

Zalán Molnár

Curriculum Vitae

First name: Zalán
Surname: Molnár
Birth date: 17 March 1995
Nationality: Hungarian
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Area of interest

Primary interest: MSC 03 – Mathematical logic and foundations
(model theory, algebraic logic, modal logic)

Secondary interest: History and philosophy of mathematics & logic

Employment

2024 – Assistant Professor, Department of Logic, Institute of Philosophy, Eötvös Loránd University (ELTE)

Education

2020 – 2024 ELTE, Doctoral School of Philosophy, Logic and philosophy of Science Program

2018 – 2020 ELTE, Logic and theory of science, master

2016–2018 ELTE, mathematical logic, honorator status

2016–2018 ELTE, philosophy, minor

2015–2018 ELTE, Classical philology (Ancient Greek, Latin), bachelor

PhD (Logic)

Title: *Ultrafilter extensions and ultrafilter unions in modal and first-order logics*. Eötvös Loránd University (2024).

Mathematical Subject Classification: Primary 03C20, 03B45, Secondary 06E25.

Degrees

MA/MSc Logic and theory of science, qualification: with honors (2020)

BA/BSc Classical Philology, qualification: outstanding (2018)

College for Advanced Studies

2015-2018 Eötvös József Collegium

Conference, seminar talks

Invited Talks.

Apr 2024 Budapest Type Theory Seminar, ELTE, Institute of Informatics. Title: *A quick survey of the basics of algebraic logic. Part II.* (w/ Gábor Sági) <https://bitbucket.org/akaposi/tipuselmelet/src/master>

Conference Talks.

(Logic & mathematics)

- Jan 2024 World Logic Day 6, Pécs, Hungary. Title: *van Benthem characterization theorem for ultrafilter extensions.* <https://conferences.renyi.hu/wld6>
- Jun 2023 Cracow Logic Conference (CLOCK), Cracow, Poland. Title: *Remarks on the ultrafilter extensions with infinite degree.* <https://iphils.uj.edu.pl/~a.trybus/clock>
- Feb 2023 São Paulo School of Advanced Science on Contemporary Logic, Rationality, and Information (SPLogiC), Campinas, Brazil. Title: *Model Theory of Modal Logics: model theoretic connections between first-order and modal logics.* <https://www.cle.unicamp.br/splogic>
- Jan 2023 World Logic Day 5, Budapest, Hungary. Title: *To what extent an ultrafilter extension can be similar to an ultrapower?* <https://conferences.renyi.hu/wld5>
- Aug 2022 Advances in Modal Logic (AiML), Rennes, France. Title: *Bounded ultrafilter extensions and ultrafilter unions are elementary.* <https://aiml2022.irisa.fr>

Seminar Talks.

(Logic & mathematics)

- Nov 2023 Logic and Philosophy of Science Seminar (LPS). Title: *Variations on the ultrafilter extensions - the many different ways.* <http://lps.elte.hu/lps/2023-2024/November>
- Apr 2021 Logic and Philosophy of Science Seminar (LPS). Title: *Ultrafilter extensions and elementary equivalence?* <http://lps.elte.hu/lps/2020-2021/April>
- May 2020 Logic and Philosophy of Science Seminar (LPS). Title: *Stabilization problem in modal logic.* <http://lps.elte.hu/lps/2019-2020/May>
- Nov 2019 Logic and Philosophy of Mathematics Seminar (LaPoM). Title: *Some extensions of $S4.3$.*

Other talks.

(Philosophy and history of mathematics and logic & talks in Hungarian)

Apr 2022 Young Philosophy 2022. Title: *Ultrafilter extension of certain structures are elementary.*

- Feb 2022 *Collision Points IX*. Title: *Some simple properties of ultrafilter unions* (in Hungarian).
- Feb 2021 *Collision Points VIII*. Title: *Investigation of simple modal structures* (in Hungarian).
- Feb 2020 *Collision Points VII*. Title: *Modal logic of limit ordinals* (in Hungarian).
- Sept 2020 *XXI. Eötvös Konferencia*. Title: *Ultrafilter extensions of limit ordinals* (in Hungarian).
- May 2019 *VI. Mathema Konferencia*. Title: *Scientific knowledge in the Posterior Analytcs* (in Hungarian).
- May 2019 *Collision Points VI*. Title: *Aristotle's finite logic in Posterior Analytics* (in Hungarian).
- May 2018 *Byzanz und das Abendland VI*. Title: *The concept of symbebekos in the Sophistical Refutations*.

