

# Tobias Fritz

Department of Mathematics  
University of Innsbruck, Austria  
✉ [tobias.fritz@uibk.ac.at](mailto:tobias.fritz@uibk.ac.at)  
🌐 [tobiasfritz.science](https://tobiasfritz.science)  
📄 [scholar.google.com/citations?user=v7BPj94AAAAJ](https://scholar.google.com/citations?user=v7BPj94AAAAJ)

Research I'm a mathematical pioneer with broad interests in foundational questions from physics and computer science. Understanding the mathematical structure of the world is my primary passion.  
Citizenship German

## POSITIONS

2021–now Assistant Professor (tenure-track), Department of Mathematics, University of Innsbruck, Austria.  
2018–2020 Senior Postdoctoral Fellow, Perimeter Institute, Waterloo, Canada.  
2015–2018 Postdoctoral Researcher, Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany.  
Visiting Fellow, Perimeter Institute, Waterloo, Canada.  
2012–2015 Templeton Frontiers Postdoctoral Fellow, Perimeter Institute, Waterloo, Canada.  
2010–2012 Postdoctoral Researcher, Institute of Photonic Sciences, Barcelona, Spain.

## EDUCATION

2010 PhD, Max Planck Institute for Mathematics, Bonn. Adviser: Matilde Marcolli.  
2007 Diplom (Master equivalent) in Mathematics, University of Münster. Adviser: Joachim Cuntz.  
2005 German Academic Exchange Service fellowship, University of Texas at Austin.  
2002–2007 German Academic Scholarship Foundation fellowship.  
2000, 2001 International Physics Olympiad, team of Germany. Awards: bronze/silver medal.

## AWARDS

2022 Austrian Science Fund Stand-Alone Project *Probability and Statistics with Markov Categories*, 280,000 € (rounded).

## PUBLICATIONS

All publications are available as preprints matching the published version at

[arXiv.org/a/fritz\\_t\\_1](https://arxiv.org/a/fritz_t_1).

The following list is in reverse chronological order by completion of the preprint. Coauthors who were students at the time of writing are marked \*\* and postdoc coauthors \*.

### Published or accepted:

- 1) Categories of abstract and noncommutative measurable spaces.  
With Antonio Lorenzin\*.  
*Adv. Math* 488, 110793 (2026). 86 pages.
- 2) Optimizing over iid distributions and the Beat the Average game.  
With Pierre C Bellec.  
To appear in *Amer. Math. Monthly*. 21 pages.
- 3) Hyperdeterminism? Spacetime 'Analyzed'.  
With Lu Chen.  
*Erkenntnis* 91, 1043–1058 (2026).
- 4) The Aldous–Hoover Theorem in Categorical Probability.

