# ELLIOT KAPLAN

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## EMPLOYMENT

### 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

### 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

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

## PUBLICATIONS

### 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) ⤴ 🗎

### Generic derivations on o-minimal structures                           2021
With Antongiulio Fornasiero
*J. Math. Log.*, vol. 21, no. 2, paper no. 2150007, 45p. (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, paper no. 17, 24p. (2020) ⬈ 🗎

**Logarithmic hyperseries** 2019
With Lou van den Dries and Joris van der Hoeven
*Trans. Amer. Math. Soc.*, vol. 372, no. 7, pp. 5199–5241 (2019) ⬈ 🗎

**Number systems with simplicity hierarchies II** 2018
With Philip Ehrlich
*J. Symb. Log.*, vol. 83, no. 2, pp. 617–633 (2018) ⬈ 🗎

**Resolution depth of positive braids** 2015
With David Krcatovich and Patricia O'Brien
*J. Knot Theory Ramifications*, vol. 24, no. 14, paper no. 1550075, 12p. (2015) ⬈ 🗎

## PREPRINTS

**Monotone $T$-convex $T$-differential fields** 2023
With Nigel Pynn-Coates
*Submitted.* ⬈ 🗎

**Hilbert polynomials for finitary matroids** 2022
With Antongiulio Fornasiero
*Submitted.* ⬈ 🗎

**Hyperserial fields** 2021
With Vincent Bagayoko and Joris van der Hoeven
*Submitted.* ⬈ 🗎

## AWARDS AND ACHIEVEMENTS

**FNRS Postdoctoral Research Fellowship** (deferred) 2024

**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

**Centre International de Rencontres Mathématiques** February 2025
Conference on Tame Geometry.

**AMS-UMI International Joint Meeting in Palermo** July 2024
Model Theory Special Session.

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| **CMS Summer Meeting at the University of Saskatchewan** | June 2024 |
| Mathematical Logic in Canada Special Session. | |
| **North American meeting of the Association of Symbolic Logic at Iowa State** | May 2024 |
| Model Theory Special Session. | |
| **AMS Sectional Meeting at the University of Wisconsin-Milwaukee** | April 2024 |
| Model Theory Special Session. | |
| **Banff International Research Station** | February 2024 |
| Workshop on Exponential Fields. | |
| **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 |
| AMS-ASL Special Session on Surreal Numbers. | |

## SEMINAR AND COLLOQUIUM TALKS

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| **Logic Seminar at The Ohio State University** | April 2024 |
| **Logic Colloquium at the Kurt Gödel Research Center** | March 2024 |
| **Waterloo Logic Seminar** | January 2024 |
| **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 |

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| **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 for a graduate student audience.

**Summer Illinois Mathematics Camp at UIUC**     July 2018
A discussion of the basics of knot theory for a high school audience.

## CONTRIBUTED TALKS

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| **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 |
| **North American meeting of the Association of Symbolic Logic at UIUC** | March 2015 |

## TEACHING AND MENTORSHIP

**McMaster University**     2022 – 2023
· Instructor for Linear Algebra I (Fall 2023).
· Instructor for Engineering Mathematics I (Fall 2022).

**University of Illinois at Urbana-Champaign**     2015 – 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 AND OUTREACH

**Volunteer:** OSU Math Department Booth at the COSI Science Festival — May 2024

**Co-organizer:** McMaster-Waterloo Model Theory Learning Seminar — Spring 2024

**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

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

**Volunteer:** Illinois Geometry Lab Booth at Illini Fest – Chicago — July 2019

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

**Referee:** Algebra and Number Theory, Crelle's Journal.

**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*