

Bradley Dirks

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POSITIONS

Institute for Advanced Study

Member, School of Mathematics

2024-2025

Princeton, NJ

Stony Brook University

Simons Instructor

2023-2027

Stony Brook, NY

NSF Mathematical Sciences Postdoctoral Research Fellow

Stony Brook University

2023-2027

Stony Brook, NY

EDUCATION

University of Michigan

PhD in Mathematics

2018-2023

Ann Arbor, MI

- Thesis: Using Mixed Hodge Modules to Study Singularities

University of California

BA and MA in Mathematics

2014-2018

Los Angeles, CA

TEACHING EXPERIENCE

Instructor

Stony Brook University

Spring 2024

Stony Brook, NY

- MAT310: Linear Algebra

Graduate Student Instructor

University of Michigan

October 2018-Winter 2022

Ann Arbor, MI

- Math 105 (Precalculus), Math 115 (Calculus I), Math 116 (Calculus II)

Docent

LA Math Circle (now ORMC)

2016 - 2018

Los Angeles, CA

RESEARCH INTERESTS

Algebraic Geometry, Singularities, \mathcal{D} -modules, Hodge Theory

PREPRINTS

Hirzebruch-Milnor classes of local complete intersections, minimal exponent, and applications to higher singularities

with Laurențiu Maxim and Sebastián Olano

A Hodge theoretic generalization of \mathbb{Q} -homology manifolds

with Sebastián Olano and Debaditya Raychaudhury

- Submitted

Restrictions of Hodge modules using generalized V -filtrations

with Qianyu Chen and Sebastián Olano

- Submitted

Fourier transform and Radon transform for mixed Hodge modules

- Submitted

Some applications of Microlocalization for LCI subvarieties

- Submitted

Verdier specialization and restrictions of Hodge modules

with Qianyu Chen and Morihiko Saito

- Submitted

PUBLICATIONS

The minimal exponent of cones over smooth complete intersection projective varieties
with Qianyu Chen and Mircea Mustață

- To appear in *Revue Roumaine Math. Pures Appl.*, volume in memory of Lucian Badescu

The minimal exponent and k -rationality for locally complete intersections
with Qianyu Chen and Mircea Mustață

- *Journal de l'École Polytechnique* **11**(2024)

Minimal exponents and V -filtrations of locally complete intersection singularities
with Qianyu Chen, Mircea Mustață and Sebastián Olanó

- *Journal für die reine und angewandte Mathematik (Crelle's journal)* **811**(2024)

An introduction to V -filtrations
with Qianyu Chen and Mircea Mustață

- *Handbook of Geometry and Topology of Singularities*, Volume VII

On V -filtration, Hodge filtration and Fourier Transform
with Qianyu Chen

- *Selecta Mathematica (New Series)* **29**(2023)

Minimal exponents of hyperplane sections: a conjecture of Teissier
with Mircea Mustață

- *J. Eur. Math. Soc.* **25** (2023),

The Hilbert series of Hodge ideals of hyperplane arrangements
with Mircea Mustață

- *Journal of Singularities* **20** (2020)

Upper bounds for roots of B-functions, following Kashiwara and Lichtin
with Mircea Mustață

- *Publ. Res. Inst. Math. Sci.* **58** (2022)

ORGANIZING

AIM Workshop “Higher Du Bois and higher rational singularities” October 28 - November 1, 2024
American Institute of Mathematics. See website *w/ Radu Laza*

Winter School on New Applications of Mixed Hodge Modules January 2024
Simons Center for Geometry and Physics. See website *w/ Christian Schnell*

Student Algebraic Geometry seminar Winter 2021-2023
University of Michigan *w/ Devlin Mallory in Winter 2021, w/ Saket Shah 2022-2023*

\mathcal{D} -modules and Representation Theory Minicourse Summer 2022
University of Michigan

Mixed Hodge Theory Minicourse Summer 2020
University of Michigan *w/ James Hotchkiss*

Variations of Hodge Structure Reading Group Winter 2020
University of Michigan *w/ James Hotchkiss*

INVITED TALKS

JHU Algebraic Geometry Seminar <i>Minimal Exponent for LCI Subvarieties</i>	October 2024 Johns Hopkins University
Princeton University Algebraic Geometry Seminar <i>Minimal Exponent for LCI Subvarieties</i>	September 2024 Princeton University
Birational Geometry Seminar 2024 <i>Recent Results on Minimal Exponent for LCI Subvarieties</i>	May 2024 Online
CUNY Commutative Algebra and Algebraic Geometry Seminar <i>The minimal exponent for LCI subvarieties</i>	March 2024 Graduate Center of CUNY
University of Utah Algebraic Geometry Seminar <i>The minimal exponent for LCI subvarieties</i>	February 2024 University of Utah
Columbia University Algebraic Geometry Seminar <i>The minimal exponent for LCI subvarieties</i>	January 2024 Columbia University
Winter School on New Applications of Mixed Hodge Modules <i>V-filtration and Hodge filtration in higher codimension</i>	January 2024 Simons Center for Geometry and Physics
University of Toronto Algebraic Geometry Seminar <i>The minimal exponent for LCI subvarieties</i>	November 2023 University of Toronto
Harvard/MIT Algebraic Geometry Seminar <i>The minimal exponent for LCI Subvarieties</i>	October 2023 Harvard University
Birational Geometry Seminar 2023 <i>Higher du Bois and higher rational singularities for LCI varieties</i>	May 2023 Online
MAGGC <i>V-filtrations of \mathcal{D}-modules</i>	August 2022 UIC
Algebraic Geometry and Singularities Learning Workshop & Conference <i>Comparing V-filtration of an ideal with that of a general linear combination</i>	June 2022 UW Seattle
Algebraic Geometry Seminar <i>The Structure of Monodromic Mixed Hodge modules</i>	February 2022 Stony Brook University
DOCAS Seminar <i>Understanding the roots of b-functions</i>	August 2021 Online
UConn Algebra Seminar <i>Minimal Exponents and a Conjecture of Teissier</i>	April 2021 Online
Topology and Singularities Seminar in Madison <i>Minimal Exponents and a Conjecture of Teissier</i>	March 2021 Online

AWARDS

NSF Mathematical Sciences Postdoctoral Research Fellowship	National Science Foundation, 2023
Wirt and Mary Cornwell Prize	University of Michigan Mathematics Department, 2023
Rackham Predoctoral Fellowship	University of Michigan, Summer 2022-Winter 2023
Paul Daus Memorial Award	UCLA, 2018
Departmental Honors	UCLA Math Department, 2018
Summa Cum Laude	UCLA, 2018