- With Leihao Chen\*\*, Tomáš Gonda\*, Andreas Klingler\* and Antonio Lorenzin\*.  
*Algebr. Stat.* 16(2), 131–174 (2025).
- 5) Self-distributive structures in physics.  
*Int. J. Theor. Phys.* 64, 73 (2025). 10 pages.
  - 6) Differential geometry and general relativity with algebraifolds.  
*J. Geom. Phys.* 206, 105327 (2024). 53 pages.
  - 7) Hidden Markov Models and the Bayes Filter in Categorical Probability.  
 With Andreas Klingler\*\*, Drew McNeely\*\*, Areeb Shah-Mohammed\*\* and Yuwen Wang\*.  
*IEEE Trans. Inform. Theory* 71(9), 7052–7075 (2025).
  - 8) Weakly Markov categories and weakly affine monads.  
 With Fabio Gadducci, Paolo Perrone\* and Davide Trotta\*.  
*LIPICs. Leibniz Int. Proc. Inform.* 270(16), 1–17 (2023).
  - 9) Matrix majorization in large samples.  
 With Muhammad Usman Farooq\*\*, Erkka Haapasalo\* and Marco Tomamichel.  
*IEEE Trans. Inform. Theory* 70(5), 3118–3144 (2024).
  - 10) Dilations and information flow axioms in categorical probability.  
 With Tomáš Gonda\*, Nicholas Gauguin Houghton-Larsen\*, Antonio Lorenzin, Paolo Perrone\* and Dario Stein\*.  
*Math. Struct. Comp. Sci.* 33(10), 913–957 (2023).
  - 11) The  $d$ -separation criterion in Categorical Probability.  
 With Andreas Klingler\*\*.  
*J. Mach. Learn. Res.* 24(46), 1–49 (2023).
  - 12) Non-abelian and  $\varepsilon$ -curved homological algebra with arrow categories.  
*J. Pure Appl. Algebra* 227(6), 107314 (2023). 25 pages.
  - 13) Asymptotic and catalytic containment of representations of  $SU(n)$ .  
*Algebr. Comb.* 7(2), 327–336 (2024).
  - 14) From  $gs$ -monoidal to oplax cartesian categories: constructions and functorial completeness.  
 With Fabio Gadducci, Davide Trotta\* and Andrea Corradini.  
*Appl. Categ. Structures* 31, 42 (2023). 31 pages.
  - 15) Free  $gs$ -monoidal categories and free Markov categories.  
 With Wendong Liang\*\*.  
*Appl. Categ. Structures* 31, 21 (2023). 31 pages.
  - 16) An Algebraic Approach to Physical Fields.  
 With Lu Chen.  
*Stud. Hist. Philos. Sci. A* 89, 188–201 (2021).
  - 17) Weak cartesian properties of simplicial sets.  
 With Carmen Constantin\*, Paolo Perrone\* and Brandon Shapiro\*\*.  
*J. Homotopy Relat. Struct.* 18, 477–520 (2023).
  - 18) De Finetti’s Theorem in Categorical Probability.  
 With Tomáš Gonda\*\* and Paolo Perrone\*.  
*J. Stoch. Anal.* 2(4), 6 (2021). 26 pages.

- 19) Representable Markov Categories and Comparison of Statistical Experiments in Categorical Probability.  
With Tomáš Gonda\*\*, Paolo Perrone\* and Eigil Fjeldgren Rischel\*\*.  
*Theoret. Comput. Sci.* 961, 113896 (2023). 67 pages.
- 20) Partial Evaluations and the Compositional Structure of the Bar Construction.  
With Carmen Constantin\*, Paolo Perrone\* and Brandon Shapiro\*\*.  
*Theory Appl. Categ.* 39(11), 322–364 (2023).
- 21) The asymptotic comparison of random walks on topological abelian groups.  
*Bernoulli* 30(4), 2932–2954 (2024).
- 22) Abstract Vergleichsstellensätze for preordered semifields and semirings I.  
*SIAM J. Appl. Algebra Geometry* 7(2), 505–547 (2023).
- 23) The zero-one laws of Kolmogorov and Hewitt–Savage in categorical probability.  
With Eigil Fjeldgren Rischel\*\*.  
*Compositionality* 2, 3 (2020). 24 pages.
- 24) Probability, valuations, hyperspace: Three monads on Top and the support as a morphism.  
With Paolo Perrone\* and Sharwin Rezagholi\*\*.  
*Math. Struct. Comp. Sci.* 31(8), 850–897 (2021).
- 25) A synthetic approach to Markov kernels, conditional independence and theorems on sufficient statistics.  
*Adv. Math.* 370, 107239 (2020). 95 pages.
- 26) The universal property of infinite direct sums in  $C^*$ -categories and  $W^*$ -categories.  
With Bas Westerbaan\*\*.  
*Appl. Categ. Structures* 28, 355–365 (2020).
- 27) A unified construction of semiring-homomorphic graph invariants.  
*J. Algebraic Combin.* 54 (3), 693–718 (2021).
- 28) A generalization of Strassen’s Positivstellensatz.  
*Comm. Algebra* 49(2), 482–499 (2021).
- 29) Antisymmetry of the stochastic order on all ordered topological spaces.  
*Anal. Geom. Metr. Spaces* 7(1), 250–252 (2019).
- 30) Monads, partial evaluations, and rewriting.  
With Paolo Perrone\*\*.  
*Electron. Notes Theor. Comput. Sci.* 352, 129–148 (2020).
- 31) Stochastic order on metric spaces and the ordered Kantorovich monad.  
With Paolo Perrone\*\*.  
*Adv. Math.* 369, 107081 (2020). 49 pages.
- 32) Optimal bounds on the positivity of a matrix from a few moments.  
With Gemma de las Cuevas\* and Tim Netzer.  
*Comm. Math. Phys.* 375, 105–126 (2020).
- 33) Curious properties of free hypergraph  $C^*$ -algebras.  
*J. Operator Theory* 83(2), 423–445 (2020).
- 34) Bimonoidal Structure of Probability Monads.  
With Paolo Perrone\*\*.  
*Electron. Notes Theor. Comput. Sci.* 341, 121–149 (2018).

