

ELLIOT KAPLAN

Hamilton Hall Room 103D \diamond 1280 Main Street West \diamond Hamilton, Ontario L8S 4K1

kaplae2@mcmaster.ca \diamond elliotakaplan.github.io

EMPLOYMENT

McMaster University

July 2021 – June 2024

- NSF postdoctoral fellow
- Postdoctoral fellow at the Fields Institute from July 2021 through June 2022
- Visitor at the Max Planck Institute for Mathematics for June 2023

EDUCATION

University Illinois at Urbana-Champaign

- Doctorate in mathematics, May 2021
- Dissertation: *Derivations on o-minimal fields*, advised by Lou van den Dries

Ohio University

- Bachelor of science, Honors Tutorial College, May 2015
- Undergraduate thesis: *Initial embeddings in the surreal number tree*, advised by Philip Ehrlich

RESEARCH INTERESTS

Model theory and its applications. Especially o-minimality, valued fields, and differential fields.

PUBLICATIONS

Liouville closed H_T -fields

2023

J. Algebra, vol. 628, pp. 265–327, 2023. [↗](#) [📄](#)

T -convex T -differential fields and their immediate extensions

2022

Pacific J. Math., vol. 320, no. 2, pp. 261–298, 2022. [↗](#) [📄](#)

Surreal ordered exponential fields

2021

With Philip Ehrlich

J. Symb. Log., vol. 86, no. 3, pp. 1066–1115, 2021. [↗](#) [📄](#)

Generic derivations on o-minimal structures

2021

With Antongiulio Fornasiero

J. Math. Log., vol. 21, no. 2, pp. Paper No. 2150007, 45, 2021. [↗](#) [📄](#)

Pairs of theories satisfying a Mordell-Lang condition

2020

With Alexi Block Gorman and Philipp Hieronymi

Fund. Math., vol. 251, no. 2, pp. 131–160, 2020. [↗](#) [📄](#)

Distality for the asymptotic couple of the field of logarithmic transseries

2020

With Allen Gehret







Notre Dame J. Form. Log., vol. 61, no. 2, pp. 341–361, 2020. [↗](#) [📄](#)

Continuous regular functions









2020

With Alexi Block Gorman, Philipp Hieronymi, Ruoyu Meng, Erik Walsberg, Zihe Wang, Ziqin Xiong, and Hongru Yang

Log. Methods Comput. Sci., vol. 16, no. 1, pp. Paper No. 17, 24, 2020. [↗](#) [📄](#)

Logarithmic hyperseries	2019
With Lou van den Dries and Joris van der Hoeven	
<i>Trans. Amer. Math. Soc.</i> , vol. 372, no. 7, pp. 5199–5241, 2019.  	
Number systems with simplicity hierarchies II	2018
With Philip Ehrlich	
<i>J. Symb. Log.</i> , vol. 83, no. 2, pp. 617–633, 2018.  	
Resolution depth of positive braids	2015
With David Krcatovich and Patricia O'Brien	
<i>J. Knot Theory Ramifications</i> , vol. 24, no. 14, pp. 1550075, 12, 2015.  	

PREPRINTS

Monotone T-convex T-differential fields	2023
With Nigel Pynn-Coates	
<i>Submitted.</i>  	
A dichotomy for T-convex fields with monomial group	2023
With Christoph Kesting	
<i>Submitted.</i>  	
Hilbert polynomials for finitary matroids	2022
With Antongiulio Fornasiero	
<i>Submitted.</i>  	
Hyperserial fields	2021
With Vincent Bagayoko and Joris van der Hoeven	
<i>Submitted.</i>  	

AWARDS AND ACHIEVEMENTS

NSF Mathematical Sciences Postdoctoral Research Fellowship (MSPRF)	2021 – 2024
List of Teachers Ranked as Excellent by Their Students	2015, 2017 – 2020
Kuo-Tsai Chen Prize in Mathematics	2019
Waldemar J., Barbara G., and Juliette Alexandra Trjitzinsky Fellowship	2019
Honorable mention, Graduate Research Fellowship Program	2016
Graduate College Conference Travel Award	2016
U.S. Junior Oberwolfach Fellows NSF Grant (DMS-1641185)	2016

TALKS AT WORKSHOPS AND SPECIAL SESSIONS

Banff International Research Station	February 2023
Workshop on Neostability.	
Oberwolfach Research Institute for Mathematics	November 2022
Mini-Workshop on Topological and Differential Expansions of o-minimal Structures.	
AMS Spring Central Sectional Meeting at Purdue University	April 2020
Model Theory and its Applications Special Session, canceled due to COVID-19.	
North American meeting of the Association of Symbolic Logic at UC Irvine	March 2020
Model Theory Special Session, canceled due to COVID-19.	

