

Benjamin V. Church

PHD CANDIDATE, MATHEMATICS, STANFORD UNIVERSITY

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EDUCATION

Stanford University

Ph.D. in Mathematics
Advisor: Ravi Vakil

2021 - Present

Columbia University

B.A. in Mathematics and Physics with Honors, Summa Cum Laude
GPA: 4.13 (Overall)

2016 - 2020

RESEARCH INTERESTS

Algebraic geometry with a focus on birational geometry, arithmetic geometry, and geometry in positive characteristic.

PREPRINTS

Benjamin Church. "Nowhere vanishing 1-forms on 4-folds ." arXiv preprint <https://arxiv.org/abs/2504.19006> (2025).

Benjamin Church and Francisco García-Cortéz. " \mathbf{SL}_2 -character varieties of 2-generated groups and failure of weak integrality." arXiv preprint <https://arxiv.org/abs/2410.23233> (2024).

Benjamin Church. "Nowhere vanishing 1-forms on varieties admitting a good minimal model." arXiv preprint <https://arxiv.org/abs/2410.22753> (2024).

Chen, Nathan, **Benjamin Church**, and Junyan Zhao. "Curves on complete intersections and measures of irrationality." arXiv preprint <https://arxiv.org/abs/2406.12101> (2024).

Chen, Nathan, **Benjamin Church**, Lena Ji, and David Stapleton. "The fibering genus of Fano hypersurfaces." arXiv preprint <https://arxiv.org/abs/2308.12401> (2023).

Chen, Nathan, **Benjamin Church**, and Feng Hao. "Nowhere vanishing holomorphic one-forms and fibrations over abelian varieties." arXiv preprint <https://arxiv.org/abs/2306.15064> (2023).

PUBLICATIONS

Church, B. V., Mocz, P., & Ostriker, J. P. (2019). Heating of milky way disc stars by dark matter fluctuations in cold dark matter and fuzzy dark matter paradigms. Monthly Notices of the Royal Astronomical Society, 485(2), 2861–2876. <https://doi.org/10.1093/mnras/stz534>

Church, B. V., Williams, H. T., & Mar, J. C. (2019). Investigating skewness to understand gene expression heterogeneity in large patient cohorts. BMC Bioinformatics, 20(S24). <https://doi.org/10.1186/s12859-019-3252-0>

INVITED TALKS

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PRESENTATIONS

Algebraic Geometry Seminar: "1-forms on varieties admitting a good minimal model." University of Utah Spring 2025

Algebraic Geometry Seminar: "Curves on complete intersections and measures of irrationality." IMPA Spring 2025

Visiting Scholar
IMPA

Spring 2025

Algebraic Geometry Seminar: “Curves on complete intersections and measures of irrationality.”

University of Pennsylvania

Spring 2025

Algebraic Geometry Seminar: “1-forms on varieties admitting a good minimal model.”

Boston College

Fall 2024

Algebraic Geometry Seminar: “1-forms on varieties admitting a good minimal model.”

University of Maryland, College Park

Fall 2024

AGNES poster: “The fibering genus of Fano hypersurfaces”

Dartmouth University

Fall 2024

AGNES short talk: “1-forms on varieties admitting a good minimal model.”

Dartmouth University

Fall 2024

Algebraic Geometry Seminar: “Curves on complete intersections and measures of irrationality.”

Stony Brook University

Fall 2024

Harvard-MIT Algebraic Geometry Seminar: “Curves on complete intersections and measures of irrationality.”

Harvard University

Fall 2024

Birational Geometry Seminar: “Curves on complete intersections and measures of irrationality.”

UCLA

Summer 2024

GAeL XXXI: “Curves on complete intersections and measures of irrationality.”

Politecnico di Torino

Summer 2024

Algebraic geometry seminar: “Obstructions to unirationality in characteristic p.”

University of Toronto

Spring 2024

Higher Dimensional Algebraic Geometry, poster “The fibering genus of Fano hypersurfaces”

UCSD

Winter 2024

Algebraic geometry seminar: “Frames of 1-forms on varieties and maps to abelian varieties.”

Stanford University

Spring 2023

AWARDS

Jane Street Graduate Research Fellowship finalist

2025

NSF Graduate Research Fellowship

2023

John Dash van Buren, Jr. Prize in Mathematics, Columbia University

2020

Departmental Honors – Mathematics, Physics, Columbia University

2020

Phi Beta Kappa Junior Inductee

2019

MIT Battlecode AI Competition Finalist

2017

Science Research Fellow – Columbia University

2016 - 2020

TEACHING

Graduate Teaching Assistant: MATH145 Algebraic Geometry

Stanford University

Instructor: Prof. Hunter Spink

Spring 2022

Taught students in office hours and graded problem sets.

**Graduate Teaching Assistant: MATH56 Proofs and Modern Mathematics
Stanford University**

Instructor: Prof. András Vasy

Autumn 2021

Taught students in office hours and graded problem sets.

Counselor at Ross Mathematics Program

Instructor: Prof. Daniel Shapiro

Summer 2020

Guided students through number theory coursework and graded assignments.

Teaching Assistant: Accelerated Physics

Columbia University

Instructor: Prof. Brian Cole

2017 - 2018 and 2018 - 2019

Taught weekly recitations and graded problem sets.

SERVICE	Organizer for the Stanford student algebraic geometry seminar Topics: method of Deligne-Illusie, bend and break, variations of Hodge structures	<i>2021-2023</i>
	Directed Reading Program Mentor Mentored an undergraduate reading <i>Model Theory: an Introduction</i> by David Marker	<i>2021</i>
	President, Columbia Society of Physics Students Organized talks, educational outreach, and mentorship opportunities.	<i>2019 - 2020</i>
	Board Member, Columbia Undergraduate Mathematics Society Organized talks, help sessions for new students, and teaching materials.	<i>2019 - 2020</i>

SKILLS

Programming Languages: C/C++, Python, L^AT_EX, Sage, Macaulay2, MAGMA.