Roya Beheshti Zavareh

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Research Interests

Algebraic geometer specializing in moudli spaces of rational curves on varieties, Fano varieties, and the geometry of hypersurfaces

Academic Appointments

2023–present	Professor, Washington University in St. Louis
2013–2023	Associate Professor, Washington University in St. Louis
2007–2013	Assistant Professor, Washington University in St. Louis
2006–2007	Postdoctoral Fellow, Mathematical Sciences Research Institute (MSRI)
2004–2006	Postdoctoral Fellow, Queen's University, Canada
2003–2004	Postdoctoral Fellow, Max Planck Institute for Mathematics, Germany

Visiting Positions

2011-2012	Visiting Assistant Professor, Columbia University
Spring 2009	Visiting Scholar, MSRI, Berkeley
April-May, 2026	Visiting Scholar, Mittag Leffler Institute, Sweden

Education

2003	**Ph.D. in Mathematics**, Massachusetts Institute of Technology Dissertation: *Lines on Fano hypersurfaces*. Advisor: Johan de Jong.
1999	**B.S. in Mathematics**, Sharif University of Technology, Iran

Awards

1995	**Bronze Medal**, International Olympiad in Informatics, Netherlands
1994	**Silver Medal**, International Mathematical Olympiad, Hong Kong

Selected Research Funding

2024–2029	**Simons Collaboration Grant for Mathematicians**
2021–2025	**NSF DMS-2101935**, Principal Investigator; **$203,917**
2016–2020	NSF, I-70 Algebraic Geometry Symposia, Co-Principal Investigator
2015–2020	Simons Collaboration Grant for Mathematicians
2012–2017	**NSF DMS-1204567**, Principal Investigator
2011–2012	Simons Collaboration Grant for Mathematicians

Pending proposal: NSF individual research grant, 2026.

Recent Publications and Preprints

Preprints

1. Higher-order tangent lines to smooth hypersurfaces
With S. Mukhopadhyay.
Submitted, 2026. arXiv:2610.28558.

2. On the classification of toric 2-Fano manifolds: generic $\mathbb{P}^2$-bundles
With C. Araujo, A.-M. Castravet, K. Jabbusch, S. Makarova, E. Mazzon, and N. Viswanathan.
Submitted, 2026. arXiv:2604.18054.

3. Picard rank bounds for toric Fano manifolds
With C. Araujo, C. Casagrande, A.-M. Castravet, K. Jabbusch, S. Makarova, and E. Mazzon.
Preprint, 2026.

4. Notes on residues and zero cycles on algebraic varieties
With Ravindra Girivaru.
Preprint, 2026.

Recently Published and Forthcoming Articles

5. Separable rational connectedness and k-plane sections of hypersurfaces
With S. Mukhopadhyay and E. Riedl.
Under review at the Journal of the London Mathematical Society (2026). arXiv:2512.15903.

6. On the asymptotic enumerativity property for Fano manifolds
With B. Lehmann, C. Lian, E. Riedl, J. Starr, and S. Tanimoto.
*Forum of Mathematics, Sigma **12** (2024), e112.*

7. The minimal projective bundle dimension and toric 2-Fano manifolds
With C. Araujo, A.-M. Castravet, K. Jabbusch, S. Makarova, E. Mazzon, and N. Viswanathan; appendix by W. Reynolds.
*Transactions of the American Mathematical Society **377** (2024), 7229–7258.*

8. Bounds on the Picard rank of toric Fano varieties with minimal curve constraints
With B. Wormleighton.
*Proceedings of the American Mathematical Society **151** (2023), 1503–1518.*

9. Rational curves on del Pezzo surfaces in positive characteristic
With B. Lehmann, E. Riedl, and S. Tanimoto.
*Transactions of the American Mathematical Society, Series B **10** (2023), 407–451.*

10. Moduli spaces of rational curves on Fano threefolds
With B. Lehmann, E. Riedl, and S. Tanimoto.
*Advances in Mathematics **408** (2022), 108557, 60 pp.*

11. Restrictions on rational surfaces lying in very general hypersurfaces
With E. Riedl.
*Forum of Mathematics, Sigma **10** (2022), e71, 11 pp.*

12. Higher Fano manifolds
With C. Araujo, A.-M. Castravet, K. Jabbusch, S. Makarova, E. Mazzon, L. Taylor, and N. Viswanathan.
*Revista de la Unión Matemática Argentina **64** (2022), no. 1, 103–125.*

13. Linear subspaces of hypersurfaces
With E. Riedl.
*Duke Mathematical Journal **170** (2021), no. 10, 2263–2288.*

Selected Earlier Publications

14. Positivity results for spaces of rational curves
With E. Riedl.
*Algebra & Number Theory **14** (2020), no. 2, 485–500.*

