Luca San Mauro, PhD

Curriculum Vitae

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Contacts

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Area of research

Logic, Computability, Philosophy of Mathematics

Employment

10/2023-ongoing	**Assistant professor** (RTD-B), Department of Philosophy, University of Bari
12/2022–12/2023	**Research fellow**, Institute of Discrete Mathematics and Geometry, TU Wien
10/2021–03/2023	**Research fellow**, Department of Mathematics, Sapienza University of Rome
04/2022–03/2024	**Adjunct professor**, Department of Philosophy, University of Bari
10/2018–09/2021	**Adjunct professor**, Department of Cognitive Sciences, University of Siena
04/2018–11/2020	**Lise Meitner fellow**, Institute of Discrete Mathematics and Geometry, TU Wien
03/2016–03/2018	**Postdoctoral fellow**, Institute of Discrete Mathematics and Geometry, TU Wien

Qualifications

07/2020	**Italian Scientific Habilitation** to be **Associate Professor** of *Mathematical Logic* (01/A1)
01/2020	**Italian Scientific Habilitation** to be **Associate Professor** of *Logic and Philosophy of Science* (11/C2)

Education

2011–2016	**PhD (with distinction)** in Philosophy, Scuola Normale Superiore in Pisa Dissertation title: "Informal proofs and computability" Supervisors: G. Lolli (SNS), A. Sorbi (University of Siena)

2008–2011	**Master's degree (with distinction)** in Philosophy, University of Siena Supervisors: A. Sorbi, D. Pianigiani
2005–2008	**Bachelor's degree (with distinction)** in Philosophy, University of Bologna Supervisor: G. Corsi

Publications

Journal articles

27. **Investigating the computable Friedman-Stanley jump**
(with U. Andrews)
Journal of Symbolic Logic, 89(2), 918–944, 2024

26. **How to make (mathematical) assertions with directives**
(with L. Caponetto and G. Venturi)
Synthese, 202, 127, 2023

25. **Classifying word problems of finitely generated algebras via computable reducibility**
(with V. Delle Rose and A. Sorbi)
International Journal of Algebra and Computation, 33(4), 751–768, 2023

24. **Learning algebraic structures with the help of Borel equivalence relations**
(with N. Bazhenov and V. Cipriani)
Theoretical Computer Science, 951, 113762, 2023

23. **How to approximate fuzzy sets: Mind-changes and the Ershov hierarchy**
(with N. Bazhenov, M. Mustafa, and S. Ospichev)
Synthese, 201, 55, 2023

22. **Thin objects are not transparent**
(with M. Plebani and G. Venturi)
Theoria, 89(3), 314–325, 2023

21. **On the structure of computable reducibility on equivalence relations of natural numbers**
(with U. Andrews and D. Belin)
Journal of Symbolic Logic, 88(3), 1038–1063, 2023

20. **Primitive recursive equivalence relations and their primitive recursive complexity**
(with N. Bazhenov, K. M. Ng, and A. Sorbi)
Computability, 11(3/4), 187-221, 2022

19. **The category of equivalence relations**
(with V. Delle Rose and A. Sorbi)
Algebra and Logic, 60(5), 295–307, 2021

18. **On the Turing complexity of learning finite families of algebraic structures**
(with N. Bazhenov)
Journal of Logic and Computation, 31(7),1891–1900, 2021

17. **On logicality and natural logic**
(with S. Pistoia-Reda)
Natural Language Semantics, 29, 501–506, 2021

16. **Degrees of bi-embeddable categoricity**
(with N. Bazhenov, E. Fokina, and D. Rossegger)
Computability, 10(1), 1–16, 2021

15. **Speech acts in mathematics**
(with M. Ruffino and G. Venturi)
Synthese, 198, 10063–10087, 2021

14. **What is to believe in a mathematical assertion?**
(with G. Venturi)
Italian Journal of Philosophy of Language, 15(1), 154–157, 2021

13. **Word problems and ceers**
(with V. Delle Rose and A. Sorbi)
Mathematical Logic Quarterly, 66(3), 341–354, 2020

12. **Learning families of algebraic structures from informant**
(with N. Bazhenov and E. Fokina)
Information and Computation, 275, 104590, 2020

11. **Classifying equivalence relations in the Ershov hierarchy**
(with N. Bazhenov, M. Mustafa, A. Sorbi, and M. Yamaleev)
Archive for Mathematical Logic, 59(7/8), 835-864, 2020