- 35) A Probability Monad as the Colimit of Spaces of Finite Samples.  
With Paolo Perrone\*\*.  
*Theory Appl. Categ.* 34(7), 170–220 (2019).
- 36) Spectrahedral containment and operator systems with finite-dimensional realization.  
With Tim Netzer and Andreas Thom.  
*SIAM J. Appl. Algebra Geometry* 1(1), 556–574 (2017).
- 37) The Inflation Technique for Causal Inference with Latent Variables.  
With Elie Wolfe\* and Robert W. Spekkens.  
*J. Caus. Infer.* 7, 2 (2019). 46 pages.
- 38) Quantum logic is undecidable.  
*Arch. Math. Logic* 60, 329–341 (2021).
- 39) A Resource Theory for Work and Heat.  
With Carlo Sparaciani\*\* and Jonathan Oppenheim.  
*Phys. Rev. A* 96, 052112 (2017). 20 pages.
- 40) (Almost)  $C^*$ -algebras as sheaves with self-action.  
With Cecilia Flori.  
*J. Noncomm. Geom.* 11(3), 1069–1113 (2017).
- 41) Resource convertibility and ordered commutative monoids.  
*Math. Struct. Comp. Sci.* 27(6), 850–938 (2017).
- 42) A mathematical theory of resources.  
With Bob Coecke and Robert W. Spekkens.  
*Information and Computation* 250, 59–86 (2016).  
Selected for **Computing Reviews 21st Annual Best of Computing**.
- 43) Beyond Bell’s Theorem II: Scenarios with arbitrary causal structure.  
*Comm. Math. Phys.* 341(2), 391–434 (2016).
- 44) A Bayesian characterization of relative entropy.  
With John C. Baez.  
*Theory Appl. Categ.* 29(16), 421–456 (2014).
- 45) All joint measurability structures are quantum realizable.  
With Ravi Kunjwal\*\* and Chris Heunen\*.  
*Phys. Rev. A* 89, 052126 (2014). 6 pages.
- 46) Exploring the Local Orthogonality Principle.  
With Ana Belén Sainz\*\*, Remigiusz Augusiak\*, Jonatan Bohr Brask\*, Rafael Chaves\*, Anthony Leverrier\* and Antonio Acín.  
*Phys. Rev. A* 89, 032117 (2014). 32 pages.
- 47) Quantum theory realises all joint measurability graphs.  
With Chris Heunen\* and Manuel Reyes.  
*Phys. Rev. A* 89, 032121 (2014). 5 pages.
- 48) Compositories and Gleaves.  
With Cecilia Flori\*.  
*Theory Appl. Categ.* 31(33), 928–988 (2016).
- 49) Probabilistic models on contextuality scenarios.