15. Hypersurfaces with too many rational curves
Sole author.

Mathematische Annalen ***360*** *(2014), nos. 3–4, 753–768.*

16. Spaces of rational curves on complete intersections
With N. Mohan Kumar.
Compositio Mathematica ***149*** *(2013), 1041–1060.*

17. Fibers of generic projections
With D. Eisenbud.
Compositio Mathematica ***146*** *(2010), no. 2, 435–456.*

18. Rational surfaces in index-one Fano hypersurfaces
With J. Starr.
Journal of Algebraic Geometry ***17*** *(2008), no. 2, 255–274.*

19. Lines on projective hypersurfaces
Sole author.
Journal für die reine und angewandte Mathematik ***592*** *(2006), 1–21.*

Book

Elementary Number Theory: Challenging Problems, with Maryam Mirzakhani. Fatemi Publishers, 1999. In Persian.

Funded Research Collaborations

- **Collaborate@ICERM**, June 2026. Noether–Lefschetz theory in higher codimensions; with D. Raychaudhury, A. Dhillon, A. F. Lopez, G. V. Ravindra, and A. Tripathi.
- **Collaborate@ICERM**, August 2024. Counting sections of Fano fibrations; with B. Lehmann, E. Riedl, and S. Tanimoto.
- **SLMath Summer Research in Mathematics**, July 2024. Higher Fano toric varieties; with C. Araujo, A.-M. Castravet, K. Jabbusch, S. Makarova, E. Mazzon, and N. Viswanathan.
- **AIM SQuaREs**, 2019, 2020, 2023. Geometric Manin's conjecture in characteristic p; with B. Lehmann, E. Riedl, and S. Tanimoto.

Scientific Leadership and Editorial Service

2022–present	**Scientific Research Board**, American Institute of Mathematics
2024–present	**Editorial Board**, Mathematische Zeitschrift
2022–present	**Editorial Board**, Communications in Algebra
2021–2026	Organizing Council, Western Algebraic Geometry Symposium
2024	**Chair**, Hiring Committee, Washington University in St. Louis
2021	**Co-chair**, Hiring Committee, Washington University in St. Louis
2020	Research Group Co-leader, Women in Algebraic Geometry, ICERM
2016–2018	**Chair**, AMS Committee on the Human Rights of Mathematicians
2016–2018	Advisory Board, Washington University Prison Education Project
2016–2018	Divisional Member, Washington University Faculty Senate Council

NSF review panels: 2012–2013, 2014–2015, 2018–2019; service on the NSF Postdoctoral Research Fellowships panel.

Selected Recent Invited Talks

- Vector Bundles on Algebraic Curves Conference (VBAC), ICTP, Italy, May 2027 (upcoming).
- Western Algebraic Geometry Symposium (WAGS), University of Utah, December 2026 (upcoming).
- Johns Hopkins University, Algebraic Geometry Seminar, November 2024.

- Workshop on Tevelev Degrees and Related Topics, UIUC, October 2024.
- Northwestern University, Algebraic Geometry Seminar, November 2023.
- University of Washington–PIMS Colloquium, Seattle, April 2023.
- University of Utah, Algebraic Geometry Seminar, February 2023.
- *Birational Complexity of Algebraic Varieties*, Simons Center, December 2022.
- *Rationality, Moduli Spaces, and Related Topics*, Nagoya University, November 2022.
- *Algebraic Geometry and Algebraic K-Theory: A Conference in Honor of Mohan Kumar*, St. Louis, May 2022.
- University of Chicago, Algebraic Geometry Seminar, April 2021.
- Princeton University, Algebraic Geometry Seminar, March 2021.
- Columbia University, Algebraic Geometry Seminar, November 2020.
- University of Pittsburgh, Colloquium, January 2020.

Selected Conference and Program Organization

Co-organizer of the following conferences, programs, and special sessions:

- Workshop on Curves on Varieties via Geometry and Arithmetic, EPFL, Switzerland, Spring 2027 (upcoming).
- Western Algebraic Geometry Symposium, Washington University, Fall 2023.
- Thematic Program on Rationality and Hyperbolicity, University of Notre Dame, June 2023.
- Algebraic Geometry and Algebraic K-Theory: A Conference in Honor of Mohan Kumar, May 2022.
- I-70 Algebraic Geometry Symposia, 2016–2020; joint series with the University of Missouri–St. Louis, University of Missouri–Columbia, and University of Kansas.
- AMS Special Session on Algebraic Geometry, Washington University, October 2013.
- AMS Special Session on Algebraic Geometry, Georgia Southern University, March 2011.
- Show-Me Algebraic Geometry Workshop, 2007–2009; joint series with the University of Missouri–St. Louis and University of Missouri–Columbia.