Yaim Cooper

CONTACT INFORMATION	Fuld 211 School of Math Institute for Advanced Study One Einstein Drive Princeton, NJ 08544	*Phone:* (425) 830-2001 *E-mail:* yaim@math.ias.edu

Fuld 211
School of Math
Institute for Advanced Study
One Einstein Drive
Princeton, NJ 08544

Phone: (425) 830-2001
E-mail: yaim@math.ias.edu

PROFESSIONAL APPOINTMENTS

Institute of Advanced Study　　　　　　　　　　　　　　　　　Princeton, NJ

Visitor　　　　　　　　　　　　　　　　　　*September 2018 - August 2020*

Princeton University　　　　　　　　　　　　　　　　　　　　Princeton, NJ

Lecturer　　　　　　　　　　　　　　　　*September 2019-January 2020*

Mathematical Science Research Institute　　　　　　　　　　　Berkeley, CA

Viterbi Postdoctoral Fellow　　　　　　　　　　*January 2018 - June 2018*

Institute of Advanced Study　　　　　　　　　　　　　　　　　Princeton, NJ

Visitor　　　　　　　　　　　　　　　*September 2017 - December 2017*

Harvard University　　　　　　　　　　　　　　　　　　　　Cambridge, MA

Lecturer and NSF Postdoctoral Fellow　　　　　*September 2013 - August 2017*

EDUCATION

Princeton University　　　　　　　　　　　　　　　　　　　　Princeton, NJ
Ph.D. in Mathematics　　　　　　　　　　　　　　　　　　*June 2013*
　　Advisor: Rahul Pandharipande

University of California, Berkeley　　　　　　　　　　　　　Berkeley, CA
M.A. in Mathematics　　　　　　　　　　　　　　　　　　*June 2008*

Massachusetts Institute of Technology　　　　　　　　　　Cambridge, MA
B.S. in Mathematics　　　　　　　　　　　　　　　　　　*June 2007*

HONORS AND AWARDS

Alice T. Schafer Prize: Runner Up　　　　　　　　　　　　　　*2007*
　for top undergraduate woman in mathematics in the U.S.
MIT AMITA Award　　　　　　　　　　　　　　　　　　　　*2007*
　for top graduating woman at MIT

National Science Foundation Graduate Research Fellowship	*2007–2010*

Princeton University Presidential Award	*2008–2010*

National Science Foundation Mathematical Sciences Postdoctoral Research Fellowship	*2013–2016*

PUBLICATIONS

The loss landscape of overparameterized neural networks,
arXiv:1804.10200. Submitted.

A Fock Space approach to Severi Degrees of Hirzebruch Surfaces,
arxiv 1709.01159. Submitted.

A Fock Space approach to Severi Degrees with R. Pandharipande,
Proceedings of the London Mathematical Society, 114 (2017) no. 3, 476–494.

Geometry of Stable Quotients in Genus One, Mathematische Annalen,
361 (2015), no. 3-4, 943–979.

Mirror Symmetry for Stable Quotients Invariants with A. Zinger,
Michigan Math Journal, 63 (2014), no. 3, 571–621.

Properties of a Finite Graph Determined by its Zeta Function,
Electronic Journal of Combinatorics, **16** (2009).

Congruences For Modular Forms of Non-Positive Weight with N. Wage
and I. Wang, International Journal of Number Theory, **4** (2008), 1–13.

WORKS IN PROGRESS

Descendent Gromov-Witten invariants of surfaces via operators

The geometry of the critical loci for overparameterized neural networks

LEADERSHIP	Co-organizer of the MIT/Harvard Algebraic Geometry Seminar	*2013–2016*
	Co-organizer of the Graduate Student Seminar at Princeton	*2009–2010*
	Vice President of the Undergraduate Math Association at MIT	*2006–2007*

TEACHING EXPERIENCE	**Math 202 (Linear Algebra) at Princeton.** *Fall 2019*	
	Math 137 (Undergraduate Algebraic Geometry) at Harvard. An introduction to algebraic geometry.	*Spring 2015*
	Math 121 (Linear algebra and applications) at Harvard.	*Fall 2014*
	Math 273x (Topics in Gromov-Witten Theory) at Harvard. A graduate level introduction to Gromov-Witten Theory.	*Fall 2013*
	Math 202 (Linear Algebra) at Princeton. *Fall 2011*	

SERVICE

Referee for Electronic Journal of Combinatorics and International Mathematics Research Notices.

OUTREACH	*What is a neural network?* Research talks for Undergraduates Princeton University	*November 23 2019*

Counting curves
Noetherian Ring Lunch Seminar
Princeton University   *April 19 2019*

Volunteer at Oakland/East Bay Math Circle.
Taught middle school students and separately, their teachers, bimonthly.   *2007–2008*

Interview feature in Girls' Angle bulletin   *October 2007*

CONFERENCE
TALKS
The loss function of overparameterized neural networks
Algebraic Geometry and Machine Learning Minisymposium
at SIAM Mathematics of Data Science conference, Cincinnati, OH   *May 5-7 2020*

Computing descendent insertions for surfaces
AMS/MMA Joint Math Meetings, Denver CO   *January 15 2020*

The loss function of overparameterized neural networks
AMS/MMA Joint Math Meetings, Denver CO   *January 17 2020*

The geometry of the loss landscape in deep learning
Math & Machine Learning Workshop (Boston College Math Department)   *September 24-25 2018*

Severi degrees via representation theory
AGNES: Algebraic Geometry Northeastern Series (Brown University)   *September 22 2018*

A Fock space approach to Severi degrees of Hirzebruch surfaces
Mirror Symmetry Conference for Young Researchers (University of Michigan)   *May 31 2017*