10. **Minimal equivalence relations in hyperarithmetical and analytical hierarchies**
(with N. Bazhenov, M. Mustafa, and M. Yamaleev)
Lobachevskii Journal of Mathematics, 41, 145–150, 2020

9. **At least one black sheep: Pragmatics and the language of mathematics**
(with M. Ruffino and G. Venturi)
Journal of Pragmatics, 160, 114–119, 2020

8. **Bi-embeddability spectra and bases of spectra**
(with E. Fokina and D. Rossegger)
Mathematical Logic Quarterly, 65(2), 228–236, 2019

7. **Measuring the complexity of reductions between equivalence relations**
(with E. Fokina and D. Rossegger)
Computability, 8(3/4), 265–280, 2019

6. **Degrees of bi-embeddable categoricity of equivalence structures**
(with N. Bazhenov, E. Fokina, and D. Rossegger)
Archive for Mathematical Logic, 58(5/6), 543–563, 2019

5. **Trial and error mathematics: Dialectical systems and completions of theories**
(with J. Amidei, U. Andrews, D. Pianigiani, and A. Sorbi)
Journal of Logic and Computation, 29(1), 157–184, 2019

4. **Computable bi-embeddable categoricity**
(with N. Bazhenov, E. Fokina, and D. Rossegger)
Algebra and Logic, 57(5), 392–396, 2018

3. **Trial and error mathematics II: Dialectical sets and quasidialectical sets, their degrees, and their distribution within the class of limit sets**
(with J. Amidei, D. Pianigiani and A. Sorbi)
Review of Symbolic Logic, 9(4), 810–835, 2016

2. **Trial and error mathematics I: Dialectical and quasidialectical systems**
(with J. Amidei, D. Pianigiani, G. Simi, and A. Sorbi)
Review of Symbolic Logic, 9(2), 299–324, 2016

1. **Universal computably enumerable equivalence relations**
(with U. Andrews, S. Lempp, J. S. Miller, K. M. Ng, and A. Sorbi)
Journal of Symbolic Logic, 79(1), 60–88, 2014

Book chapters and conference papers

13. **Comparing the isomorphism type of equivalence structures and preorders**
(with N. Bazhenov)
Proceedings of the 16th Asian Logic Conference, to appear

12. **Calculating the mind-change complexity of learning algebraic structures**
(with N. Bazhenov and V. Cipriani)
in U. Berger, J. Franklin, F. Manea, and A. Pauly (eds.), *CiE 2022: Revolutions and Revelations in Computability*, Springer (LNCS 13359), 1–12, 2022

11. **Computability theory as a philosophical achievement**
(with M. Plebani)
Clinical Chemistry and Laboratory Medicine, 60(12), 1862–1866, 2022

10. **Approximating approximate reasoning: Fuzzy sets and the Ershov hierarchy**
(with N. Bazhenov, M. Mustafa, and S. Ospichev)
in S. Ghosh and T. Icard (eds.), *LORI 2021: Logic, Rationality, and Interaction*, Springer (LNCS 13039), 1–13, 2021

9. **On the computational content of the theory of Borel equivalence relations**
(with N. Bazhenov, B. Monin, and R. Zamora)
Oberwolfach Preprints, OWP 2021(06), 2021

8. **Limit learning equivalence structures**
(with E. Fokina and T. Kötzing)
Proceedings of Machine Learning Research, 98, 383–403, 2019

7. **Ragionare per reclutare: la logica nei (e dei) convegni pubblici**
(with A. Averardi)
Convegno Annuale Associazione Italiana Professori di Diritto Amministrativo, 2019

6. **Church-Turing thesis, in practice**
in M. Piazza and G. Pulcini (eds.), *Truth, Existence and Explanation*, Springer, 225–248, 2018

5. **Direzioni della logica in Italia: la teoria (classica) della ricorsività**
(with P. Cintioli and A. Sorbi)
in H. Hosni, G. Lolli, C. Toffalori (eds.), *Le direzioni della ricerca logica in Italia 2*, Edizioni ETS, 195–234, 2018

4. **Degree spectra of structures with respect to the bi-embeddability relation**
(with E. Fokina and D. Rossegger)
Proceedings of the 11th Panhellenic Logic Symposium, 32–38, 2017

