for (generalised) Cartan type superalgebras*, J. Phys. Conf. Ser. 1194 (2019) no.1, 012020, arXiv:1812.03068v2 [math.RT]

[31] Carbone, L. and Wagner, F. *Uniqueness of representation–theoretic hyperbolic Kac–Moody groups over $\mathbb{Z}$*, Contemp. Math., 695, 51–64 Amer. Math. Soc., Providence, RI, 2017, arXiv:1512.04623

[30] Bao, L. and Carbone, L. *Kac–Moody groups and automorphic forms in low dimensional supergravity theories*, Conference on Lie Algebras, Vertex Operator Algebras, and Related topics, edited by K. Barron, E. Jurisich, H. Li, A. Milas and K. C.Misra, (2016), Contemp. Math., 695, 29–40, Amer. Math. Soc., Providence, RI, 2017, arXiv:1602.02319

[29] Allcock, D. and Carbone, L. *Finite presentation of hyperbolic Kac–Moody groups over rings*, J. Algebra 445, 232–243, (2016), arXiv:1409.5918

[28] Ali, A and Carbone, L *Congruence subgroups of lattices in rank 2 Kac–Moody groups over finite fields*, Communications in Algebra, Volume 44, Issue 3, (2016), 1236–1264

[27] Carbone, L., Murray, S. H. and and Sati, H. *Integral group actions on symmetric spaces and discrete duality symmetries of supergravity theories*, J. Math. Phys. 56, no. 10, 103501, 26 pp. (2015) arXiv:1407.3370

[26] Carbone, L., Conway, A., Freyn, W. and Penta, D. *Weyl group orbits on Kac–Moody root systems*, J. Phys. A: Math. Theor. 47 445201, (2014) arXiv:1407.3375

[25] Carbone, L., Freyn, W and Lee, K.–H. *Dimensions of Imaginary Root Spaces of Hyperbolic Kac–Moody Algebras*, In 'Recent Advances in Representation Theory, Quantum Groups, Algebraic Geometry, and Related Topics': Vol 623 of Contemporary Mathematics, Ed: Pramod et al, AMS (2014)

[24] Carbone, L., Lee, K.–H. and Liu, D. *Eisenstein series on rank 2 hyperbolic Kac–Moody groups over* $\mathbb{R}$ Math. Annalen pp 1–25 (2016), arXiv:1306.3280

[23] Carbone, L, Rips, E *Reconstructing group actions*, IJAC, Volume No. 23, Issue No. 2, 255–323 (2013)

[22] Carbone, L, Kangaslampi, R and Vdovina, A *Groups acting simply transitively on hyperbolic buildings*, LMS Journal of Computation and Mathematics, Vol 15, 101–112 (2012)

[21] Carbone, L, Cobbs, C and Rosenberg, G *Tree lattice subgroups*, Groups Complex. Cryptol. 3, No. 1, (2011) 1–23

[20] Carbone, L and Cobbs, C *Infinite descending chains of cocompact lattices in Kac–Moody groups*, Journal of Algebra and Its Applications Vol 10, No. 6, 1–33 (2011)

[19] Carbone, L and Naqvi, Y *Hyperbolic Kac–Moody Weyl groups, billiard tables and and actions of lattices on trees*, Journal of Pure and Applied Algebra Vol 213 No. 3, 495–518 (2012)

[18] Andersen, K., Carbone, L. and Penta, D. *Kac–Moody Fibonacci sequences, hyperbolic golden ratios, and real quadratic fields*, Journal of Number Theory and Combinatorics Vol Vol 2, No. 3, 245–278 (2011)

[17] Carbone, L, Cobbs, C and Murray, S *Fundamental domains for congruence subgroups of* SL_2 *in positive characteristic,* Journal of Algebra Vol 325 431–439 (2011)

[16] Carbone, L., Chung, S., Cobbs, L., McRae, R., Nandi, D., Naqvi Y. and Penta, D. *Classification of hyperbolic Dynkin diagrams, root lengths and Weyl group orbits*, Journal of Physics. A: Math. Theor. 43 155209, (2010)

[15] Carbone, L, Ershov, M and Ritter, G *Abstract simplicity of complete Kac–Moody groups over finite fields*, Journal of Pure and Applied Algebra (2008) Vol 212, 2147–2162

[14] Carbone, L and Ciobanu, L *Characterization of Non-minimal Tree Actions*, Revue Roumaine de Mathematiques Pures et Appliquees, (Romanian Journal of Pure and Applied Mathematics) Vol 52 No. 4, (2007) 377-388

[13] Carbone, L and Clark, D *Bass–Tits Minimization of Automata, Quotients of Trees and Diameters*, Journal of Pure and Applied Algebra Vol 204 (2), 300–316 (2006)

[12] Carbone, L *Non-minimal Tree Actions and the Existence of Non-uniform Tree Lattices*, Bulletin of the Australian Mathematical Society, Vol 70 257–266 (2004)

[11] Carbone, L and Garland, H *Existence of Lattices in Kac–Moody Groups over Finite Fields*, Communications in Contemporary Math, Vol 5, No.5, 813–867 (2003)

[10] Carbone, L and Rosenberg, G *Lattices on Non-uniform Trees*, Geometriae Dedicata Vol 98, 161–188 (2003)

[9] Carbone, L *The Tree Lattice Existence Theorems* Comptes Rendus de l'Academie des Sciences. Serie I, Mathematique, 335 223–228 (2002)

[8] Carbone, L and Clark, D *Lattices on Parabolic Trees*, Communications in Algebra, Vol. 30, Issue 4, 1853–1886 (2002)

[7] Carbone, L and Rosenberg, G *Infinite Towers of Tree Lattices*, Mathematical Research Letters Vol 8, 1–10 (2001)

[6] Carbone, L and Garland, H *Lattices in Kac–Moody Groups*, Mathematical Research Letters Vol 6, 439–447 (1999)