Publication

Book.

- 2023 Arisztotelész: *Organon. Logikai értekezések*. Gondolat kiadó. Reviewing translation and notes (Topics, Sophistical Refutations).

Papers.

- 2024 A. Banerjee, A. Gopaulsingh, Z. Molnár. Distinguishing chromatic number of middle and subdivision graphs. arXiv preprint: <https://arxiv.org/abs/2411.07000>
- 2024 Z. Molnár. Ultrafilter extensions of bounded graphs are elementary. *Studia Logica*. DOI: <https://doi.org/10.1007/s11225-024-10148-8>
- 2024 A. Banerjee, Z. Molnár, A. Gopaulsingh. Distinguishing colorings, proper colorings, and covering properties without the Axiom of Choice. *Ars Mathematica Contemporanea* (online). <https://doi.org/10.26493/1855-3974.3233.185>
- 2024 A. Banerjee, Z. Molnár, A. Gopaulsingh. Upper bounds for the list-distinguishing chromatic number. arXiv preprint: <https://doi.org/10.48550/arXiv.2405.12733>
- 2024 Z. Gyenis, Z. Molnár. Varieties of modal algebras without the congruence extension property. arXiv preprint: <https://doi.org/10.48550/arXiv.2402.07293>
- 2024 A. Banerjee, Z. Molnár, A. Gopaulsingh. On the Rainbow Ramsey theorem and the Canonical Ramsey Theorem for pairs without AC. arXiv preprint: <https://doi.org/10.48550/arXiv.2401.02215>
- 2023 Z. Gyenis, Z. Molnár, Ö. Öztürk. The Modelwise Interpolation Property of Semantic Logics. *Bulletin of the Section of Logic 52(1)*, 59-83. <https://doi.org/10.18778/0138-0680.2023.09>
- 2022 Z. Molnár, Ö. Öztürk. Notes on localizing Craig's interpolation theorem. *Elpis 15*, 103-116. <https://doi.org/10.54310/Elpis.2022.1.8>

Teaching experience

From 2020 I have been teaching various advanced courses including modal logic, intuitionistic logic, universal algebra, algebraic logic, set theory at the Department of Logic, ELTE. Since 2022 I taught three times Foundations of Mathematics at the Institute of Mathematics, ELTE. The target group of these courses were mathematics undergraduates, as well as students from the Logic and Theory of Science programme with various background including philosophy, physics, computer science, mathematics and linguistics. From 2024 I am also giving introductory logic lectures and seminars at the Institute of Philosophy, ELTE for undergraduates.

Awards, scholarships, research projects

- 2023-2024 New National Excellence Program (ÚNKP). Project title: *Connections between ultrafilter extensions and the van Benthem's Characterization theorem.*
- 2023 Full grant for the *São Paulo School of Advanced Science on "Contemporary Logic, Rationality, and Information"* Conference.
- 2022-2023 New National Excellence Program (ÚNKP). Project title: *Connections between modal structures and atomic BAO's.*
- 2021-2022 New National Excellence Program (ÚNKP). Project title: *Algebraic investigations of modal type logics.*
- 2020-2021 New National Excellence Program (ÚNKP). Project title: *On the possible extensions of Truth Lemma in modal logics.*
- 2020-2024 PhD Scholarship.
- 2019-2020 National Higher Education Scholarship.
- 2019-2020 New National Excellence Program (ÚNKP). Project title: *Modal logic in Philosophy of Science.*
- 2019 Pro Scientia Association's Special Award.
- 2019 Nationwide Students' Research Competition (OTDK), 1st Prize (Philosophy).
- 2018-2019 New National Excellence Program (ÚNKP). Project title: *Application of the Logical Theory in Posterior Analytics.*

Language skills

Hungarian (native), English (fluent), Latin (B2), Ancient Greek (B2)

Computer Skills

Python, Haskell, L^AT_EX