

RESEARCH PROFILE

My research develops categorical frameworks for building expressive reasoning systems that applies to structural problems in mathematics and computer science. I apply the techniques of classifying topos and internal language to study synthetic models of higher categories, guarded recursion, and computability. More recently I'm also exploring AI for advancing math research.

EDUCATION

PhD in Computer Science , University of Cambridge, Cambridge.	2024 - 2027 Exp.
Master of Logic , ILLC, University of Amsterdam, Amsterdam. GPA: 9.32/10.0 (<i>cum laude</i>)	2022 - 2024
BSc in Physics and Mathematics , Tsinghua University, Beijing. GPA: 3.91/4.00 (1st in cohort of 29)	2018 - 2022
Visiting student of Mathematics and Philosophy , University of Oxford, Oxford.	2020 - 2021

PUBLICATIONS

Published/Accepted Journal Articles

Ye, L. <u>Duality Theory for Categorical Theories.</u> To appear in <i>Journal of Symbolic Logic</i> .	2026
Ye, L. <u>Coexact Completion of Profinite Heyting Algebras and Uniform Interpolation.</u> To appear in <i>Review of Symbolic Logic</i> .	2026
Ye, L. <u>Categorical Structure in Coherent Theory of Arithmetic.</u> <i>Theoretical Computer Science</i> .	2026
Grabmayr, B., Halbach, V., Ye, L. <u>Varieties of Self-Reference in Metamathematics.</u> <i>Journal of Philosophical Logic</i> .	2023

Contributed Chapters

Ye, L. <u>Unification of Modal Logic via Topological Categories.</u> In: Master, J., Lewis, M. (eds) <i>Proceedings Fifth International Conference on Applied Category Theory</i> .	2023
Ye, L. <u>Towards a Relational Treating of Language and Logical Systems.</u> In: Liao, B., Wáng, Y. (eds) <i>Context, Conflict and Reasoning</i> . Logic in Asia: Studia Logica Library. Springer, Singapore.	2020

Textbook

Westerståhl, D., **Ye, L.** **Mathematical Logic: Completeness, Incompleteness, Computability.** 2026
Posts & Telecommunications Press (人民邮电出版社), forthcoming (in Chinese).

Preprints/Under Review

- Xu, Y., **Ye, L.** **Failure of Higher-Order Truth Within Intuitionistic Propositional Logic.**
Under review in *Advances in Mathematics*. (This work is obtained in collaboration with AI, and solves a 40-year open problem in categorical logic).
- Di Liberti, I., Tarantino U., **Ye, L.** **Conceptual Completeness For Subgeometric Logics.**
Under review in *American Journal of Mathematics*.
- Bakke, F., Sterling, J., Williams, M., **Ye, L.** **The Synthetic Sierpiński Cone.**
Arxiv 2605.00773.
- Di Liberti, I., **Ye, L.** **Craig Interpolation For Subgeometric Logics.**
Under review in *Journal of Symbolic Logic*.
- Di Liberti, I., **Ye, L.** **Logic and Concepts in the 2-Category of Topoi.**
Under review in *Annals of Pure and Applied Logic*.
- Sterling, J., **Ye, L.** **Domains and Classifying Topoi.**
Under review in *Mathematical Structures in Computer Science*.

Thesis

- Ye, L.** **Algebraic Monoidal Model Categories and Path Category Structures for Effective Kan Fibrations.** 2024
Master thesis. Supervisor: Dr. Benno van den Berg.
- Ye, L.** **A Structural Study of Information in a Logical Perspective.** 2022
Bachelor thesis. Supervisor: Prof. Johan van Benthem and Prof. Fenrong Liu.

TALKS

- Craig Interpolation For Subgeometric Logics.** 2026
Plenary, The International Category Theory Conference (CT 2026), Baltimore.
- Synthetic Quasi-Coherence for Coherent Theories.** 2026
The 112th Peripatetic Seminar on Sheaves and Logic (PSSL 112), Nottingham.
- Intentionality via Universal Property of Arithmetic.** 2024
The 12th Tsinghua Logic Colloquium, Beijing.
- Incompleteness and Intentionality via Universal Property of Arithmetic.** 2024
The 109th Peripatetic Seminar on Sheaves and Logic (PSSL 109), Leiden.
- Stack Representation of First-Order Intuitionistic Theories.** 2024
Logic@GU Research Seminar, Gothenburg.
- Diagonalisation and Well-Founded Naming.** 2023
The 5th New College Logic Meeting, Oxford.
- Categorical Structure in Theory of Arithmetic.** 2023
Structure Meets Power, Boston.
- Unification of Modal Logic via Topological Categories.** 2022
The Fifth International Conference on Applied Category Theory, Glasgow.

AWARDS AND DISTINCTIONS

<u>VvL Master's Thesis Award</u> - Best master's thesis on logic in the Netherlands.	2025
<u>Cambridge International Scholarship</u> .	2024
<u>Amsterdam Merit Scholarship</u> .	2022
<u>Sino-Dutch Scholarship</u> .	2022
<u>Chi-Sun YEH Prize</u> (叶企孙奖) - Top honour for physics undergraduate at Tsinghua University.	2022
<u>Yinghua Scholar</u> - Fully funded visiting studentship at New College, University of Oxford.	2020
Silver Medal for the 34th Chinese National Physics Olympiad.	2017

TEACHING

Advisor , Part II Computer Science Project on Lean Formalisation of Modal Logic.	2026 -
Lecturer , Tsinghua Logic Summer School: <u>Introduction to Categorical Logic</u> .	2025
Supervisor , Cambridge: Denotational Semantics, Computation Theory, Logic and Proof.	2024 -

ACADEMIC SERVICES

Editor : <u>Tsinghua Logic Blog</u> .	2021 -
Referee :	
• Applied Categorical Structures.	
• Annals of Mathematics and Artificial Intelligence.	
• Journal of European Mathematical Society.	
Co-organiser :	
• <u>The Fifth New College Logic Meeting</u> .	2023
• <u>Online Workshop: Logic with Vector Space Models</u> .	2020

OUTREACH

Contributing Writer , Fanpu (返朴) Magazine	2021 -
Regular contributor of expository articles (in Chinese) on logic, mathematics, and theoretical physics. Cumulative reads exceed 180,000.	
Science AAAS Media Internship	2021
Produced and translated scientific news articles and educational media content.	

TECHNICAL SKILLS

Language :	Mandarin (native), English (fluent), French (reading).
Programming :	Mathematica, Python, Lisp, Haskell, Lean, Agda, Rocq, LaTeX.