- With Anthony Leverrier\* and Ana Belén Sainz\*\*.  
*EPTCS* 171, 63–70 (2014).
- 50) A Combinatorial Approach to Nonlocality and Contextuality.  
 With Antonio Acín, Anthony Leverrier\* and Ana Belén Sainz\*\*.  
*Comm. Math. Phys.* 334(2), 533–628 (2015).
- 51) Local orthogonality as a multipartite principle for quantum correlations.  
 With Ana Belén Sainz\*\*, Remigiusz Augusiak\*, Jonatan Bohr Brask\*, Rafael Chaves\*, Anthony Leverrier\* and Antonio Acín.  
*Nature Comm.* 4, 2263 (2013). 14 pages.
- 52) Can you compute the operator norm?  
 With Tim Netzer and Andreas Thom.  
*Proc. Amer. Math. Soc.* 142, 4265–4276 (2014).
- 53) Beyond Bell’s theorem: correlation scenarios.  
*New. J. Phys.* 14, 103001 (2012). 32 pages.  
 Selected for the journal’s **Highlights of 2012**.
- 54) On infinite-dimensional state spaces.  
*J. Math. Phys.* 54, 052107 (2013). 9 pages.
- 55) Polyhedral duality in Bell scenarios with two binary observables.  
*J. Math. Phys.* 53, 072202 (2012). 19 pages.
- 56) An entropic approach to local realism and noncontextuality.  
 With Rafael Chaves\*.  
*Phys. Rev. A* 85, 032113 (2012). 12 pages.
- 57) Entropic Inequalities and Marginal Problems.  
 With Rafael Chaves\*.  
*IEEE Trans. Inform. Theory* 59, 803–817 (2013).
- 58) Tight Bell inequalities with no quantum violation from qubit unextendible product bases.  
 With Remigiusz Augusiak\*, Marcin Kotowski\*\*, Michał Kotowski\*\*, Marcin Pawłowski\*, Maciej Lewenstein and Antonio Acín.  
*Phys. Rev. A* 85, 042113 (2012). 14 pages.
- 59) Velocity Polytopes of Periodic Graphs and a No-Go Theorem for Digital Physics.  
*Discrete Math.* 313, 1289–1301 (2013). Corrigendum: *Discrete Math.* 313, 2380 (2013).
- 60) Nonlocality with less Complementarity.  
*Phys. Rev. A* 85, 022102 (2012). 6 pages.
- 61) A Characterization of Entropy in Terms of Information Loss.  
 With John C. Baez and Tom Leinster.  
*Entropy* 2011, 13(11), 1945–1957.
- 62) Hardy’s Non-locality Paradox and Possibilistic Conditions for Non-locality.  
 With Shane Mansfield\*\*.  
*Found. Phys.* 42(5), 709–719 (2012).
- 63) On the axiomatization of convex subsets of Banach spaces.  
 With Valerio Capraro\*.  
*Proc. Amer. Math. Soc.* 141, 2127–2135 (2013).

- 64) Operator system structures on the unital direct sum of  $C^*$ -algebras.  
*Rocky Mountain J. Math.* 44(3), 913–936 (2014).
- 65) Tsirelson’s problem and Kirchberg’s conjecture.  
*Rev. Math. Phys.* 24(5), 1250012 (2012).
- 66) Quantum analogues of Hardy’s nonlocality paradox.  
*Found. Phys.* 41(9), 1493–1501 (2011).
- 67) Quantum correlations in the temporal CHSH scenario.  
*New J. Phys.* 12, 083055 (2010). 16 pages.
- 68) Transition probabilities and measurement statistics of postselected ensembles.  
*J. Math. Phys.* 51, 082105 (2010). 23 pages.
- 69) On the existence of quantum representations for two dichotomic measurements.  
*J. Math. Phys.* 51, 052103 (2010). 23 pages.
- 70) Categories of Fractions Revisited.  
*Morfismos* 15(2), 19–38 (2011).

#### Other publications:

- 71) Homogeneous length functions on groups. arXiv:1801.03908  
*Algebra Number Theory* 12(7), 1773–1786 (2018).  
I was one of six main contributors to this online collaboration (moderated by Terence Tao) with pseudonymous authorship.

#### Preprints:

- 72) Why measurements are made of effects.  
Under review. 21 pages.
- 73) Dynamics from iterated averaging.  
With Nicolás Rivera.  
Under review. 11 pages.
- 74) Empirical Measures and Strong Laws of Large Numbers in Categorical Probability.  
With Tomáš Gonda\*, Antonio Lorenzin\*, Paolo Perrone\* and Areeb Shah-Mohammed\*\*.  
Under review (second round). 69 pages.
- 75) Involutive Markov categories and the quantum de Finetti theorem.  
With Antonio Lorenzin\*.  
Under review (second round). 49 pages.
- 76) Absolute continuity, supports and idempotent splitting in categorical probability.  
With Tomáš Gonda\*, Antonio Lorenzin\*, Paolo Perrone\* and Dario Stein\*.  
Under review (second round). 84 pages.
- 77) Abstract Vergleichsstellensätze for preordered semifields and semirings II.  
Under review (second round). 55 pages.
- 78) Monotone homomorphisms on convolution semigroups.  
With Xiaosheng Mu and Omer Tamuz.  
Under review. 17 pages.

