Curriculum Vitae

Personal Data

- Name : Stanley Yao Xiao
- Citizenship : Canadian
- Languages : English, Mandarin, Cantonese, Chinese (written)
- Email : StanleyYao.Xiao@unbc.ca

Employment

- Assistant Professor, Department of Mathematics and Statistics, **University of Northern British** Columbia (2021-present)
- Postdoctoral Fellow, Department of Mathematics, University of Toronto (2018-2021).
- Research Fellow and NSERC Post-Doctral Fellow, Mathematical Institute, **University of Oxford** (2016 2018).

Education

• PhD in Pure Mathematics. University of Waterloo. (2011 - 2016)

Advisor: Professor Cameron L. Stewart

Doctoral Thesis: Some results on binary forms and counting rational points on algebraic varieties

• Master of Mathematics. Pure Mathematics (Thesis based). University of Waterloo. (2010 - 2011)

Advisor: Professor Cameron L. Stewart

Masters Thesis: On the Erdős-Turán conjecture and related results.

• (2004 - 2009) University of British Columbia, Honours Bachelors of Science in Mathematics.

Publications

Published or Accepted

 2025 Heights and quantitative arithmetic on stacky curves, joint work with B. Nasserden, Canadian Journal of Mathematics. (2) 77 (2025), 481–534. DOI: 10.4153/S0008414X24000075

- 2024 Prime values of $f(a, b^2)$ and $f(a, p^2)$, f quadratic, Algebra and Number Theory, (9) 18 (2024), 1619-1679. DOI: 10.2140/ant.2024.18.1619
- 2024 Density of power-free values of polynomials, II, with Kostadinka Lapkova, Journal of Number Theory **265** (2024), 20-35. DOI: 10.1016/j.jnt.2024.06.010
- 2024 Elliptic curves with a rational 2-torsion point ordered by conductor and the boundedness of average rank, Advances in Mathematics **446** (2024), 109681. DOI: 10.1016/j.aim.2024.109681
- 2022 On monic abelian cubics, Compositio Mathematica (3) 158 (2022), 550-567. DOI: 10.1112/S0010437X22007369
- 2021 On the representation of k-free integers by binary forms, joint work with C. L. Stewart, Revista Matematica Iberoamericana (2) **37** (2021), 723-748. DOI: 10.4171/rmi/1213
- 2021 The number of quartic D₄-fields with monogenic cubic resolvent ordered by conductor, joint work with C. Tsang, Transactions of the American Mathematical Society (3) **374** (2021), 1987-2033. DOI: 10.1090/tran/8260
- 2020 On prime values of binary quadratic forms with a thin variable, joint work with P. C. H. Lam and D. Schindler, Journal of the London Mathematical Society (2) **102** (2020), 749-772. DOI: 10.1112/jlms.12336
- 2020 Zeroes of polynomials with prime inputs and Schmidt's h-invariant, joint work with S. Yamagishi, Canadian Journal of Mathematics (3) 72 (2020), 805-833. DOI: 10.4153/S0008414X19000026
- 2019 On binary quartic forms with bounded invariants and small Galois groups, joint work with Cindy Tsang, Pacific Journal of Mathematics (1) **302** (2019), 249-291. DOI: 10.2140/pjm.2019.302.249
- 2019 On binary cubic and quartic forms, Journal de Théorie des Nombres de Bordeaux, (2) 31 (2019), 323-341. DOI: 10.5802/jtnb.1083
- 2019 On the representation of integers by binary forms, with C. L. Stewart, Mathematische Annalen **375** (2019), 133-163. DOI: 10.1007/s00208-019-01855-y
- 2019 Density of power-free values of polynomials, with K. Lapkova, Mathematika 65 (2019), 1038-1050. DOI: 10.1112/S0025579319000275
- 2018 Square-free values of decomposable forms, Canadian Journal of Mathematics 70 (2018), 1390-1415. DOI: 10.4153/CJM-2017-060-4
- 2017 Power-free values of binary forms and the global determinant method, International Mathematics Research Notices, **16** Volume 2017, 5078-5135. DOI: 10.1093/imrn/rnw165

Submitted

- 2025 Hilbert's tenth problem for systems of diagonal quadratic forms, and Büchi's problem, submitted to Annals of Mathematics.
- 2025 On the number of binary quadratic forms having discriminant 1 − 4p, p prime, with Alison Beth Miller, submitted to Quarterly Journal of Mathematics, arXiv:2011.06559 [math.NT].
- 2024 Exponential sums over singular binary quartic forms and applications, with Yasuhiro Ishitsuka, Takashi Taniguchi, and Frank Thorne, submitted to American Journal of Mathematics, arXiv:2404.00541 [math.NT].
- 2024 Sextic polynomials in two variables do not represent all non-negative integers, submitted to International Mathematics Research Notices, arXiv:2310.20021 [math.NT].
- 2023 Quartic polynomials in two variables do not represent all non-negative integers, with Shuntaro Yamagishi, under revision at Journal of the European Mathematical Society, arXiv:2307.05712 [math.NT].

Grants, Awards and Scholarships

- (2024) NSERC Discovery Grant, 5 years (2024-2029), \$30,000 CAD per year.
- (2017) Murray Martin Prize (for Best Research Paper by a Mathematics Faculty Graduate Student, University of Waterloo)
- (2016-2018) NSERC Post-Doctoral Fellowship.
- (2014) Winner of the Mathematics Faculty Heat for the Three Minute Thesis Competition.
- (2013-2016) Ontario Graduate Scholarship.