3. **Computable bi-embeddable categoricity of equivalence structures**
(with N. Bazhenov, E. Fokina, and D. Rossegger)
Proceedings of the 11th Panhellenic Logic Symposium, 126–132, 2017

2. **Reducibility and bi-reducibility spectra of equivalence relations**
(with E. Fokina and D. Rossegger)
Proceedings of the 11th Panhellenic Logic Symposium, 83–89, 2017

1. **Naturalness in mathematics**
(with G. Venturi)
in G. Lolli, M. Panza, and G. Venturi (eds.), *From Logic to Practice*, Springer, 277–313, 2015

Submitted for publication

5. **Punctual presentability in certain classes of algebraic structures**
(with D. Kalociński and M. Wrocławski)

4. **Analogues of the countable Borel equivalence relations in the setting of computable reducibility**
(with U. Andrews)
3. **Classical learning paradigms and algebraic structures**
(with N. Bazhenov, V. Cipriani, S. Jain, and F. Stephan)
2. **Computable paradoxes**
(with M. Plebani and L. Rossi)
1. **Buridan's cell**
(with L. Ferrone)

Talks (selection)

Invited talks

07/2024	**A new way of classifying word problems** *AMS-UMI International Joint Meeting* (special session on Computability Theory) University of Palermo
05/2024	**On the learning power of equivalence relations** *ASL North American Meeting 2024* (special session on Computability Theory) Iowa State University
05/2024	**Exploring the learning power of Borel equivalence relations** *Equivalences, Numberings, Reducibilities 2024* Nazarbayev University, Astana
01/2023	**Learning the intended model of arithmetic** *Torino-Pisa-Konstanz* workshop, University of Kostanz
01/2023	**Settling algebraic questions with logic** *World Logic Day 2023*, Nazarbayev University, Astana
11/2022	**Effectivizing the theory of Borel equivalence relations** *Midwest Computability Seminar* University of Chicago
09/2022	**Learning mathematical structures** *Logic and Philosophy of Mathematics* workshop Scuola Normale Superiore, Pisa
09/2022	**A computable analog of the theory of Borel equivalence relations** *AILA Meeting 2022* University of Campania
07/2022	**Classifying equivalence relations on the natural numbers** *Latin American Symposium on Mathematical Logic 2022* University of Costa Rica
06/2022	**Computable reductions of equivalence relations** *Logic Colloquium 2022* (tutorial) Reykjavik University
03/2021	**Classifying word problems** *Computability Theory and Applications Online Seminar*
12/2020	**Revisiting the complexity of word problems** *Torino-Udine Logic Seminar*

06/2020 **Word problems and ceers**
Reverse mathematics, numberings, and equivalence relations workshop

06/2020 **Learning algebraic structures**
Computability in Europe 2020 (special session on Algorithmic Learning Theory)
University of Salerno

02/2020 **Beyond isomorphism: The interplay between structures and computation**
Structuralist Foundations workshop
University of Vienna

12/2019 **The global structure of degrees of equivalence relations**
Workshop on Digitalization and Computable Models 2019
Novosibirsk State University

12/2019 **The complexity of punctual equivalence relations**
Studies in Mathematical Logic workshop
University of São Paulo

06/2019 **Computable reducibility and its variants**
Computability, Complexity, and Randomness 2019
Nazarbayev University, Astana

09/2016 **Trial and error mathematics**
17th Logic Workshop: Computation – Arithmetics – Cognition (tutorial)
Checiny, Poland

Invited participations

10/2023 *Recursion Theory and its Applications* workshop, Institute for Advanced Study in Mathematics, Hangzhou

01/2018 *Computability Theory* workshop, Oberwolfach Research Institute for Mathematics

Contributed talks

44 contributed talks given at international meetings, including several editions of *Logic Colloquium*, *Computability in Europe*, and *Computability, Complexity and Randomness*

Seminar talks given at the following universities

Sapienza University of Rome, University of Udine, University of Florence, University of Chieti-Pescara, University of Turin, University of Konstanz, University of Padua, University of Wisconsin-Madison, University of Pavia, Scuola Normale Superiore in Pisa, Sobolev Institute of Mathematics (Novosibirsk), Vita-Salute San Raffaele University (Milan), Hasso Plattner Institute (Potsdam), University of Campinas, University of Bologna, University of Urbino, University of Buenos Aires