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#### INVITED TALKS

- 2026 Category Theory 2026, Baltimore (ICM 2026 Satellite Conference).
- Proof Systems in Actual Practice: Reasoning and Computation, Dagstuhl.
  - Cohomology in algebra, geometry, physics and statistics seminar (online).
  - Noncommutative Harmonic Analysis and Quantum Information, Oberwolfach.
  - Causal inference: From theory to practice and back again, Isaac Newton Institute Research Program, Cambridge.
- 2025 Edinburgh category theory seminar.
- TENORS Workshop 1, Konstanz.
  - IX International Workshop on Information Geometry, Quantum Mechanics and Applications 2025, ICMAT, Madrid.
  - Joint Mathematics Meetings, Special Session on Categorical Generalizations of Conditionalization, Seattle.
- 2024 Information, Geometry and Physics Seminar, California Institute of Technology.
- Soft Methods in Probability and Statistics, Salzburg.
  - International Workshop on Operator Theory and its Applications, Kent.
  - Algebraic and Combinatorial Perspectives in the Mathematical Sciences Seminar, online.
  - Mathematical Physics Seminar, Regensburg.
  - Algebra Seminar, University of California, Irvine.
- 2023 Complexity Seminar, Czech Academy of Sciences.
- Cohomology in algebra, geometry, physics and statistics seminar (online).
  - Category Theory at Work in Computational Mathematics and Theoretical Informatics, Lie-Størmer Center. Distinguished lecture series.
  - ItaCa Fest (online).
- 2022 Tensors: Quantum Information, Complexity and Combinatorics, Centre de recherches mathématiques. Two talks.
- Inn’formal Probability Seminar, University of Innsbruck.
  - Entanglement in Action, Benasque.
  - Mathematics Seminar, Koç University, Istanbul.
- 2021 Mathematical Foundations of Programming Semantics, Salzburg (hybrid).
- Probabilistic Operator Algebra Seminar, UC Berkeley (online).
  - Categories and Companions Symposium (online).
  - Topos Institute Colloquium (online).
  - Cohomology in algebra, geometry, physics and statistics seminar (online).
  - New York City Category Theory Seminar (online).
- 2020 Metric Geometry and Network Analysis Seminar, Max Planck Institute for Mathematics in the Sciences (online).
- Categories Seminar, National Autonomous University of Mexico (online).
  - Applied Category Theory Seminar, MIT (online).
  - Introduction to Geometric Modelling for Neuroscience, Fields Institute. Minicourse speaker.
- 2019 Physics of Information Seminar, University of Waterloo.
- Symposium on Compositional Structures, Chapman University.
  - Applied Category Theory Seminar, MIT.
  - Analysis Seminar, University of Waterloo.
  - The Future of Mathematics panel discussion, Perimeter Institute.
- 2018 C\*-algebras Seminar, University of Münster.
- Real Algebra and Geometry Seminar, University of Konstanz.
  - Convexity and Quantum Information, Natal.
  - Modern Topics on Quantum Information, Natal.
  - Foundations of Quantum Mechanics, Perimeter Institute.