A Fock space approach to Severi degrees
Curves on Surfaces and Three-folds (EPFL)   *June 20-24 2016*

The geometry of stable quotient spaces in genus one
Workshop on Enumerative Geometry and Calabi Yau Varieties, Fields Institute   *Oct 2013*

The geometry of stable quotient spaces
FRG Workshop on Gromov-Witten Theory, Columbia University   *Apr 2013*

Congruences for Modular Forms of Non-positive Weight
Talk at AMS/MAA Joint Mathematics Meeting   *Jan 2007*

SEMINAR TALKS
Severi degrees via representation theory
University of Michigan Geometry and Physics Seminar   *April 29 2019*

Severi degrees via representation theory
Rutgers Algebra Seminar   *April 24 2019*

Severi degrees via representation theory
CSU Front Range Algebraic Geometry and Number Theory Seminar   *March 14 2019*

Severi degrees via representation theory
UIUC Algebraic Geometry Seminar   *November 13 2018*

The geometry of the loss landscape in deep learning (poster)
Optimization day (Princeton University)   *September 28 2018*

Severi degrees via representation theory
Enumerative Geometry Beyond Numbers Main Seminar(MSRI)   *May 9 2018*

A Fock space approach to Severi degrees of Hirzebruch surfaces
San Francisco State University Geometry and Topology Seminar   *March 6 2017*

A Fock space approach to Severi degrees
Geometry, Physics, Representation Theory Seminar, Northeastern University   *Mar 2015*

Moduli spaces of stable quotients in genus 0 and 1
Algebra and Algebraic Geometry Seminars, Brown University   *Apr 2014*

The geometry of stable quotient spaces in genus one
Geometry and Physics Seminar, Boston University   *Apr 2014*

Stable Quotients in Low Genus
Algebraic Geometry Seminar, University of Illinois, Chicago   *Mar 2014*

Moduli spaces of stable quotients in genus 0 and 1
Southern California Algebraic Geometry Seminar, University of Southern California   *Feb 2014*

Stable Quotients in Low Genus
Algebraic Geometry Seminar, Rice University   *Jan 2014*

Counting rational curves in the plane
Algebra and Geometry Seminar, Tufts University   *Nov 2013*

Comparing Stable Quotients and Stable Maps
Geometry and Physics Seminar, University of Michigan   *Dec 2012*

Comparing Stable Quotients and Stable Maps
Algebraic Geometry Seminar, Harvard/MIT   *Nov 2012*

Comparing Stable Quotients and Stable Maps
Number Theory/Algebraic Geometry Seminar, Boston College   *Nov 2012*

Comparing Stable Quotients and Stable Maps
Algebraic Geometry Seminar, The Ohio State University   *Nov 2012*

Geometry of Stable Quotient Spaces
Junior Geometry Seminar, Imperial College, London   *Jan 2011*

Geometry of Stable Quotient Spaces in Genus One
Algebraic Geometry Seminar, Instituto Superior Technico, Lisbon   *Oct 2010*

An Application of Gromov-Witten Theory: Bounding the Slope of M_g
Student Algebraic Geometry seminar, Harvard   *Dec 2009*

Algebraic Curves and their Realizations
Graduate Student Seminar, Princeton   *Nov 2009*

Congruences for Modular Forms of Non-positive Weight
Talk for the Undergraduate Math Association, MIT   *Oct 2006*

Properties Determined by the Ihara Zeta Function of a Graph
Talk in research session of Program for Women and Mathematics   *May 2006*

Conferences, Workshops and Schools	Workshop on Theory of Deep Learning: Where next? (Institute for Advanced Study)	*October 15-18 2019*
	Double ramification cycles and integrable systems (American Institute of Mathematics)	*October 7-11 2019*
	AGNES (UMass Amherst)	*March 22-24 2019*
	NeurIPS: (Montreal Convention Center)	*December 2018*
	Math & Machine Learning Workshop (Boston College Math Department)	*September 24-25 2018*
	AGNES (Brown)	*September 20-22 2018*

Crossing the Walls in Enumerative Geometry 2018 (Snowbird)	*May 28 - June 1 2018*
RTG/FRG Mirror Symmetry Conference for Young Researchers (University of Michigan)	*May 29-June 2 2017*
AGNES (UMass Amherst)	*November 4-6 2016*
Curves on Surfaces and Three-folds (EPFL)	*June 20-24 2016*
Workshop on Equivariant Gromov-Witten Theory and Applications (Simons Center for Geometry and Physics)	*May 12-16 2014*
AGNES (State University of New York Stony Brook)	*April 25-27 2014*
AGNES (Boston College)	*October 25-27 2013*
Geometry and Topology of Moduli (Humboldt Universität zu Berlin)	*October 10-12 2012*
AGNES (University of Massachussetts at Amherst)	*March 31-April 1 2012*
AGNES (SUNY Stony Brook)	*October 29-30 2011*
Celebration of Joe Harris' 60th birthday (Harvard University)	*August 25-28 2011*
Moduli Spaces of Riemann Surfaces (PCMI)	*July 3-23 2011*
Workshop on Derived Categories (Isaac Newton Institute, Cambridge, UK)	*April 11-15 2011*
School on Moduli Spaces (Isaac Newton Institute, Cambridge, UK)	*January 5-14 2011*
Intersection Theory on Moduli Space of Curves (Humboldt Universität zu Berlin)	*October 13-15 2010*
School on Birational Geometry and Moduli Spaces (University of Utah)	*June 12-18 2010*
AGNES (University of Massachusetts at Amherst)	*April 10-11 2010*
Classical Algebraic Geometry Today (MSRI)	*January 26-30 2009*
Modern Moduli Theory (MSRI)	*February 23-27 2009*

LANGUAGES   Native: English.
Speak: Chinese.
Read: French.