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Projects, grants, and awards

Research projects

2022–2026 Project lead of **A new way of classifying algorithmic problems in algebra**
Funded by the Austrian Science Fund with €345,408.00

2020–2022 Team member of **Positive graphs as mathematical models of databases**
(project lead: B. Kalmurzayev and S. Badaev)
Funded by the Kazakh National Scientific Council

02/2020	Team member of **The computational content of the theory of Borel equivalence relations** (with N. Bazhenov, B. Monin, and R. Zamora) Funded by the Oberwolfach Research Institute for Mathematics, within the program *Research in Pairs*
2019–2021	Team member of **Effective properties of algebraic structures** (project lead: A. Soskova) Funded by the Bulgarian National Science Fund
2019–2021	Team member of **Illocutionary acts in mathematics** (project lead: M. Ruffino) Funded by São Paulo Research Foundation
2018–2020	Project lead of **Classifying relations via computable reducibility** Funded by the Austrian Science Fund with €156,140.00
2016–2018	Project assistant of **Equivalence Relations in Computable Model Theory** (project lead: E. Fokina) Funded by the Austrian Science Fund
2014–2015	Six month fellowship for the project **The role of informal proofs in mathematics** Funded by Scuola Normale Superiore

Awards

2022	Winner of **Paolo Gentilini Prize 2022**, awarded by the Italian Association of Logic and its Applications (AILA) to a young distinguished researcher in mathematical logic
2021	Special mention of **Paolo Gentilini Prize 2021**

Other grants

2015	Association for Symbolic Logic Travel Grant for *Logic Colloquium 2015* and *SLS Summer School in Logic 2015*, Helsinki
2012	Participation grant for the *MidAtlantic Mathematical Logic Seminar*, Deerfield, Florida
2010–2013	Participation grant at *AILA Summer School of Logic*

Research visits (selection)

11/2022	Department of Mathematics, University of Wisconsin–Madison (2 weeks)
03/2022	Department of Philosophy, University of Kostanz (2 weeks)
12/2019	Department of Philosophy, University of Campinas (2 weeks)
09/2019	Department of Mathematics, University of Wisconsin–Madison (3 weeks)
05/2019	School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore (4 weeks)
10/2018	Department of Information Engineering and Mathematics, University of Siena (4 weeks)
06/2018–07/2018	Sobolev Institute of Mathematics, Novosibirsk (5 weeks)
06/2018	Department of Mathematics of Nazarbayev University, Astana (2 weeks)
05/2018	Hasso Plattner Institute, University of Potsdam (1 week)

10/2017	Centre of Logic and Epistemology, University of Campinas (3 weeks)
11/2016	Department of Information Engineering and Mathematics, University of Siena (3 weeks)
01/2013–06/2013	Department of Computer Science, University of Buenos Aires (participation to the *Semester in Computability, Complexity and Randomness*)

Teaching and mentoring

Courses given at the following universities

Department of Philosophy, University of Bari:

Summer 2022–2024	**Logic and philosophy of science**

Master in Philosophy, Politics, and Economics, University of Bari:

Summer 2023, 2024	**Logic and theory of argumentation**

Department of Mathematics, University of Namibia:
(within the program *Mentoring African Research in Mathematics*)

Winter 2021	**Algorithmic learning theory**
Summer 2021	**Computability theory**

Department of Mathematics, TU Wien:

Summer 2020	**Advanced mathematical logic**
Summer 2017–2020	**Computability theory**

Department of Social and Cognitive Sciences, University of Siena:

Winter 2020	**Logic and cognition**
Winter 2018–2020	**Logic**
Winter 2019, 2020	**First order logic**

Mentoring

2022–ongoing	(with E. Fokina) M. Ritter's PhD, TU Wien
2023	A. Pires, Master thesis: "The induction and undetermination problems", University of Bari
2020–2023	(with A. Marcone) V. Cipriani's PhD: "Many problems, different frameworks", University of Udine
2020	V. Polo, Master thesis: "The paradoxes of material implication", University of Siena
2019	V. Cipriani, Master thesis: "Algorithmic learning of computable structures", TU Wien/University of Camerino