[5] Carbone, L *Constructing Tree Lattices*, Algebras and Combinatorics. An International Congress, ICAC '97, Hong Kong (edited by K. P. Shum, and E. Taft) 63–97, Springer (1999)

Books

[4] Carbone, L *Non-uniform Lattices on Uniform Trees*, Memoirs of the AMS, vol. 152, no. 724, 127 pages, ISBN 0821827219 (2001)

Chapters in Books

[3] Bass, H, Carbone, L, and Rosenberg, G *The Existence Theorem for Tree Lattices*, Appendix [BCR] in '*Tree Lattices*' by Hyman Bass and Alex Lubotzky Progress in Mathematics 176, Birkhauser, Boston, 167–184 (2000)

[2] Carbone, Lisa and Goddard, Wayne, *Characterizations and Types of Trees*, Handbook of Discrete and Combinatorial Mathematics. Ed. Kenneth H. Rosen. Boca Raton. CRC Press. (2016)

[1] Carbone, Lisa, *A filtration of the chain complex of a rewriting system*, in 'Geometric and computational perspectives on infinite groups', Ed. G. Baumslag, D. B. A. Epstein, R. Gilman, H. B. Short, and C. C. Sims. New Brunswick, NJ, 9–26, DIMACS Ser. Discrete Math. Theoret. Comput. Sci., 25, Amer. Math. Soc., Providence, RI, (1996).

Mathematics education

Publications

Johnson, E., Weber, K., Fukawa-Connelly, T., Mahmoudian, H., and Carbone, L. *Collaborating with mathematicians to use active learning in university mathematics courses: The importance of attending to mathematicians obligations*, Educ Stud Math 119, 145161 (2025). https://doi.org/10.1007/s10649-024-10381-x

Blackwell, S., Carbone, L., Katzen, S., Mejía Ramos, J. P., Ptak, C., Sandberg, A., and Seneres, A. *Impact of active learning on course performance and self-reported learning gains in a proof-based mathematics course*, 4th Northeastern Conference on Research in Undergraduate Mathematics Education, Online conference (2020): http://pcrg.gse.rutgers.edu/nerume2020

Seminars

Online Seminar On Undergraduate Mathematics Education, MIT, November 2023 *Active learning in proof-based math courses*, https://olsume.org/wp-content/uploads/2023/11/carbone-trimmed.mp4

Research project on 'Collaborating with Mathematicians to Enhance Teaching (COMET)'

Obtained an NSF grant from the Directorate for STEM Education to develop and evaluate a model for designing active learning strategies for undergraduate mathematics instruction in proof-based linear algebra in which mathematicians and mathematics educators work together to develop active learning pedagogy.

Research project on 'Active learning in the study of mathematical reasoning'

I introduced the Learning assistants program and interactive workshops into 640:300 Introduction to mathematical reasoning in 2017. Since then, I have liased with the Rutgers Learning Centers to continue to implement this program and have developed workshop problems and mentored learning assistants since Spring 2017.

Conducted education research project jointly with the Learning Centers and the Graduate School of Education at Rutgers University, gathered and analyzed data on comprehension, student engagement and performance (with Alice Seneres and Pablo Mejia-Ramos, 2017 -2019).

Mini-courses

Unveiling infinite dimensional symmetries, CMS Summer Meeting, Saskatoon, Sasketchewan, May 2024

Chevalley groups and Lie algebras with built-in structure constants, ACE Short Courses, AMSI Research Institute, University of Melbourne, July 2017.

Lecture notes:

Lecture 1: http://research.amsi.org.au/wp-content/uploads/sites/3/2017/08/melbournecourseslides1.pdf

Lecture 2: http://research.amsi.org.au/wp-content/uploads/sites/3/2017/08/melbournecourseslides2.pdf

Lecture 3: http://research.amsi.org.au/wp-content/uploads/sites/3/2017/08/melbournecourseslides3.pdf

Lecture 4: http://research.amsi.org.au/wp-content/uploads/sites/3/2017/08/melbournecourseslides4.pdf

Videos:

Video 1: http://amsi.org.au/videos/algebraic_groups_lecture_1.webm

Video 2: http://amsi.org.au/videos/algebraic_groups_lecture_2.webm

Video 3: http://amsi.org.au/videos/algebraic_groups_lecture_3.webm

Video 4: http://amsi.org.au/videos/algebraic_groups_lecture_4.webm

Notes and preprints

Lecture on Tensors, wedges and representations, IMR 2012 http://www.math.rutgers.edu/∼carbonel/pdfs/IMR2012.pdf

Conjecture on the structure of fundamental domains for nonuniform lattices in Kac–Moody groups, Presented at the workshop 'DIAMANT meets GQT', Lorentz Center, Leiden, Netherlands, October 2008 http://www.math.rutgers.edu/∼carbonel/html

Sphere packings, lattices, groups and infinite dimensional algebra, Open problems and discussion, http://www.aimath.org/WWN/spherepacking/spherepacking.pdf

On the Classification of Rank 1 Groups Over Non-archimedean Local Fields, http://www.math.rutgers.edu/∼carbonel/

Plenary Lectures

Conference on Artificial Intelligence and Mathematical Sciences 2025, 'AI tools for infinite dimensional symmetry groups', Shkodër, Albania (December 2025)

Workshop on Kac–Moody geometry, 'Integrality of Kac–Moody groups', Kiel University, Germany (July 2023)

SE Lie Theory Workshop XII,'A Lie group analog for the Monster Lie Algebra', College of Charleston, (October 2021)

Geometry, Analysis and Groups, 'A Lie group analog for the Monster Lie Algebra', Euler institute, St. Petersburg, Russia (October 2018)

Manhattan Algebra Day, 'A Lie group analog for the Monster Lie Algebra', CUNY Graduate Center (December 2017)

Lie Algebras, Vertex Operator Algebras, and Related Topics, 'Finite presentations of hyperbolic Kac–Moody groups', University of Notre Dame, (August 2015)

Manhattan Algebra Day, 'Hyperbolic Kac–Moody Weyl groups, lattices and actions on trees', CUNY Graduate Center (December 2009),
Slides: http://www.math.rutgers.edu/ carbonel/pdfs/TessellationsTalk.pdf

