

# ELLIOT KAPLAN

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## EMPLOYMENT

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### Max Planck Institute for Mathematics

2024 – 2025

- Postdoctoral fellow

### McMaster University

2021 – 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

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### University of Illinois 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
- Mathematics major, philosophy minor, graduated summa cum laude
- Undergraduate thesis: *Initial embeddings in the surreal number tree*, advised by Philip Ehrlich

## RESEARCH INTERESTS

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

## PUBLICATIONS

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### Monotone $T$ -convex $T$ -differential fields

2024<sup>+</sup>

With Nigel Pynn-Coates

*Model Theory*, to appear. [↗](#) [📄](#)

### Hilbert polynomials for finitary matroids

2024

With Antongiulio Fornasiero

*Pacific J. Math.*, vol. 333, no. 2, pp. 273–308 (2024) [↗](#) [📄](#)

### A dichotomy for $T$ -convex fields with a monomial group

2024

With Christoph Kesting

*MLQ Math. Log. Q.*, vol. 70, no. 1, pp. 99–110 (2024) [↗](#) [📄](#)

### 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) [↗](#) [📄](#)

<b>Generic derivations on o-minimal structures</b>	2021
With Antongiulio Fornasiero	
<i>J. Math. Log.</i> , vol. 21, no. 2, paper no. 2150007, 45p. (2021)  	
<b>Pairs of theories satisfying a Mordell-Lang condition</b>	2020
With Alexi Block Gorman and Philipp Hieronymi	
<i>Fund. Math.</i> , vol. 251, no. 2, pp. 131–160 (2020)  	
<b>Distality for the asymptotic couple of the field of logarithmic transseries</b>	2020
With Allen Gehret	
<i>Notre Dame J. Form. Log.</i> , vol. 61, no. 2, pp. 341–361 (2020)  	
<b>Continuous regular functions</b>	2020
With Alexi Block Gorman, Philipp Hieronymi, Ruoyu Meng, Erik Walsberg, Zihe Wang, Ziqin Xiong, and Hongru Yang	
<i>Log. Methods Comput. Sci.</i> , vol. 16, no. 1, paper no. 17, 24p. (2020)  	
<b>Logarithmic hyperseries</b>	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)  	
<b>Number systems with simplicity hierarchies II</b>	2018
With Philip Ehrlich	
<i>J. Symb. Log.</i> , vol. 83, no. 2, pp. 617–633 (2018)  	
<b>Resolution depth of positive braids</b>	2015
With David Krcatovich and Patricia O’Brien	
<i>J. Knot Theory Ramifications</i> , vol. 24, no. 14, paper no. 1550075, 12p. (2015)  	

## PREPRINTS

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<b>Constant power maps on Hardy fields and transseries</b>	2024
<i>Submitted.</i>  	
<b>Hyperserial fields</b>	2021
With Vincent Bagayoko and Joris van der Hoeven	
<i>Submitted.</i>  	

## AWARDS AND ACHIEVEMENTS

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

## TALKS AT WORKSHOPS AND SPECIAL SESSIONS

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<b>INdAM Intensive Period at the University of Naples</b> Mini-Workshop on Recent Developments in the Model Theory of Fields.	May 2025
<b>Centre International de Rencontres Mathématiques</b> Conference on Tame Geometry.	February 2025
<b>AMS-UMI International Joint Meeting in Palermo</b> Model Theory Special Session.	July 2024
<b>CMS Summer Meeting at the University of Saskatchewan</b> Mathematical Logic in Canada Special Session.	June 2024
<b>North American meeting of the Association of Symbolic Logic at Iowa State</b> Model Theory Special Session.	May 2024
<b>AMS Sectional Meeting at the University of Wisconsin-Milwaukee</b> Model Theory Special Session.	April 2024
<b>Banff International Research Station</b> Workshop on Exponential Fields.	February 2024
<b>Banff International Research Station</b> Workshop on Neostability.	February 2023
<b>Oberwolfach Research Institute for Mathematics</b> Mini-Workshop on Topological and Differential Expansions of o-minimal Structures.	November 2022
<b>AMS Spring Central Sectional Meeting at Purdue University</b> Model Theory and its Applications Special Session, canceled due to COVID-19.	April 2020
<b>North American meeting of the Association of Symbolic Logic at UC Irvine</b> Model Theory Special Session, canceled due to COVID-19.	March 2020
<b>Oberwolfach Research Institute for Mathematics</b> Mini-Workshop on Surreal Numbers, Surreal Analysis, Hahn Fields and Derivations.	December 2016
<b>Joint Math Meetings in Seattle, WA</b> AMS-ASL Special Session on Surreal Numbers.	January 2016

## SEMINAR AND COLLOQUIUM TALKS

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<b>AI Seminar at the Czech Technical University in Prague</b>	January 2025
<b>Théorie des Modèles et Groupes at IMJ-PRG</b>	November 2024
<b>Séminaire Général de Logique at IMJ-PRG</b>	November 2024
<b>Logic Seminar at The Ohio State University</b>	April 2024
<b>Logic Colloquium at the Kurt Gödel Research Center</b>	March 2024
<b>Waterloo Logic Seminar</b>	January 2024
<b>Oberseminar Modelltheorie, Geometrie und Gruppentheorie at Uni Münster</b>	June 2023
<b>Guest talk at HHU Düsseldorf</b>	June 2023
<b>Oberseminar Logik at Universität Bonn</b>	June 2023
<b>Leeds Logic Seminar</b>	May 2023
<b>Online Logic Seminar</b>	March 2023