Events

09/2024	(Scientific Committee) **AILA Meeting 2024** University of Udine
10/2023	(Program Committee) **Workshop on Digitalization and Computable Models 2023** Nazarbayev University, Astana
09/2023	(Scientific Committee) **1st Conference of the European Society for the Philosophy of Mathematics**, King's College London
07/2023	(Chair) **New Directions in Philosophy of Computability Theory** Symposium for the *17th International Congress on Logic, Methodology and Philosophy of Science and Technology*, University of Buenos Aires
11/2022 – 05/2023	(Co-organizer) **Sapienza LoC3 Seminar** Talk series on recent work in logic, complexity, combinatorics, and computability, Sapienza University of Rome
11/2022	(Co-organizer) **Invariant Descriptive Computability Theory** Workshop hosted by the *American Institute of Mathematics*
09/2022	(Steering Committee) **Foundations, Definitions, and Axioms** *FilMat Conference 2022*, IUSS Pavia
06/2021	(Chair) **Equivalences, Numberings, Reducibilities** Satellite conference of the *8th European Congress of Mathematics*
07/2017, 07/2019	(Scientific Committee) **FilMat Graduate Conference**
12/2018	(Co-organizer) **Illocutionary acts in mathematics** Symposium for the *9th Conference of the Spanish Society for Logic*, UNED Madrid
Winter 2018	(Co-organizer) **An introduction to computable model theory** Reading seminar for Master students of Mathematics and Computer Science of TU Wien
08/2015, 08/2016	(Organizer) **PHD-AILA Graduate Conference**
05/2014	(Scientific Committee) **Objectivity, Cognition, and Proof** *FilMat Conference 2014*, Vita-Salute San Raffaele University
04/2014	(Local Committee) **AILA Meeting 2014** Scuola Normale Superiore, Pisa

Dissemination (in Italian)

12/2021 – ongoing	Collaboration with *Dopolavoro matematico*, a large initiative promoted by the Municipality of Rome for the dissemination of mathematical knowledge to the citizens
02/2024	"Come giocare a pictionary con le strutture algebriche", an outreach leacture on algorithmic learning theory for the International Day of Mathematics, University of Bari
01/2024	"Una scampagnata logica", a day of outreach activities on a range of logical topics for the World Logic Day 2024, University of Bari
06/2023	"Sotto la superficie del linguaggio matematico", an outreach lecture on the pragmatics of mathematical language within the *Festival "Treccani" della Lingua Italiana 2023*

01/2023	"Strutture e tacchini", an outreach lecture on inductive inferences for the World Logic Day 2023, Libreria Tomo, Roma
04/2022	A lighthearted interview on the concept of infinity for the radio show "Le ripetizioni", broadcast on Rai Radio 3
03/2021, 03/2022	"Verità accessibili dal proprio divano", introductory lectures on logic for undergraduates of all disciplines, University of Siena
Spring 2020	Collaboration with *Maturadio*, a series of podcasts broadcast by Rai Radio 3, covering many high-school topics for students preparing the graduation exams during the Covid-19 outbreak

Service to the field

Professional affiliations

2023–2026	(Council member) *Associazione Italiana di Logica e sue Applicazioni*
2023–ongoing	(Editorial board) *Journal for the Philosophy of Mathematics*
2023–ongoing	(Scientific board) *Maddmaths!*
2021–2023	(Scientific collaborator) Centre for Logic, Epistemology and the History of Science (CLE), University of Campinas
2014–2017	(Junior council member) *Associazione Italiana di Logica e sue Applicazioni*
2012 – ongoing	(Promoting committee member) *Italian Network for Philosophy of Mathematics*
2012 – ongoing	(Member) *Association for Symbolic Logic* and *Computability in Europe*

Reviewer

2015 – ongoing	*Journals*: Mathematical Reviews, Asian-European Journal of Mathematics, Computability, Erkenntnis, International Journal of Algebra and Computation, Journal of Logic and Computation, Journal of Symbolic Logic, Logic Journal of the IGPL, Logique et Analyse, Manuscripto, Tsinghua Science and Technology, Analytical and Philosophical Explanation *Conference proceedings*: Computability in Europe, Aspects of Computation, Conference on Automated Deduction *Funding agencies*: Belgium National Fund for Scientific Research, National Science Centre of Poland *Prizes*: SILFS Prize for Women in Logic and the Philosophy of Science 2024, Paolo Gentilini Prize 2024

Language knowledge

Italian	Native
English	Fluent
French	Intermediate