Conference on Noncommutative Geometry and Geometry Over the Field with One Element, 'Group functors over fields and Tits geometries' (3 lectures), Vanderbilt University, (May 2009)
Slides: http://www.math.rutgers.edu/ carbonel/pdfs/BuildingsLectures.pdf

Discrete, interactive and algorithmic mathematics, algebra and number theory meets geometry and quantum theory (DIAMANT meets GQT) 'Lattices, buildings and Kac–Moody groups') Lorentz Center, Leiden, Netherlands, (October 2008)

Conference on Examples of Groups, 'Exotic buildings I and II', Ohio State University, (June 2008)

Conference on Noncommutative Geometry and Geometry Over the Field with One Element, 'Kac–Moody groups, finite fields and Tits geometries', Vanderbilt University, (May 2008)

Connections for Women: Classics of Geometric Group Theory 'Trees and group actions I and II', MSRI, Berkeley (Aug 2007)

57th ALGEBRA DAY, 'Lorentzian Kac–Moody Groups', The Ottawa-Carleton Institute for Mathematics and Statistics (October 2005)

Department Colloquia

SUNY Polytechnic Institute, 'Lie group analogs for infinite dimensional Lie algebras', October 2024

Center for Mathematical Sciences and Applications, Harvard University, 'Symmetry groups in infinite dimensions', September 2024

University of Melbourne, 'Lie group analogs for infinite dimensional Lie algebras', August 2023

University of Arizona, 'Lie group analogs for infinite dimensional Lie algebras', April 2023

University of California, Santa Cruz, 'A Lie group analog for the Monster Lie Algebra', October 2021

University of Warwick, 'A Lie group analog for the Monster Lie Algebra', February 2021

Institute for Advanced Study, Women and Mathematics program, 'Free groups from free Lie algebras', May 2017

University of Connecticut, Storrs, 'Simply laced lie algebras with built–in structure constants', April 2013

University of Canterbury, 'Discrete symmetries and infinite dimensional Lie groups', July 2010

University of Canberra, 'Discrete symmetries and infinite dimensional Lie groups', June 2010

Brown University, 'Lattices, buildings and Kac–Moody groups', April 2008

Rice University, 'Hyperbolic Kac–Moody Groups', October 2006

Rutgers University, Newark, 'Hyperbolic Kac–Moody Groups', March 2006

College of Charleston 'Lattices, Buildings and Kac–Moody Groups', March 2005

University of California, San Diego, 'The tree lattice existence theorems', February 2001

Rutgers University, 'The tree lattice existence theorems', January 2001

University of Illinois at Chicago, 'The tree lattice existence theorems', January 2001

Yale University, 'The tree lattice existence theorems', (September 2000)

Conference Presentations and Seminars

Georgia Tech, Foundations of AI Seminar, AI tools for infinite dimensional symmetry groups, (February 2026)

City University of New York Graduate Center, 'A group amalgam for the Monster Lie algebra', (October 2025)

Rutgers University, Lie Group/Quantum Math Seminar 'AI tools for advanced math' (October 2025)

SUNY Albany, Fall Eastern Sectional Meeting, Special Session on Representations of Lie Algebras, Vertex Operators, and Related Topics, 'A Lie group analog for the Monster Lie Algebra', (October 2024)

Universitá degli Studi di Palermo, Italy, Special Session at Joint Meeting of the American Mathematical Society and the Unione Matematica Italiana, , 'Infinite dimensional Lie algebras and their symmetries', July 2024

NJIT, SIAM, NNP 2023, Minisymposium on Applied Group Theory and Applications, 'Constructing Lie groups for infinite dimensional Lie algebras', October 2023

Rutgers University, Lie Group/Quantum Math Seminar 'Integrality of Kac–Moody groups' September 2023

University of Arizona, Mathematical physics seminar, 'A monstrous Lie group', April 2023

University of Georgia, Algebra Seminar, 'A Lie group analog for the Monster Lie Algebra' November 2021

Institute for Advanced Studies, School of Natural Sciences, Group Meeting, 'A toolkit for infinite dimensional symmetries', October 2021

Rutgers University, Lie Group/Quantum Math Seminar 'Imaginary reflections and discrete symmetries in the Heterotic Monster' September 2021

Rutgers University, Lie Group/Quantum Math Seminar 'Imaginary root strings and Chevalley-Steinberg group commutators for hyperbolic Kac–Moody algebras', March 2021

Rutgers University, Lie Group/Quantum Math Seminar 'Complete pro-unipotent automorphism group for the monster Lie algebra', January 2021

Rutgers University, Women and science honours seminar, School of Environmental and Biological Sciences, 'Female participation in STEM professions', (December 2019)

University of Toronto, Dynamics Seminar, 'A Lie group analog for the Monster Lie Algebra', (October 2019)

University of Binghamton, Fall Eastern Sectional Meeting, Special Session on Representations of Lie Algebras, Vertex Operators, and Related Topics, 'A Lie group analog for the Monster Lie Algebra', (October 2019)

City University of New York Graduate Center, 'Associating groups to infinite dimensional Lie algebras', (October 2019)

Rutgers University, Lie Groups/Quantum Math Seminar, 'Imaginary reflections and automorphisms of the monster Lie Algebra', (April 2019)

Temple University, Algebra seminar 'A Lie group analog for the Monster Lie Algebra', (December 2017)

Gothenburg University, Seminariet i Algebraisk geometri och talteori 'A Lie group analog for the Monster Lie Algebra', (November 2017)

University of Oxford, Topology Seminar 'A Lie group analog for the Monster Lie Algebra', (November 2017)

Rutgers University, Lie Groups/Quantum Math Seminar, 'A Lie group analog for the Monster Lie Algebra', (October 2017)

University of Melbourne, Geometry and Topology Seminar, 'Groups for Borcherds Algebras', (July 2017)

