

# Jack Petok

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## Current position

2020-2023 *Lecturer*, Dartmouth College

## 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

Modular curves of low composite level and genus zero subgroups, with Catalina Camacho, Wanlin Li, Jackson Morrow, and David Zureick-Brown (Preprint, available upon request).

Kodaira dimension of moduli of special  $K3^{[2]}$ -fourfolds of degree 2 (Revision under review, available on arXiv).

Some observations on the space of sections of a quadric bundle, with Asher Auel (in preparation).

A census of cubic fourfolds over  $\mathbb{F}_2$ , with Asher Auel, Avinash Kulkarni, and Jonah Weinbaum (in preparation, data available upon request).

## Talks

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 Arithmetic 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

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 Multivariable Calculus), Fall 2022

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

Math 81/Math III (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

### **Service to the profession**

Co-organizer of AMS Special Session on Brauer Groups in Algebraic Geometry and arithmetic

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

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

Gulf Coast Undergraduate Research Symposium, (2019, Rice) Math department graduate representative

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

Advisor to Dartmouth senior thesis student Jonah Weinbaum (2022-23)

### **Referee**

Revista Matematica Iberoamericana, Documenta Mathematica.