Oberwolfach Research Institute for Mathematics

December 2016

Mini-Workshop on Surreal Numbers, Surreal Analysis, Hahn Fields and Derivations.

Joint Math Meetings in Seattle, WA

January 2016

Surreal Numbers Special Session.

SEMINAR TALKS

Oberseminar Modelltheorie, Geometrie und Gruppentheorie at Uni Münster	June 2023
Guest talk at HHU Düsseldorf	June 2023
Oberseminar Logik at Universität Bonn	June 2023
Leeds Logic Seminar	May 2023
Online Logic Seminar	March 2023
Purdue University Model Theory and Applications Seminar	March 2023
Logic Seminar at The Ohio State University	February 2023
Waterloo Logic Seminar	January 2023
Geometry and Model Theory Seminar at the Fields Institute	October 2022
Fields Postdoc Colloquium	April 2022
Geometry and Model Theory Seminar at the Fields Institute	January 2022
Kolchin Seminar in Differential Algebra	October 2021
Model Theory Seminar at the Fields Institute	August 2021
Topological and Differential Expansions of O-minimal Structures Seminar	February 2021
Manchester Logic Seminar	June 2020
Notre Dame Logic Seminar	June 2020
Séminaire de Logique Lyon-Paris	May 2020
Caltech-UCLA Logic Seminar	February 2020
Logic Seminar at The Ohio State University	November 2019
Graduate Model Theory Seminar at UCLA	January 2018

OUTREACH/GENERAL AUDIENCE TALKS

Casual Math Seminar at McMaster	March 2023
An introduction to combinatorial game theory aimed at a graduate student audience.	
Summer Illinois Mathematics Camp at UIUC	July 2018
A discussion of the basics of knot theory aimed at a high school audience.	

CONTRIBUTED TALKS

Joint Math Meetings in Denver, CO	January 2020
North American meeting of the Association of Symbolic Logic at CUNY	May 2019
Graduate Student Conference in Logic XIX	April 2018
Graduate Student Conference in Logic XVIII	April 2017

TEACHING AND MENTORSHIP EXPERIENCE

McMaster University

Fall 2022 – Fall 2023

- Instructor for Linear Algebra I (Fall 2023).
- Instructor for Engineering Mathematics I (Fall 2022).

University of Illinois at Urbana-Champaign

Fall 2015 – Fall 2020

- Discussion section leader for Calculus II (Fall 2015, Summer 2020), Calculus III (Fall 2016, Spring 2017, Fall 2018, Fall 2019), and Applied Linear Algebra (Spring 2018, Fall 2020).
- Head teaching assistant for Elementary Linear Algebra (Fall 2017) and Applied Linear Algebra (Spring 2018, Fall 2020).
- Grader for Mathematical Logic (Fall 2016, Fall 2017) and General Topology (Fall 2017).

Preliminary Arizona Winter School (PAWS)

Fall 2022

The Southwest Center for Arithmetic Geometry

Course assistant for Ronnie Nagloo's course *Introduction to model theory with applications*.

Program for Interdisciplinary and Industrial Internships at Illinois

Summer 2019

University of Illinois at Urbana-Champaign

Workshop leader for a three-day workshop on advanced linear algebra topics for graduate students.

Illinois Geometry Lab

Summer 2019

Graduate Team Leader for a group of three undergraduate students. I designed and ran a research project on three-player combinatorial games.

Illinois Geometry Lab

Spring 2018

Graduate Mentor for a group of four undergraduate students. I helped lead a research project studying functions recognizable by Büchi automata.

PROFESSIONAL SERVICE

Co-organizer: ASL Special Session on Tame Geometry and Applications to Analysis January 2023
At the Joint Math Meetings in Boston, MA

Co-organizer: Graduate Student Conference in Logic XXII March 2021

Organizer: Nonstandard Analysis Learning Seminar at UIUC Spring 2021

Co-organizer: Graduate Student Conference in Logic XVIII April 2017

Graduate student member: Undergraduate Affairs Committee at UIUC 2019 – 2020

Referee: Algebra and Number Theory.

Reviewer: Mathematical Reviews.

OTHER WORK EXPERIENCE

Summer Intern

Summer 2016

Wolfram Research

Summer Researcher at UIUC

Summer 2015

Part of the Program for Interdisciplinary and Industrial Internships at Illinois

Undergraduate Researcher at Michigan State University

Summer 2014

Part of the Summer Undergraduate Research Institute in Experimental Mathematics

CRLA Certified Mathematics Tutor with Ohio University Tutoring Services 2012 – 2015

Lead Mathematics Tutor from Fall 2014 through Spring 2015