Hunter College, Spring Eastern Sectional Meeting, Special Session on Infinite Permutation Groups, Totally Disconnected Locally Compact Groups, and Geometric Group Theory, 'Commutation relations and structure constants for Kac-Moody groups', May 2017

College of Charleston, South Eastern AMS Sectional Meeting, Special Session on Representation Theory and Algebraic Mathematical Physics, 'Lie algebras with built-in structure constants', (March 2017)

Rutgers Undergraduate Mathematics Association, Lie algebras with built-in structure constants, (February 2017)

Rutgers University, Lie Groups/Quantum Math Seminar, 'Arithmetic constructions of hyperbolic Kac–Moody groups', (February 2016),
Slides: http://www.rci.rutgers.edu/ yzhuang/math/CarboneSlidesRU.pdf

University of Melbourne, Geometry and Topology Seminar, 'Finite presentations of hyperbolic Kac–Moody groups', (July 2015)

L'Université Paris Diderot - Paris 7, Séminaire de théorie des groupes, 'Finite presentations of hyperbolic Kac–Moody groups', (May 2015)

IHÉS, Séminaire de Mathématique,'Finite presentations of hyperbolic Kac–Moody groups', (May 2015)

University of Melbourne, Geometry and Topology Seminar, 'Presentation of Kac–Moody groups over rings', (July 2014)

Kyoto University, Differential geometry seminar, 'Infinite dimensional Chevalley groups and Kac–Moody groups over $\mathbb{Z}$', (April 2014)

Temple University, AMS Eastern sectional meeting, 'Simply laced Lie algebras and Kac–Moody algebras with built–in structure constants', (October 2013)

University of Canberra, Algebra seminar, 'Simply laced Lie algebras and Kac–Moody algebras with built–in structure constants', (July 2013)

University of Melbourne, Geometry and Topology Seminar, 'Simply laced Lie algebras and Kac–Moody algebras with built–in structure constants', (July 2013)

IHÉS Séminaire de Mathématique, 'Simply laced Lie algebras and Kac–Moody algebras with built–in structure constants', (May 2013)

College of Charleston, Algebra seminar, 'Simply laced lie algebras with built–in structure constants', (March 2013)

New York Algebra Colloquium, City University of New York Graduate Center, 'Simply laced lie algebras with built–in structure constants', (February 2013)

University of Melbourne, Geometry and Topology Seminar, 'A lightcone construction of the Tits building of a hyperbolic Kac–Moody group', (Dec 2011)

Representation Theory Seminar, City University of New York Graduate Center, 'A lightcone construction of the Tits building of a hyperbolic Kac–Moody group', (Nov 2011)

IHÉS, Séminaire de Mathématique, 'Kac–Moody groups as infinite dimensional Chevalley groups', (June 2011)

Université Paris-Sud, Groupe de travail, 'Théorie Géométrique des Groupes d'Orsay', 'Kac–Moody groups as infinite dimensional Chevalley groups', (June 2011)

Rutgers University, Lie Groups/Quantum Math Seminar, 'Kac–Moody groups as infinite dimensional Chevalley groups', (May 2011)

Rutgers University, Number Theory Seminar, 'Eisenstein series on Kac–Moody groups over finite fields', (December 2010)

Centre de Recherches Mathématiques, Université de Montréal, Workshop on Group Actions and Dynamics, 'Discrete symmetries and infinite dimensional Lie groups', (October 2010)

University of Melbourne, Algebra, geometry and topology seminar, 'Discrete symmetries and infinite dimensional Lie groups', (June 2010)

New Jersey Institute of Technology, AMS 2010 Spring Eastern Sectional Meeting in Newark, Special Session on Groups, Computations, and Applications, '$\mathbb{Z}$–forms of Kac–Moody groups', (May 2010)

Florida Atlantic University, AMS sectional meeting in Boca Raton, Special session on Lattices, Coxeter groups, and buildings, 'The Haagerup property, Property (T) and the Baum-Connes conjecture for lattices in locally compact Kac–Moody groups', (Oct 2009)

Pennsylvania State University, Fall Eastern Meeting of the AMS, Special Session on Arithmetic and Profinite Groups, 'The Haagerup property, Property (T) and the Baum–Connes conjecture for lattices in locally compact Kac–Moody groups', (Oct 2009)

University of Melbourne, Algebra, geometry, topology seminar, 'Hyperbolic Kac–Moody symmetry, actions on buildings and applications', (June 2009)

JAMI Johns Hopkins University, Lie Groups Seminar, 'Hyperbolic Kac–Moody symmetry, arithmetic and applications', (April 2009)

Rutgers University, Lie Groups Seminar, 'Hyperbolic Kac–Moody symmetry and applications', (March 2009)

University of Wisconsin, Madison, Algebraic Geometry Seminar, 'Kac–Moody groups, finite fields and Tits geometries', (December 2008)

New York Algebra Colloquium, City University of New York Graduate Center, 'Lattices, buildings and Kac–Moody groups', (October 2008)

Brown University, Group actions seminar 'Tits buildings for hyperbolic Kac–Moody groups', (May 2008)

Rutgers University, Faculty Research Perspectives, 'Kac–Moody symmetry in mathematics and physics', (Feb 2008)

University of Canterbury, Edward Percival Field Station, Kaikoura, New Zealand, Conference on Finite Group and Representations, 'Lattices, trees and Kac–Moody groups', (Jan 2008)

DIMACS, Rutgers University, REU lecture 'Trees and group actions', (July 2007)

City University of New York, Graduate Center, Group Theory Seminar, 'Hyperbolic Kac–Moody Groups', (November 2005)

Universita' degli Studi di Roma (La Sapienza), Seminario di Analisi Armonica, 'Hyperbolic Kac–Moody Groups', (October 2005)

University of Newcastle, Australia, Analysis Seminar, 'Lorentzian Kac–Moody Groups', (July 2005)

University of Delaware, AMS meeting, Special Session on Arithmeticity of Lattices, 'Lattices in Kac–Moody Groups', (April 2005)