Invited Talks

- Carleton University Number Theory Seminar. March 2025.
- Hilbert's tenth problem and a conjecture of Büchi. Number Theory and Algebraic Geometry Seminar. Simon Fraser University. April 2024.
- Counting elliptic curves with a rational 2-torsion point ordered by conductor. Southern California Number Theory Day. UC Irvine. September 2022.
- Prime values of $f(a, b^2)$ and $f(a, p^2)$, f quadratic. Modern Break Throughs in Diophantine Problems. Banff International Research Station. June 2022.
- A primer on prime number theory. Inter-disciplinary Weekly Seminar Series. University of Northern British Columbia. October 2021.
- On monic abelian cubics. Special Session on Analytic Number Theory. AMS Eastern Sectional Meeting. October 2020.
- On the representation of integers by binary forms. Quebec and Vermont Number Theory Seminar. September 2020.
- On monic abelian cubics. Number and Representation Theory Seminar. University of Toronto. September 2020.
- Density of power-free values of polynomials. Number Theory Seminar. University of Waterloo. February 2020.
- Density of power-free values of polynomials. Number Theory and Representation Theory Seminar. University of Toronto. February 2020.
- On monic abelian cubics. Number Theory Seminar. Graz University of Technology. April 2019.
- Binary quartic forms with vanishing *J*-invariant. Special Session on Arithmetic Statistics at the Joint Mathematics Meetings. January 2019.
- On prime values of binary quadratic forms with a thin variable. Number Theory and Representation Theory Seminar. University of Toronto. September 2018.
- Quartic orders of D_4 -type with monogenic cubic resolvent. Number Theory Seminar. University of Warwick. November 2017.
- On the representation of k-free integers by binary forms. Number Theory Seminar. Graz University of Technology. October 2017.
- Two parametrizations of binary quartic forms with small Galois group. Number Theory Seminar. Queen's University. July 2017.

- On binary quartic forms with small Galois group. Kobe Number Theory Workshop 2017. June 2017.
- Representation of integers by binary forms. University of Utrecht. November 2016.
- Representation of integers by binary forms. Number Theory Seminar. University of Manchester. November 2016.
- On binary cubic and quartic forms. Heilbronn Seminar. University of Bristol. November 2016.
- Representation of integers by binary forms. Number Theory Seminar. University of Oxford. October 2016.

Service and other activities

MathOverflow

On 28 May 2025, I was elected as a Moderator on MathOverflow.

Service as a Referee

I have refereed papers for the following journals:

Duke Mathematical Journal Advances in Mathematics Journal of the European Mathematical Society Proceedings of the London Mathematical Society Algebra and Number Theory Transactions of the American Mathematical Society Forum of Mathematics: Sigma International Mathematics Research Notices Journal of the London Mathematical Society Research in Number Theory Bulletin of the London Mathematical Society Journal de Théorie des Nombres de Bordeaux Journal of Number Theory

I have performed the following service activities:

- (2024) Organizer of Computational and Arithmetic Geometry Session Canadian Mathematical Society Winter Meeting.
- (2022-Present) Organizer of the Interdisciplinary Weekly Seminar Series University of Northern British Columbia.
- (2020) Organizer of Number and Representation Theory Seminar University of Toronto.
- (2019) Organizer of Analytic Number Theory Session Canadian Mathematical Society Winter Meeting.
- (2017 Present) Reviewer for Mathematical Reviews, American Mathematical Society.
- (2017 2018) Member of the Early Career Researcher Committee, Mathematical Institute, University of Oxford.

Teaching

- Winter 2024 Math 481 Analytic Number Theory. University of Northern British Columbia.
- Winter 2024 Math 326 Advanced Linear Algebra. University of Northern British Columbia.
- Fall 2023 Math 320 Survey of Algebra. University of Northern British Columbia.
- Fall 2023 Math 202 Calculus II. University of Northern British Columbia.
- Winter 2023 Math 224 Foundations of Modern Mathematics. University of Northern British Columbia.
- Winter 2023 Math 326 Advanced Linear Algebra. University of Northern British Columbia.
- Fall 2023 Math 480 Number Theory. University of Northern British Columbia.
- Winter 2022 Math 224 Foundations of Modern Mathematics. University of Northern British Columbia.
- Fall 2021 MATH 100 Calculus I. University of Northern British Columbia.
- Winter 2021 MAT302 Introduction to Algebraic Cryptography. University of Toronto Mississauga.
- Fall 2020 MAT 334 Complex Variables. University of Toronto.
- Summer 2020 MAT 224 Linear Algebra II for Faculty of Arts and Science. University of Toronto.
- Winter 2020 MAT 136 Calculus II Integral Calculus. University of Toronto at Mississauga.
- Fall 2019 MAT223 Linear Algebra I for Faculty of Arts and Science. University of Toronto.
- Winter 2019 MAT202 Introduction to Discrete Mathematics. University of Toronto at Mississauga.
- Fall 2018 MAT188 Linear Algebra for Enginners. University of Toronto.
- Michaelmas 2017 Counting Binary Forms An Introduction to the Methods of Manjul Bhargava. University of Oxford.