

- 2022–        **NSF postdoc**, *University of Utah*, Salt Lake City, UT, USA  
2021–2022 **Wylie Assistant Professor**, *University of Utah*, Salt Lake City, UT, USA

## Education

- 2015–2021 **Ph.D. in Mathematics**, *University of Michigan*, Ann Arbor, MI, USA
- Advised by Prof. Karen Smith.
  - 10/2018–12/2019 Extramural study at the University of Tokyo, Japan, advised by Prof. Shunsuke Takagi.
- 2011–2015 **B. Sc. in Mathematics**, *Univeristy of Glasgow*, Glasgow, Scotland
- With Honours of the First Class.
  - 08/2012–05/2013 Study abroad at the National University of Singapore.

## Preprints and Publications

- 2025 Plus-pure thresholds of some cusp-like singularities in mixed characteristic.
  - With H. Cai, S. Pande, K. Schwede, and K. Tucker.
  - arXiv:2501.07528.
- 2024 Bernstein-Sato theory modulo  $p^m$ .
  - With T. Bitoun.
  - arXiv:2401.07082.
- 2024 Flat morphisms with regular fibers do not preserve  $F$ -rationality.
  - With A. Simpson and A. Singh.
  - Rev. Mat. Iberoam.
- 2024 A formalism of  $F$ -modules for rings with complete local FFRT.
  - International Mathematics Research Notices.
- 2023 Bernstein-Sato theory for singular rings in positive characteristic.
  - With J. Jeffries and L. Núñez-Betancourt.
  - Transactions of the American Mathematical Society.
- 2021 Symmetry on rings of differential operators.
  - Journal of Algebra.
- 2020 Bernstein-Sato theory for arbitrary ideals in positive characteristic.
  - Transactions of the American Mathematical Society.
- 2020 Bernstein-Sato roots for monomial ideals in positive characteristic.
  - Nagoya Mathematical Journal.

## Scholarships and Awards

- 2024 Summer Collaborators Program, Institute for Advanced Study.
  - Invites a group of collaborators to IAS for 2-3 weeks during the summer.

- 2023 Tucker Award, University of Utah.
  - Recognizes exceptional research by a postdoc in the Mathematics Department.
- 2022–2025 NSF: Mathematical Sciences Postdoctoral Research Fellowship.
- 2018 Ito Foundation for International Education Exchange Scholarship.
  - Provides funding for up to two years of study in Japan.
- 2015 Third Prize at the International Mathematics Competition for University Students.
- 2014 Ede and Ravenscroft Prize, University of Glasgow.
  - Awarded annually to the most distinguished Science graduate of the year.
- 2013 Cunninghame Medal and Prize, University of Glasgow.
  - Awarded annually to the most distinguished student in the Advanced Honours class of Mathematics at the University of Glasgow.
- 2011 Honorable Mention at the International Physics Olympiad.
- 2010 Gold Medal at the Spanish Physics Olympiad.

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## Service

- 2024 Co-organized the Commutative Algebra Seminar at the University of Utah.
- 2023 Co-organized a hybrid seminar on simplicial commutative algebra.
- 2023 Organized a hybrid seminar on derived rings of differential operators.
- 2022 Organized a reading seminar on the Bhatt and Lurie’s Riemann-Hilbert correspondence in positive characteristic.
- 2020, 2021 Co-organized the online Differential Operators in Commutative Algebra Seminar (DOCAS): <https://sites.google.com/umich.edu/docas>