University of Chicago, Geometry/Topology Seminar, 'Lattices, Buildings and Kac–Moody Groups', (November 2004)

Rider University, AMS meeting, Special Session on Geometry and Arithmetic of Lattices, 'Congruence subgroups of lattices in rank 2 Kac–Moody groups over finite fields', (April 2004)

Rutgers University, 'Faculty Research Perspectives', 'Group actions, lattices and Kac–Moody groups', (April 2004)

University of Sydney, Algebra Seminar, 'Arithmetic structure of lattices in rank 2 Kac–Moody groups over finite fields', (July 2003)

International Conference on Group theory, Combinatorial, Geometric and Dynamical Aspects of Infinite Groups, Gaeta, Italy, 'Congruence subgroups of lattices in rank 2 Kac–Moody groups over finite fields', (June 2003)

Courant Institute, NYU, 986th AMS meeting, Special Session on Combinatorial and Statistical Group Theory, 'Arithmetic structure of lattices in rank 2 Kac–Moody groups over finite fields', (April 2003)

Rutgers University, Lie Groups/Quantum math seminar, 'Congruence subgroups of lattices in rank 2 Kac–Moody groups over finite fields', (April 2003)

University of California, Berkeley, Group Theory Seminar, 'Group actions, lattices and Kac–Moody groups', (December 2002)

University of California, San Diego, Algebra/Number Theory Seminar, 'Group actions, lattices and Kac–Moody groups', (December 2002)

University of California, San Diego, Graduate Colloquium, 'Trees and SL_2', (December 2002)

University of Illinois, Urbana–Champaign, Group Theory Seminar, 'Lattices in Kac–Moody groups over finite fields', (September 2002)

International Congress of Mathematics, Satellite Conference on Algebra, Suzhou, China, 'The tree lattice existence theorems' (September 2002)

University of Melbourne, Geometry/Topology Seminar, 'Arithmetic structure of lattices in rank 2 Kac–Moody groups over finite fields', (August 2002)

Institute of Mathematics, The University of Hong Kong, Conference on Combinatorial and Computational Algebra, 'Lattices in Kac–Moody groups over finite fields', (June 2002)

Université de Montreal, 976th AMS meeting, Special Session on Combinatorial and Geometric Group Theory, 'Lattices in Kac–Moody groups over finite fields', (May 2002)

Rutgers University, Algebra Seminar, 'Lattices in Kac–Moody groups over finite fields', (April 2002)

SUNY at Binghamton, Topology Seminar, 'Reconstructing group actions', (February 2002)

University of Sydney, Algebra Seminar, 'Trees and group actions', (July 2001)

Australian National University, Institute of Mathematics, Algebra Seminar, 'The tree lattice existence theorems', (July 2001)

Institute of Mathematics, University of Hong Kong, Conference on Computational and Combinatorial Algebra, 'Reconstructing group actions', (June 2001)

Brandeis University, Algebra seminar, 'The tree lattice existence theorems', (April 2001)

Brown University, Geometry and Topology Seminar, 'Reconstructing group actions' (February 2001)

University of California, Berkeley, Special Lecture, 'The tree lattice existence theorems', (February 2001)

Harvard University, Differential Geometry seminar, 'Reconstructing group actions', (February 2001)

University of Chicago, Geometry/Topology Seminar, 'The tree lattice existence theorems', (January 2001)

University of Maryland, Topology/Geometry Seminar, 'The tree lattice existence theorems', (November 2000)

University of Illinois at Urbana-Champaign, Group Theory seminar, 'The tree lattice existence theorems', (August 2000)

University of Melbourne, Geometry and Topology Seminar, 'The tree lattice existence theorems', (July 2000)

Institute of Mathematics, University of Hong Kong, Conference on Combinatorial Algebra, 'Deformations of lattices in SL_2 over non–archimedean local fields', (July 2000)

Hebrew University of Jerusalem, Asymptotic Group Theory Conference, 'Existence theorems for tree lattices', (May 2000)

Rutgers University, Topology Seminar, 'Existence theorems for tree lattices', (September 1999)

University of California, Berkeley, Geometric Group Theory Seminar, 'Existence theorems for tree lattices', (September 1999)

University of Melbourne, A Course of Lectures given at a Workshop on Group Theory and Topology, Joint Meeting of the Amer. Math. Soc and the Aust. Math. Soc., 'Trees and group actions', (July 1999)

University of Hong Kong, International Conference on Computational and Combinatorial Algebra, 'Lattices, trees and group actions' (June 1999)

Princeton University, Algebra Seminar, 'Existence theorems for tree lattices', (November 1998)

Albany Group Theory Conference, 'p–Adic groups', (October 1998)

Yale University, Algebra Seminar, 'p–Adic groups', (October 1998)

Yale University, A course of lectures given in the Dynamics of Group Actions , 'Lattices, trees and group actions', (October 1998)

Hebrew University of Jerusalem, Algebra Seminar, 'Lattices, trees and group actions', (June 1998)

Hebrew University of Jerusalem, Lie Groups Seminar, 'Non-uniform lattices on uniform trees', (June 1998)

Boston University, Algebra Seminar, 'Trees, lattices and SL_2', (March 1998)

Harvard University, Algebraic Number Theory Seminar, 'Non-uniform lattices on uniform trees', (November 1997)

Harvard University, Algebraic Geometry Seminar, 'Trees, lattices and SL_2', (October 1997)

Chinese University of Hong Kong, International Congress in Algebra and Combinatorics, 'Constructing tree lattices', (August 1997)

Cornell University, Topology Festival, 'Non–uniform lattices on uniform trees', (May 1997)

Columbia University, Topology Seminar, 'Non–uniform lattices on uniform trees', (May 1997)

City University of New York Graduate Center, New York Group Theory Seminar, 'Non–uniform lattices on uniform trees', (November 1996)

Ecole d'ete du CRM - Geometric Group Theory, Banff, Alberta, Canada, 'Non–uniform lattices on uniform trees', (August 1996)

