Charlie Godfrey

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Education

PhD in Mathematics, The University of Washington-Seattle June 2021 (expected)

- Adviser: Sándor Kovács
- Thesis: *Higher direct images of ideal sheaves, correspondences in log Hodge cohomology and globally F-full varieties*
  - Subject area: algebraic geometry (singularities, birational geometry, Hodge theory, Frobenius methods in positive characteristic)
  - Technical tools: category theory, homological and commutative algebra, duality, linear algebra
- Completed the eScience Institute's Advanced Graduate Data Science Option
  - PhD-level courses in machine learning, statistical inference and data visualization
  - Participated in the interdisciplinary weekly eScience seminar
- Department of Mathematics Graduate Fellowship 2018-2019

Student, MSRI Mathematics of Machine Learning Summer Graduate School July 29-August 9 2019

- Attended mini-courses and problem sessions on statistical learning, convex optimization, bandits, deep learning and reinforcement learning
- Presented an expository account of recent work on linear stochastic bandits

Master's of Science in Mathematics, The University of Washington-Seattle June 2018

- General exam paper: *Thrifty rational resolutions in arbitrary characteristic*

Bachelor's of Science in Mathematics and Physics, The University of Wisconsin-Madison May 2014

Research positions

Program Associate, Mathematical Sciences Research Institute March-May 2019

- Participated in the *Birational Geometry and Moduli Spaces* research program

Publications and preprints

[1] 2021a (with Takumi Murayama). "Du Bois Singularities in Families". In: *In preparation*.

[2] May 2021. "Higher Direct Images of Ideal Sheaves, Correspondences in Log Hodge Cohomology and Globally F-Full Varieties". PhD thesis. University of Washington. 66 pp. URL: math.washington.edu/~cgodfrey/assets/pdfs/thesis.pdf.

[4] Apr. 17, 2018. "Thrifty Rational Resolutions in Arbitrary Characteristic". General exam paper. URL: math.washington.edu/~cgodfrey/assets/pdfs/ThriftyRatl.pdf.

Talks

[2] Apr. 7, 2021. "A Du Bois-Jarraud Type Lemma in Characteristic p" (University of Washington "What are you working on?" Student Seminar).

[3] Jan. 5, 2021. "The (Derived) Direct Summand Conjecture: A Survey of Bhatt's Theorems" (University of Washington Recent Hits in Algebraic Geometry Student Seminar).
[4] Oct. 3, 2020 (with Takumi Murayama). "Du Bois Singularities in Families" (AMS Fall Eastern Sectional Special Session on Algebraic Singularities in Arbitrary Characteristic).
[5] Oct. 27, 2020. "Higher Direct Images of (Log) Structure Sheaves" (University of Washington Algebra and Algebraic Geometry Seminar).
[6] Apr. 26, 2019. "Logarithmic Chow-to-Hodge Cycle Maps" (Mathematical Sciences Research Institute Graduate Student Seminar).
[7] Aug. 9, 2019 (with Kapila Kottegoda, Oliver Knitter, and Yunpeng Shi). "Survey of Linear Stochastic Bandits" (MSRI Mathematics of Machine Learning Summer School).
[8] Aut. 2018. "The Cohomology of a Smooth Hypersurface" (The University of Washington Graduate Student 1, 2, 3 Seminar).
[9] Win. 2017. "The Cone of Curves" (The University of Washington Graduate Student MMP Seminar).

Teaching

Pre-doctoral Teaching Assistant, The University of Washington-Seattle September 2014-present

- *Main instructor*: Introduction to Differential Equations, Calculus I, Calculus III, Algebra with Applications, Introduction to Mathematical Reasoning, Graduate Prelim Exam Practice Course
- *Teaching assistant*: Pre-Calculus, Calculus I-III, Linear Algebra
- *Grader:* Graduate Abstract Algebra
- *Direct supervisor*: Andrew Loveless

Graduate Mentor, Washington Experimental Math Laboratory January 2019-December 2020

- Mentored a undergraduate research projects on topics such as the foundations of quantum mechanics, mathematical epidemiology and generalizations of the Gauss-Lucas theorem
  - Led tutorials on Python and Jupyter Notebooks
  - Met weekly with students to answer questions about papers or experimental results, suggest follow up questions and troubleshoot code
- *Faculty Mentors*: Jarod Alper, Benjamin Feintzeig, Harry Richman

Other research experience

Research experience for undergraduates Summer 2013
The University of Minnesota School of Physics and Astronomy

- Designed and performed experiments using the BL21Rosetta2 strain of *E. coli* in the context of synthetic biology. Used MATLAB for to solve differential equations modelling genetic circuits
- Principal Investigator: Vincent Noireaux