<b>Purdue University Model Theory and Applications Seminar</b>	March 2023
<b>Logic Seminar at The Ohio State University</b>	February 2023
<b>Waterloo Logic Seminar</b>	January 2023
<b>Geometry and Model Theory Seminar at the Fields Institute</b>	October 2022
<b>Fields Postdoc Colloquium</b>	April 2022
<b>Geometry and Model Theory Seminar at the Fields Institute</b>	January 2022
<b>Kolchin Seminar in Differential Algebra</b>	October 2021
<b>Model Theory Seminar at the Fields Institute</b>	August 2021
<b>Topological and Differential Expansions of O-minimal Structures Seminar</b>	February 2021
<b>Manchester Logic Seminar</b>	June 2020
<b>Notre Dame Logic Seminar</b>	June 2020
<b>Séminaire de Logique Lyon-Paris</b>	May 2020
<b>Caltech-UCLA Logic Seminar</b>	February 2020
<b>Logic Seminar at The Ohio State University</b>	November 2019
<b>Graduate Model Theory Seminar at UCLA</b>	January 2018

#### OUTREACH/GENERAL AUDIENCE TALKS

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

#### CONTRIBUTED TALKS

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<b>Joint Math Meetings in Denver, CO</b>	January 2020
<b>North American meeting of the Association of Symbolic Logic at CUNY</b>	May 2019
<b>Graduate Student Conference in Logic XIX</b>	April 2018
<b>Graduate Student Conference in Logic XVIII</b>	April 2017
<b>North American meeting of the Association of Symbolic Logic at UIUC</b>	March 2015

#### TEACHING AND MENTORSHIP

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<b>McMaster University</b>	2022 – 2023
<ul style="list-style-type: none"> <li>· Instructor for Linear Algebra I (Fall 2023).</li> <li>· Instructor for Engineering Mathematics I (Fall 2022).</li> </ul>	
<b>University of Illinois at Urbana-Champaign</b>	2015 – 2020
<ul style="list-style-type: none"> <li>· 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).</li> <li>· Head teaching assistant for Elementary Linear Algebra (Fall 2017) and Applied Linear Algebra (Spring 2018, Fall 2020).</li> <li>· Grader for Mathematical Logic (Fall 2016, Fall 2017) and General Topology (Fall 2017).</li> </ul>	

<b>Preliminary Arizona Winter School (PAWS)</b> <i>The Southwest Center for Arithmetic Geometry</i> Course assistant for Ronnie Nagloo's course <i>Introduction to model theory with applications</i> .	Fall 2022
<b>Program for Interdisciplinary and Industrial Internships at Illinois</b> <i>University of Illinois at Urbana-Champaign</i> Workshop leader for a three-day workshop on advanced linear algebra topics for graduate students.	Summer 2019
<b>Illinois Geometry Lab</b> Graduate Team Leader for a group of three undergraduate students. I designed and ran a research project on three-player combinatorial games.	Summer 2019
<b>Illinois Geometry Lab</b> Graduate Mentor for a group of four undergraduate students. I helped lead a research project studying functions recognizable by Büchi automata.	Spring 2018

## PROFESSIONAL SERVICE AND OUTREACH

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<b>Co-organizer:</b> Oberseminar Logik at Universität Bonn	2024 – 2025
<b>Volunteer:</b> OSU Math Department Booth at the COSI Science Festival	May 2024
<b>Co-organizer:</b> McMaster-Waterloo Model Theory Learning Seminar	Spring 2024
<b>Co-organizer:</b> ASL Special Session on Tame Geometry and Applications to Analysis <i>At the Joint Math Meetings in Boston, MA</i>	January 2023
<b>Co-organizer:</b> Graduate Student Conference in Logic XXII	March 2021
<b>Organizer:</b> Nonstandard Analysis Learning Seminar at UIUC	Spring 2021
<b>Graduate student member:</b> Undergraduate Affairs Committee at UIUC	2019 – 2020
<b>Volunteer:</b> Illinois Geometry Lab Booth at Illini Fest – Chicago	July 2019
<b>Co-organizer:</b> Graduate Student Conference in Logic XVIII	April 2017
<b>Referee:</b> Algebra and Number Theory, Crelle's Journal.	
<b>Reviewer:</b> Mathematical Reviews.	

## OTHER WORK EXPERIENCE

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<b>Summer Intern</b> <i>Wolfram Research</i>	Summer 2016
<b>Summer Researcher at UIUC</b> <i>Part of the Program for Interdisciplinary and Industrial Internships at Illinois</i>	Summer 2015
<b>Undergraduate Researcher at Michigan State University</b> <i>Part of the Summer Undergraduate Research Institute in Experimental Mathematics</i>	Summer 2014
<b>CRLA Certified Mathematics Tutor with Ohio University Tutoring Services</b> <i>Lead Mathematics Tutor from Fall 2014 through Spring 2015</i>	2012 – 2015