Universita' degli Studi di Genova, Algebra Seminar, 'Non–uniform lattices on uniform trees' (July 1996)

European Science Foundation Conference on Algebra and Discrete Mathematics, Castelvecchio Pascoli, Italy, 'Non–uniform lattices on uniform trees', (July 1996)

Princeton University, Group Theory Seminar, 'Lattices in the automorphism group of a tree', (March 1996)

Universita' degli Studi di Roma (Tor Vergata), Geometry Seminar, 'Lattices in the automorphism group of a tree' (January 1996)

Seminars organized

Lie Groups Quantum Mathematics Seminar, Lisa Carbone, Yi–Zhi Huang, James Lepowsky, Siddhartha Sahi, http://www.math.rutgers.edu/events/lie-quantum.html

Graduate Courses

Infinite dimensional Lie algebras, Rutgers University, (Fall 2023)

Lie groups and Lie algebras, a combinatorial approach, Rutgers University, (Spring 2020)

Graduate algebra, Rutgers University, (Fall 2013, Fall 2014)

Lie algebras with built–in structure constants, Rutgers University, (Spring 2013)

Chevalley groups and infinite dimensional generalizations, Rutgers University, (Spring 2012)

Infinite dimensional Lie groups and applications, Rutgers University, (Spring 2011)

Kac–Moody Symmetry in Mathematics and Physics, Rutgers University, (Spring 2009), http://www.math.rutgers.edu/∼carbonel/html/courses.html,

Sphere Packings, Lattices and Group Actions, Rutgers University, (Fall 2003), http://www.math.rutgers.edu/∼carbonel/html/courses.html,

Kac–Moody Algebras, Harvard University, (Spring 2001) http://www.math.rutgers.edu/∼carbonel/html/courses.html

Trees and Group Actions, Yale University, (Fall 1998), http://www.math.rutgers.edu/∼carbonel/html/courses.html

Course coordination

Introduction to Mathematical Reasoning, Department of Mathematics, Rutgers University, Provided new instructors with typed lecture notes, homework assignments, quizzes and exams (Spring 2015 - Fall 2020, Spring 2022-present)

Undergraduate Teaching

AI tools for math, Lecturer, Department of Mathematics, 25-30 undergraduate/graduate students, Rutgers University, (Fall 2025, Spring 2026)

Linear algebra with proofs, Lecturer, Department of Mathematics, 25-30 undergraduate students, Rutgers University, (Spring 2024, Spring 2025, Fall 2025)

Linear algebra with proofs (Honors), Lecturer, Department of Mathematics, 25-30 undergraduate students, Rutgers University, (Spring 2024)

Introduction to Math Reasoning, Lecturer, Department of Mathematics, 25-30 undergraduate students, Rutgers University, (Spring 2002, Spring 2003, Fall 2004, Fall 2005, Spring 2006, Spring 2007, Spring 2008, Fall 2008, Fall 2009, Fall 2010, Fall 2011, Fall 2012, Fall 2014, Spring 2015, Fall 2015, Spring 2016, Spring 2018, Fall 2018, Fall 2019, Spring 2020, Fall 2020, Fall 2021, Spring 2022, Fall 2022, Spring 2023)

Abstract Algebra II (Honors), Lecturer, Department of Mathematics, 15 students, Rutgers University, (Spring 2016, Spring 2019)

Abstract Algebra I, (Honors), Lecturer, Department of Mathematics, 20 students, Rutgers University, (Fall 2015)

Introduction to Math Reasoning (Honors), Lecturer, Department of Mathematics, 20 undergrad. students, Rutgers University, (Fall 2015)

Cryptography, Lecturer, Department of Mathematics and Statistics, University of Canterbury, New Zealand, (Summer 2010)

Geometry, Lecturer, Department of Mathematics, 20 undergraduate students, Rutgers University, (Fall 2007)

Calculus 2, Lecturer, Department of Mathematics, 2 sections, 70-72 students each section, 3 credits, Rutgers University, (Spring 2004)

Introduction to Linear Algebra, Lecturer, Department of Mathematics, 25-30 undergraduate students, Rutgers University, (Fall 2001 (2 sections), Spring 2003)

Lie Algebras, Lecturer, Department of Mathematics, 2 graduate students, 3 undergraduate students, 3 credits, Harvard University, (Spring 2001)

Topology, Lecturer, Department of Mathematics, 21 undergraduate students, 3 credits, Harvard University, (Spring 2000)

Calculus 1a, Lecturer and Course Head, Department of Mathematics, 23 undergraduate students, 3 credits, Yale University, (Spring 1999)

Sets, Maps and Symmetry Groups, Lecturer, Department of Mathematics, 2 graduate students, 25 undergraduate students, 3 credits, Harvard University, (Spring 1998, Spring 2001)

Representations of Finite Groups, Lecturer, Department of Mathematics, 6 undergraduate students, 3 credits, Harvard University, (Spring 1998)

Calculus 1a, Lecturer, Department of Mathematics, 25-30 undergraduate students, 3 credits, Harvard University, (Fall 1997, Fall 1999)

Basic Math, Lecturer and Course Head, Department of Mathematics, 17–20 undergraduate students, 4.5 credits, Columbia University, (Fall 1996, Spring 1997)

College Algebra, Lecturer, Department of Mathematics, 25–30 undergraduate students, 3 credits, Columbia University, (Fall 1996, Summer 1997, Summer 1995)

Graph Theory, Recitations and some lectures, Department of Computer Science, 25–30 undergraduate students, 3 credits, Columbia University, (Fall 1995, Spring 1996)

Concrete Mathematics - A Foundation for Theoretical Computer Science Undergraduate Seminar in Mathematics, 3 credits, Columbia University, (Fall 1995)

Discrete Mathematics, Recitations and some lectures, Department of Computer Science, 25–30 undergraduate students, 3 credits, Columbia University, (Spring 1996)

Mathematica for Calculus I and II - Recitations in Computer Lab, Department of Mathematics, 18–20 undergraduate students, 4.5 credits, Columbia University, (Fall 1994, Spring 1995)