- Analysis Seminar, University of Waterloo.
- Combining viewpoints in quantum theory, Edinburgh.
- Algebra Seminar, University of Waterloo.
- 2017 Seminar on Algebra, Geometry and Combinatorics, University of Dresden.
  - Topological and geometrical structure of information, Marseille.
  - Real Algebraic Geometry and its Applications, Innsbruck.
  - Hopf Algebras in Kitaev’s Quantum Double Models, Perimeter Institute.
  - Algebra Seminar, University of Greifswald.
- 2016 Compositionality, Simons Institute.
  - Algebra Seminar, University of Innsbruck.
  - Free Probability Seminar, University of Saarbrücken.
  - Philosophy of Physics Seminar, University of Western Ontario.
  - Mathematical Aspects in Current Quantum Information Theory, Daejeon.
- 2015 Analysis Seminar, University of Regensburg.
  - Algebraic topology and information theory, CS-DC’15 World e-conference.
  - Categorical Foundations of Network Theory, Torino.
  - Colloquium, Perimeter Institute.
  - Pure Mathematics Colloquium, University of Western Ontario.
  - Entropy and Information in Biological Systems, Knoxville.
  - Coalgebras in Quantum Physics, Bellairs Research Institute, Barbados.
- 2014 Colloquium, Perimeter Institute.
  - American Physical Society March Meeting, Denver.
- 2013 Causal Structure in Quantum Theory, Benasque.
  - Colloquium, Perimeter Institute.
- 2012 Information Flow and Its Applications, Schloss Dagstuhl.
  - Workshop on Connes’ Embedding Conjecture, Neuchâtel.
  - Operator structures in quantum information theory, Banff International Research Station.
- 2011 Functional Analysis Methods in Quantum Information, EMS-RSME Joint Mathematical Weekend, Bilbao.

## SUPERVISION ACTIVITY

### Postdocs:

- 2025–2027 Tomáš Gonda
- 2022–2024 Antonio Lorenzin

### PhD students:

- 2025– Victor Bloch, Benjamin Engel
- 2024– Alexander Prähauser
- 2022– Areeb Shah-Mohammed
- 2016–2018 Paolo Perrone, official adviser: Jürgen Jost

### MSc students:

- 2025 Victor Bloch, Carolina Eichholz
- 2024 Benjamin Walder
- 2022 Andreas Klingler
- 2021 Wendong Liang

Additionally: 7 BSc/BEd theses (2021–2025) in mathematics and physics.

## TEACHING

Courses and seminars at the Department of Mathematics, University of Innsbruck:

- 2026 Algebra 2 (undergraduate course)
- 2025 Algebra 1 (undergraduate course)
  - History and Philosophy of Mathematics (graduate seminar)
  - Category Theory (graduate course)
- 2024 Algebra 2 (undergraduate course)
  - History and Philosophy of Mathematics (graduate seminar)
- 2023 Algebra 1 (undergraduate course)
  - Higher Algebra and Discrete Mathematics (graduate course)
  - Aspects of Noncommutative Geometry (graduate seminar, joint with Tim Netzer)
- 2022 Lie groups and Lie algebras (graduate course)
  - History and Philosophy of Mathematics (graduate seminar, joint with Tim Netzer)
  - Higher Algebra and Discrete Mathematics (graduate course)
- 2021 Category Theory (graduate course)
  - Algebra 2 (undergraduate course)
- 2020 Algebra 1 (undergraduate course)

Previous:

- 2019 Partial evaluations, the bar construction, and second-order stochastic dominance (online course for Applied Category Theory 2019 School, joint with Paolo Perrone)
- 2016 Geometry in Physics (block course at CdE MultiAkademie)
  - Discrete Structures (graduate course within MPI MIS PhD program, joint with Peter Stadler and Jürgen Jost)
  - Categories in Algebra and Geometry (graduate course within MPI MIS PhD program)
- 2015 Computer experiments with artificial life (block course at CdE WinterAkademie)
- 2014 Type-theoretic foundations of mathematics (block course at CdE WinterAkademie)
  - Homotopy Type Theory and Univalent Foundations (graduate course, Department of Pure Mathematics, University of Waterloo, joint with Cecilia Flori)

## REFEREING AND EDITORIAL SERVICE

2019–current Founding editor of *Compositionality* (applied category theory journal).

Refereeing of books for:

- Cambridge University Press,
- World Scientific Publishing Co.