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## Invited Talks

- 2024 AMS Sectional Meeting, Albany, NY.
  - Special Session on Singularities in Commutative Algebra.
- 2024 Institute of Mathematics - Johannes Gutenberg-Universität Mainz.
- 2024 Seminari de Geometria Algebraica de Barcelona.
- 2024 Algebra Seminar, Basque Center for Applied Mathematics.
- 2024 Algebra Seminar, Universidad de Sevilla.
- 2024 SLMATH, Seminar Series on FFRT.
- 2023 University of Illinois at Chicago, Algebraic Geometry Seminar.
- 2023 AMS Sectional Meeting, Omaha, NE, USA.
  - Special Session on Commutative Algebra, Differential Operators, and Singularities.
- 2023 BCAM, Bilbao, Spain.
  - Meeting of the Spanish Network for Algebraic Geometry and Singularity Theory.
- 2022 Commutative Algebra Seminar at University of Minnesota.
- 2021 Mathematical Congress of the Americas.
  - Session: Differential Operators in Algebraic Geometry and Commutative Algebra.
- 2021 Singularity Seminar of Nihon University.
- 2021 Commutative Algebra Seminar at University of Illinois at Chicago.

- 2021 Joint Mathematics Meetings.
  - Special Session on Commutative Algebra in Positive Characteristic.
- 2020 Commutative Algebra Seminar at Purdue University.
- 2020 University of Arkansas Algebra Seminar.
- 2019 41<sup>st</sup> Japan Symposium on Commutative Algebra.
- 2019 Commutative Algebra and Algebraic Geometry Seminar, CIMAT.
- 2019 AMS Sectional Meeting, Madison, WI, USA
  - Special Session on Homological and Char.  $p > 0$  Methods in Commutative Algebra.
- 2019 Algebra Seminar, Universidad Autónoma de Madrid.
- 2019 RIMS x OIST Joint Workshop: “On the problem of resolution of singularities and its vicinity”, Okinawa, Japan.
- 2018 Singularity Seminar of Nihon University

## Teaching

As instructor of record:

*University of Utah*

- F2024 MATH3160 Applied Complex Variables.
- F2023 MATH1220 Calculus II.
- W2022 MATH3160 Applied Complex Variables.
- F2021 MATH1220 Calculus II.

*University of Michigan*

- F2020 MATH116 Calculus II.
- W2020 MATH116 Calculus II.
- W2017 MATH115 Calculus I.
- F2016 MATH105 Precalculus.

Other teaching experiences:

- 10/2024 Methods in Mixed Characteristic Geometry.
  - Johannes Gutenberg-Universität, Mainz, Germany.
  - Teaching assistant.
- 2024-2025 Supervision of senior thesis.
  - Abel Doñate Muñoz.
  - *Strength of Bernstein-Sato roots of cusp singularities*. (Preliminary title).
- 01/2024 RGAS School on Singularities.
  - Instructor for the course “Test ideals and  $b$ -functions in positive characteristic.”
  - School that brings together early career mathematicians and experts in singularities.
- 07/2023 PRAGMATIC.
  - University of Catania, Italy.
  - Teaching assistant.
  - One week of lectures and two weeks of problem solving for stimulating research in algebraic geometry and commutative algebra among young people.

- 06/2023 SLMATH CMND Summer School on Commutative Algebra.
  - University of Notre Dame, Indiana.
  - Teaching assistant for Differential Operators mini-course.
  - Two-week summer school on some topics in commutative algebra, covered across three mini-courses and problem sessions.
- 2022-2023 Supervision of senior thesis.
  - Pedro López Sancha.
  - *Bernstein-Sato theory for determinantal ideals in positive characteristic.*
  - Emmy Noether prize from Societat Catalana de Matemàtiques.
- 06/2022 Summer High School Program.
  - University of Utah.
  - Director.
  - An intensive three-week program for motivated high school students.
- 08/2018 Course on Rings of Differential Operators.
  - University of Michigan.
  - A one-week introductory course on rings of differential operators aimed at graduate students and advanced undergrads.
- 07/2018 Michigan Math and Science Scholars, Fibonacci Numbers.
  - University of Michigan
  - Graduate Student Instructor under Prof. Melvin Hochster.
  - A two-week intensive course to introduce highly motivated high-school students to number theory, combinatorics and game theory via the study of Fibonacci numbers.
- 07/2017 Michigan Math and Science Scholars, Fibonacci Numbers.

## Languages

- English — Native level.
- Spanish — Mother tongue.
- Japanese — Basic level.