

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

Hilbert polynomials for finitary matroids

2024⁺

With Antongiulio Fornasiero

Pacific J. Math., to appear. [↗](#) [↖](#)

Monotone T -convex T -differential fields

2024⁺

With Nigel Pynn-Coates

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

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) [↗](#) [↖](#)

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|---|------|
| Generic derivations on o-minimal structures | 2021 |
| With Antongiulio Fornasiero | |
| <i>J. Math. Log.</i> , 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 | |
| <i>Fund. Math.</i> , vol. 251, no. 2, pp. 131–160 (2020)   | |
| Distality for the asymptotic couple of the field of logarithmic transseries | 2020 |
| With Allen Gehret | |
| <i>Notre Dame J. Form. Log.</i> , 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 | |
| <i>Log. Methods Comput. Sci.</i> , vol. 16, no. 1, paper no. 17, 24p. (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, paper no. 1550075, 12p. (2015)   | |

PREPRINTS

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

AWARDS AND ACHIEVEMENTS

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| F.R.S.-FNRS Postdoctoral Research Fellowship “CR” (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

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

SEMINAR AND COLLOQUIUM TALKS

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| AI Seminar at the Czech Technical University in Prague | January 2025 |
| Théorie des Modèles et Groupes at IMJ-PRG | November 2024 |
| Séminaire Général de Logique at IMJ-PRG | November 2024 |
| 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 |

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| 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

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| 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

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| McMaster University | 2022 – 2023 |
| <ul style="list-style-type: none"> · Instructor for Linear Algebra I (Fall 2023). · Instructor for Engineering Mathematics I (Fall 2022). | |
| University of Illinois at Urbana-Champaign | 2015 – 2020 |
| <ul style="list-style-type: none"> · 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). | |

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| Preliminary Arizona Winter School (PAWS) <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 |
| Program for Interdisciplinary and Industrial Internships at Illinois <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 |
| Illinois Geometry Lab Graduate Team Leader for a group of three undergraduate students. I designed and ran a research project on three-player combinatorial games. | Summer 2019 |
| Illinois Geometry Lab 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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| Co-organizer: Oberseminar Logik at Universität Bonn | 2024 – 2025 |
| 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 <i>At the Joint Math Meetings in Boston, MA</i> | January 2023 |
| 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

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