Refereeing of journal articles (not counting reports on resubmissions) for:

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| <ul style="list-style-type: none"> <li>○ <i>Adv. Math.</i>,</li> <li>○ <i>AIMS Math.</i>,</li> <li>○ <i>Arch. Math. (Brno)</i>,</li> <li>○ <i>Boll. Unione Mat. Ital.</i>,</li> <li>○ <i>Cah. Topol. Géom. Différ. Catég.</i>,</li> <li>○ <i>Class. Quant. Grav.</i>,</li> <li>○ <i>Comm. Algebra</i>,</li> <li>○ <i>Comm. Math. Phys.</i> (4x),</li> <li>○ <i>Compositionality</i> (3x),</li> <li>○ <i>Discrete Math.</i>,</li> <li>○ <i>Elect. Proc. Theo. Comp. Sci.</i>,</li> <li>○ <i>Entropy</i> (4x),</li> <li>○ <i>IEEE Trans. Inform. Theory</i> (2x),</li> <li>○ <i>Indiana Univ. Math. J.</i>,</li> <li>○ <i>Inf. Geom.</i>,</li> </ul> | <ul style="list-style-type: none"> <li>○ <i>Int. Math. Res. Not. IMRN</i>,</li> <li>○ <i>J. Econom. Theory</i>,</li> <li>○ <i>J. Mach. Learn. Res.</i>,</li> <li>○ <i>J. Math. Phys.</i>,</li> <li>○ <i>J. Phys. A</i> (3x),</li> <li>○ <i>J. Pure Appl. Algebra</i>,</li> <li>○ <i>Kybernetika</i>,</li> <li>○ <i>Lett. Math. Phys.</i>,</li> <li>○ <i>Log. Methods Comput. Sci.</i>,</li> <li>○ <i>Math. Struct. Comp. Sci.</i>,</li> <li>○ <i>New J. Phys.</i>,</li> <li>○ <i>Oper. Matrices</i>,</li> <li>○ <i>Order</i>,</li> <li>○ <i>Phys. Rev. Lett.</i>,</li> <li>○ <i>Quantum</i> (2x),</li> </ul> |
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- *RACSAM*,<sup>1</sup>
- *SIAM J. Appl. Algebra Geom.*,
- *SIGMA*,<sup>2</sup>
- *Theory Appl. Categ.* (3x),
- *Trans. Amer. Math. Soc.* (2x).

Refereeing of proceedings articles for:

- *Logic in Computer Science* (2022, 2026),
- *9th International Conference on Algebra and Coalgebra in Computer Science* (2021),
- *Principles and Practice of Declarative Programming* (2020),
- *IEEE International Symposium on Information Theory* (2019),
- *Information Geometry and its Applications IV* (2016),
- *Quantum Physics and Logic* (2014).

Program committee memberships:

- *Applied Category Theory* (2019–2021, 2025),
- *4th Symposium on Compositional Structures* (2019),
- *Quantum Physics and Logic* (2015).

Reviewing activity:

- *Mathematical Reviews* (35 reviews),
- *zbMATH* (18 reviews).

Grant reviewing for:

- *European Research Council (ERC)*.

PhD committee memberships:

- 2025 Dávid Bugár, Budapest University of Technology and Economics (mathematics).
- 2023 Alessandro di Giorgio, University of Pisa (computer science).
  - Ruben van Belle, University of Edinburgh (mathematics).
- 2021 Nicholas Gauguin Houghton-Larsen, University of Copenhagen (mathematics).

MSc committee memberships:

- 2024 Maximilian Illmer, University of Innsbruck (mathematics).
  - Benjamin Engel, University of Innsbruck (physics).
  - Matthias Ye Ruijie, University of Innsbruck (mathematics).
- 2023 Julia Bierent, University of Lausanne (mathematics).

## CONFERENCE AND SEMINAR ORGANIZATION

- 2020 *Categorical Probability and Statistics*, online workshop organization. Joint with Rory Lucyshyn-Wright.
- 2017–2018 *LikBez Seminar* organization, Max Planck Institute for Mathematics in the Sciences. Joint with Paolo Perrone and Rostislav Matveev.
- 2014–2015 *Postdoc Lunch* seminar organization, Perimeter Institute. Joint with Matteo Smerlak.

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<sup>1</sup>*Rev. R. Acad. Cienc. Exactas Fís. Nat. Ser. A Mat.*

<sup>2</sup>*Symmetry Integrability Geom. Methods Appl.*