Jack Petok

Dartmouth College
Kemeny Hall
Hanover, N.H. 03755 USA

US Citizen

Email: jack.petok@dartmouth.edu
URL: https://math.dartmouth.edu/ jpetok/

Current position

2020-2024	*Lecturer*, Dartmouth College, Hanover NH
Sept-Dec 2023	*Guest Researcher*, Hausdorff Institute for Mathematics, Bonn, Germany

Research interests

Classical algebraic geometry; moduli spaces; arithmetic geometry.

Education

2011-2015	BS in Mathematics with Honors, Stanford University
2015-2020	PhD in Mathematics, Rice University (Advised by Anthony Várilly-Alvarado)

Grants, honours & awards

2017	NSF Graduate Research Fellowship Program Honorable Mention

Publications & preprints

Papers available on webpage: https://math.dartmouth.edu/ jpetok/index.html#research

Kodaira dimension of moduli of special $K3^{[2]}$-fourfolds of degree 2 (Journal des Mathématiques Pures et Appliquées, Neuvième Série 173 (2023), 149–171.)

A census of cubic fourfolds over $\mathbb{F}_2$, with Asher Auel, Avinash Kulkarni, and Jonah Weinbaum (submitted, arXiv:2306.09908).

On decompositions for Fano schemes of intersections of two quadrics, with Pieter Belmans, Jishnu Bose, Sarah Frei, Benjamin Gould, James Hotchkiss, Alicia Lamarche, Cristian Rodriguez Avila, and Saket Shah (submitted, arXiv:2403.12517).

Rational points on modular curves of composite level, with Catalina Camacho Navarro, Wanlin Li, Jackson Morrow, and David Zureick-Brown (Preprint).

Zeta functions of K3 categories over finite fields, with Asher Auel (Preprint).

Sections of quadric fourfold bundles over surfaces, with Asher Auel (in preparation).

Talks

The zeta function of a K3 category (October 2023, Junior Trimester Program, Bonn, Germany)

A survey of cubic fourfolds over $\mathbb{F}_2$ (April 2023, South Carolina Algebra, Geometry, and Number Theory Seminar, Columbia, SC)

A survey of cubic fourfolds over $\mathbb{F}_2$ (April 2023, Dartmouth Algebra and Number Theory Seminar)

A census of cubic fourfolds over $\mathbb{F}_2$ (January 2023, JMM Special Session on Arithmetic geometry informed by computation, Boston, MA)

Composite level Galois representations and low genus modular curves (AMS Special Session on Algebraic and analytic methods in the theory of elliptic curves, Amherst MA)

Lightning talk: spaces of sections of quadric bundles (July 2022, Banff Workshop on Derived categories and reconstruction in algebraic geometry)

Spaces of sections of quadric bundles (June 2022, Dartmouth Algebra and Number Theory Seminar)

Spaces of sections of quadric bundles (December 2021, Michigan State Algebraic Geometry Seminar)

Composite level Galois representations and low genus modular curves (October 2021, Dartmouth Algebra and Number Theory Seminar).

Kodaira dimensions of some moduli spaces of hyperkähler fourfolds (October 2021, Algebraic Geometry Northeastern Series (AGNES))

Kodaira dimensions of some moduli spaces of hyperkähler fourfolds (March 2021, Algebraic Geometry Seminar at University of British Columbia)

Kodaira dimensions of some moduli spaces of hyperkähler fourfolds (Fall 2020, Dartmouth Algebra and Number Theory Seminar)

Kodaira dimensions of some moduli spaces of hyperkähler fourfolds (October 2020, AMS Fall Southeastern Sectional Meeting - AMS Special Session on Geometry and Artithmetic of Hyperkähler Manifolds)

Composite level Galois representations and low genus modular curves (June 2020, Chicago Number Theory Day).

Kodaira dimension of moduli spaces of low degree special $K3^{2]}$-fourfolds. and Computation (January 2020, Joint Mathematics Meetings - AMS Special Session on Rational Points on Algebraic Varieties: Theory)

Kodaira dimension of moduli spaces of low degree special $K3^{2]}$-fourfolds (October 2019, Algebra Seminar at Brown University)

Kodaira dimension of moduli of special $K3^{2]}$-fourfolds of degree 2 (May 2019, , Reinventing Rational Points at Institut Henri Poincaré)

Sphere packings in dimensions 8 and 24 (February 2019, , Rice Undergraduate Mathematics Colloquium)

Teaching

Some course webpages: https://math.dartmouth.edu/ jpetok/index.html#teaching

Teaching at Dartmouth

Math 8 (Calculus of functions of one and several variables), Spring 2023

Math 3 (Calculus), Winter 2023

Math 9 (Multivariable Calculus with Linear Algebra), Fall 2022

Math 11 (Accelerated Multivaraible Calculus), Fall 2022

Math 8 (Calculus of functions of one and several variables), Spring 2022

Math 81/Math 111 (Galois Theory) Winter 2022

Math 25 (Number Theory) Fall 2021

Math 31 (Topics in Algebra) Fall 2021

Math 22 (Linear Algebra with Applications) Spring 2021

Math 8 (Calculus of functions of one and several variables), Winter 2020

Math 22 (Linear Algebra with Applications) Fall 2020

Math 8 (Calculus of functions of one and several variables), Fall 2020

Teaching at Rice

Math 365 (Elementary Number Theory), Summer 2020

Qualifying exam course for graduate students, Summer 2020

Math 355 (Linear algebra), Summer 2018

Math 211 Ordinary Differential Equations and Linear Algebra, Fall 2017

Organization and service to the profession

Co-organizer of seminar on Selected Topics Relating To Cubic and Hyperkählers (co-organized with Xuqiang Qin, 2023, Bonn)

Advisor to Dartmouth senior thesis student Jonah Weinbaum (co-advised with Asher Auel and Avinash Kulkarni, 2022-23)

Co-organizer of AMS Special Session on Brauer Groups in Algebraic Geometry and Arithmetic (co-organized with Sarah Frei, 2023, Cincinnati)

Co-organizer of Dartmouth Brauer Group Reading Seminar (co-organized with Richard Haburcak, 2022, Dartmouth)

Co-organizer of Student Number Theory Seminar, (2015—2019, Rice)

Co-organizer of Video Seminar, (2018—2019, Rice)

Departmental Graduate Representative, Gulf Coast Undergraduate Research Symposium, (2019, Rice)

Volunteer and Speaker, Rice MathExplorations and Rice Mathematics Circle, (2015-2019, Rice)

Referee and review work

Revista Matematica Iberoamericana, Documenta Mathematica, zbMath, MathSciNet

Last updated: March 27, 2024