Hyperbolic Geometry and Knot Theory, Undergraduate Seminar in Mathematics, 3 credits, Columbia University, (Fall 1993)

Representations of Finite Groups, Undergraduate Seminar in Mathematics , 3 credits, Columbia University, (Spring 1994)

Calculus I, Lecturer, Columbia College Opportunity Programs for Minorities, 15–20 undergrad. students, Columbia University (Summer 1993)

Calculus I and II, Lecturer, Algebra and Trigonometry, Complex Analysis, Introductory Mechanics, Mathematics Special Assistance Unit, Department of Mathematics, University of Melbourne (1989 –1991)

Resident Mathematics Tutor, Trinity College, University of Melbourne (1991)

English for Academic Purposes (Mathematics), Lecturer, Footscray College, Melbourne (1988)

PhD students

Coadviser to Abid Ali, Thesis *Congruence subgroups of lattices in rank 2 Kac–Moody groups over finite fields*, Quaid-i-Azam University, Islamabad, Pakistan (2011)

Leigh Cobbs, Thesis *Infinite descending chains of cocompact lattices in Kac–Moody groups*, Rutgers University, (2009)

MS students

Frank Wagner, Thesis *Uniqueness of representation–theoretic hyperbolic Kac–Moody groups over* $\mathbb{Z}$, Rutgers University, (2015)

Sowmya Srinivasan, Thesis *Commutation relations and structure constants for rank 2 Kac–Moody algebras*, Rutgers University, (2015)

Diego Penta, Thesis *Weyl group orbits on Kac–Moody root systems*, Rutgers University, (2010)

Independent research with graduate students

H. Chen, J. Du, D. Hou, D. Tan and F. Thurman *Monstrous Lie algebras as Borcherds algebras*, In preparation (2026)

T. Coelho, S. H. Murray, F. Thurman and S. Zhu *Growth of root multiplicities along imaginary root strings in Kac–Moody algebras*, To appear, Communications in Algebra (2025), arXiv:2403.01687v1 [math.RT]

Coulson, B., Kanade, S. and Murray, S. H. *Chevalley bases for Kac–Moody algebras: a computational approach*, Preprint, (2016)

Yusra Naqvi, *Hyperbolic Kac–Moody Weyl groups, billiard tables and and actions of lattices on trees*, Journal of Pure and Applied Algebra Vol 213 No. 3, 495–518 (2012)

Chung, S., Cobbs, L., McRae, R., Nandi, D., Naqvi Y. and Penta, D. *Classification of hyperbolic Dynkin diagrams, root lengths and Weyl group orbits*, Journal of Physics. A: Math. Theor. 43 155209, (2010)

Independent research with undergraduate students

Matt Kownacki, Rutgers University, *Commutation relations and structure constants for rank 2 Kac–Moody algebras*, Journal of Algebra, Volume 566, (2021), Pages 443–476 arXiv:1804.02308

Alex Conway, Rutgers University, *Weyl group orbits on Kac–Moody root systems*, J. Phys. A: Math. Theor. 47 445201, (2014) arXiv:1407.3375

Dennis Clark, Harvard University, *Lattices on Parabolic Trees*, Communications in Algebra, Vol. 30, Issue 4, 1853–1886 (2002)

Independent study projects

Independent study on 'Hopf algebras', Rutgers undergraduate students, (Fall 2024, Spring 2025)

Reading course on 'Graduate algebra', Rutgers graduate students, (Summer 2023, Spring 2024)

Reading course on 'Combinatorial group theory', Rutgers graduate students, Rutgers University, (2018)

Reading course on 'Chevalley groups', Rutgers graduate students, Rutgers University, (2018)

Adviser for FIGS course, Rutgers undergraduate students, Rutgers University, (2018)

Adviser to Undergraduate Research Assistant, Rutgers University (2016-2017)

Evaluation of Rutgers PhD students as teaching assistants, Rutgers University (Spring 2007, Spring 2008, Spring 2009)

Adviser to Undergraduate Research Assistant, Rutgers University (2004–2007)

Adviser to Undergraduate Research Assistants , through VIGRE, Harvard University (1999–2000, 2000–2001)

Intensive Undergraduate Advising, Harvard University (2000-2001)

Undergraduate Adviser, Advised 4 mathematics majors each year, Harvard University, (1999–2000, 2000–2001)

Refereeing Experience

Annals of Representation Theory, (2023)

PRIMS, (2023)

Communications in Mathematical Physics, (2022)

PRIMS, (2022)

Journal of the American Mathematical Society, (2021)

Transactions of the American Mathematical Society, (2021)

International Congress of Chinese Mathematicians, (2021)

Cambridge University Press, (2020)

International Centre for Mathematical Sciences, Edinburgh, reviewed conference proposal, (2018)

Science China, Mathematics, (2017)

Transactions of the AMS, (2016)

Reviewer for Austrian Science Fund, (2015)

Mathematical Proceedings, Cambridge Philosophical Society, (2015)

Proposal reviewer for the Kuwait Foundation for the Advancement of Sciences, (2015, 2016, 2017)

Mathematische Zeitschrift, (2014)

Journal of Mathematical Physics, (2013)

Compositio Mathematica, (2013)

Forum Mathematicum, (2012)

Journal of the European Math. Society, (2011)

PSC–CUNY Award Program, (2009, 2011)

Reviewer for PhD theses and faculty evaluation, Department of Mathematics, Quaid-i-Azam University, Islamabad, Pakistan (2011)

Research Team Proposals in Science and Technology, administrated by the Chilean National Commission for Science and Technology Research (CONICYT) (2009)

Acta Mathematica, (2009)

Journal of Number Theory, (2008)

Duke Math Journal, (2007)

Geometria Dedicata, (2006, 2007, 2010)

Memoirs of the American Mathematical Society, (2006)

Communications in Algebra, (2006)

NSF reviewer, (2001, 2002, 2003, 2004, 2005)

Math Reviews, (2002)

Journal of Pure and Applied Algebra, (2006, 2007)

European Journal of Combinatorics, (1997)

Inventiones Mathematicae, (1996)

Committees

Undergraduate committee, Rutgers University, (2015–2016, 2025–present)

Scheduling committee, Rutgers University, (2020-2021)

NSF Panel, January 2018

Program committee, Women and Mathematics program at IAS, sponsored by IAS, Princeton University and NSF (2014–2024)

Physical and Mathematical Sciences and Engineering Area Committee, Rutgers University, (2016–2018)

Chair, qualifying exam committee, Rutgers University (2014–2015)

Mathematics Department representative to Rutgers Faculty Council, (2013-2015)

Rutgers Strategic Planning Committee on Faculty Excellence, (2013)

Colloquium Committee, Rutgers University (2006–2013)

Advisory Committee on Appointment and Promotions, Rutgers University Mathematics and Physical Sciences, School of Arts and Sciences (2010–2012)

NSF Panel, January 2010

Rutgers Physical Sciences Area Committee, (2009–2011)

Rutgers GAANN steering committee, (2009–2011)

AMS Committee on Academic Freedom, Tenure and Employment Security, (2008–2011)

NSF Site visit to MSRI, Fall 2009

NSF Panel, October 2007

Library Committee, Rutgers University (2003–2006)

AMS Representative to 'Joint Committee on Women in the Mathematical Sciences' for AMS, MAA, AWM, NCTM, ASA, (2002–2005)

Qualifying exams, writing and grading, Harvard University (1999–2000, 2000–2001)

Graduate Admissions, Harvard University (1997–1998)

Workshops to assist in professional preparation of mathematicians

Organizer 'Finding your inner actor', Women and Mathematics program at IAS, (May 2015)

Seminar 'The language of mathematics', Women and Mathematics program at IAS, (August 2014)

Workshop 'The mathematician as an actor, Women and Mathematics program at IAS, (August 2014)

Organizer 'Effective and expressive communication workshop' for PhD students with Mason Gross acting coach, Rutgers University, (August 2011)

Outreach activities

Video for Google Gemini DeepThink, https://x.com/demishassabis/status/2022053598822379769, (February 2026)

'Female participation in STEM - recent studies', Rutgers University, (May 2023)

'Female participation in STEM - recent studies', Women and Science honors course, Rutgers University, (March 2019)

'The importance of critical thinking', Penola High School, Junior Campus, Melbourne, Australia (July 2019)

'The importance of critical thinking', Penola High School, Senior Campus, Melbourne, Australia (July 2019)

Careers panel 'Girl leadership summit', Princeton University, (2014)

'My Career as a Mathematician' speaker to local high school students, IHÉS, France, (June 2011)

IAS/Princeton Women and Mathematics program 'A day in the life', IAS (May 2007)

Speaker on VIGRE Panel 'Academic Job Hunting from the View of the Job- Hunter', Rutgers University, (Fall 2001)

PhD thesis committees

Terence Coelho, Rutgers University, (2025)

Songhao Zhu, Rutgers University, (2024)

Rudra Narayan Padhan, National Institute of Technology Rourkela, India (2020)

Saurabh Gosavi, Rutgers University, (2020)

S. Krishnaveni, University of Madras, (2019)

Bud Coulson, Rutgers University, Department of Mathematics (Spring 2016)

Brandon Bate, Rutgers University, Department of Mathematics (Spring 2013)

Hesameddin Abbaspour Tazehkand, University of British Columbia, Department of Mathematics (Fall 2012) a *Catherine Pfaff*, Rutgers University, Department of Mathematics (Fall 2011)

Robert Schabinger, Rutgers University, Department of Physics and Astronomy (Fall 2010)

Leigh Cobbs, Rutgers University, Department of Mathematics (Spring 2009)

Shahriar Mokhtari-Shargi, Columbia University, Department of Mathematics (Fall 1997)

Graduate oral qualifying exam committees

Carlos Tapp, Rutgers University, (2025)

Yuqiao Huang, Rutgers University, (2025)

Daniel Tan, Rutgers University, (2023)

Dennis Hou, Rutgers University, (2022)

Jishen Du, Rutgers University, (2022)

Hong Chen, Rutgers University, (2022)

Johnny Fonseca, Rutgers University, (2020)

Tamar Lichter, Rutgers University, (2020)

Songhao Zhu, Rutgers University, (2019)

Jason Saied, Rutgers University, (2018)

Fei Qi, Rutgers University, (2014)

Bud Coulson, Rutgers University, (2012)

Shashank Kanade, Rutgers University, (2011)

Francesco Fiordalisi, Rutgers University, (2010)

Chris Sadowski, Rutgers University, (2010)

Yusra Naqvi, Rutgers University, (2008)

Leigh Cobbs, Rutgers University, (2006)

Corina Calinescu, Rutgers University, (2005)

Consulting experience

Math for America, Standard setting for Newton Fellowship (September 2005)

Revlon Consumer Products Corporation, Patents division, New York, NY (1998–1999)

Professional Affiliations

Permanent Elected Member of DIMACS (Center for Discrete Mathematics and Theoretical Computer Science), a collaborative project of Rutgers University, Princeton University, AT&T Labs, Bell Labs, Telcordia Technologies, NEC (Founded as a NSF Science and Technology Center)

Member of the American Mathematical Society

Member of the Australian Mathematical Society

Related Employment

Educational Testing Service, (Writing GRE and GMAT tests)) Princeton, NJ (1995, 1996)

Research Assistant (Internet Resources for Mathematicians), Department of Mathematics, Columbia University (1993–1995)

Research Assistant (Educational Testing): Computer Assisted Diagnostic Testing, Australian Council for Educational Research, Large Group Teaching, Center for the Study of Higher Education at the University of Melbourne, (1988–1991)

Senior tutor, Trinity College, University of Melbourne, (Feb–Aug 1991)

Corporate Business Superannuation Fund Administrator, National Mutual Life Association of Australia, (Jan–Aug 1988)