


Luca Spada

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Biographical data Born on the 11th of September, 1979. Unmarried, two daughters. |

Nationality Italian.

ACADEMIC CAREER

Positions

May 2016 - Present **Associate Professor of Mathematical Logic** at the Department of Mathematics of the University of Salerno.

March 2012 - April 2016 **Assistant Professor** at the Department of Mathematics of the University of Salerno.

August 2013 - July 2015 **Marie Curie Fellow** at the ILLC of the University of Amsterdam.

April 2009 - March 2012 **Post-Doc** at the Department of Mathematics of the University of Salerno.

July 2008 - March 2009 **Post-Doc** at the Institut für Diskrete Mathematik und Geometrie of the Technische University of Vienna.

December 2006 - December 2007 **Post-Doc** at the Department of Mathematics and Computer Science of the University of Salerno.

October 2002 - December 2006 **Ph.D. student** in Mathematical Logic and Theoretical Computer Science at the University of Siena.

Studies

29th June 2007 **Ph.D.** in Mathematical Logic and Computer Science at the University of Siena.

Thesis: Fixed points in many-valued logic.

Supervisor: **prof. Franco Montagna.**

15th October 2004 **Master** in Mathematical Logic and Computer Science issued by the Graduate College S.ta Chiara, Siena

1st October 2002 **Degree in Mathematics** at the University of Siena

Score: 110/110 *cum laudæ*

Thesis: Continuous extensions of Łukasiewicz Logic

Supervisor: **prof. Franco Montagna.**

RESEARCH ACTIVITIES

Research statement

The research activities of L.S. focus on **many-valued logics**, in particular Łukasiewicz logic, and related fields. The main mathematical tools used in these investigations come from **mathematical logic, algebra, topology, functional analysis, category theory and piece-wise linear geometry**. L.S.'s main contributions are described below in reverse chronological order.

In 1980 K. R. Goodearl and D. E. Handelman provided a functional representation of **norm complete ℓ -groups**, i.e., Abelian groups which carry a lattice order compatible with the operations and are endowed with an order unit that allows to define a *norm* inside the group. In the working paper [26], together with M. Abbadini and V. Marra, the representation by Goodearl and Handelman was vastly generalised into a categorical duality. The result is to the effect that the category of norm complete ℓ -groups with their homomorphisms is dually equivalent to the class of compact Hausdorff spaces endowed with a *weight map* ranging in \mathbb{N} that satisfy a separation property called arithmetic normality; the appropriate morphisms are continuous functions that respect the weight map. Remarkably, this duality subsumes previous classical results in functional analysis such as **I. M. Gelfand's duality for commutative C^* -algebras**, **S. Kakutani and K. Yosida's duality for Riesz spaces** (by restricting to spaces in which the weight function is constantly 0) as well **M. Stone's duality** for Boolean algebras (by requiring in addition the space to be totally disconnected). One of the main tools proved in the paper is an ℓ -group version of the classical **Stone-Weierstrass Theorem** that characterises the norm completions of an arbitrary ℓ -subgroup of weight preserving continuous functions on an arithmetic normal space. In addition, in the same paper, the authors prove that the category of norm complete ℓ -groups is equivalent to a category of **equationally definable** algebras. This result is in sharp contrast with the fact that the concept of *convergence* as well as the one of *order unit* are in general non first-order definable.

In [27] L. S. together with A. Di Nola and G. Lenzi, investigated Riesz spaces using tools from universal algebra and sheaf theory. They prove that Riesz spaces with an order unit can be represented both as the algebras of global sections of a sheaf of linearly ordered Riesz spaces over a spectral space and as the algebras of global sections of a sheaf of local Riesz spaces over an arbitrary compact Hausdorff space.

The theme of categorical duality is recurrent in L. S.'s recent research. The paper [1], coauthored with O. Caramello and V. Marra, gives a general framework that encompasses many important dualities in mathematics, like the ones by **Pontryagin, Gelfand, Priestley, Stone, Backer and Beynon**. Notably, such a framework is a natural generalisation of the classical dual adjunction in algebraic geometry between k -algebras and affine varieties. In one direction, this framework provides a general machinery that goes beyond classical structures including **topos-theoretic** interesting theories like all presheaf type theories; in another direction, when specialised to the case of equationally definable class of structures, it enables connections with other interesting parts of mathematics. More specifically, it is shown that **Hilbert's Nullstellensatz** can be generalised, in one of its form, to any equationally definable class of algebras and that **Birkhoff's subdirect representation Theorem** can be extended also to non finitary languages, provided that the class of algebras is completely fixed by the aforementioned adjunction.

The general framework described above was inspired by the rich geometric structure of MV-algebras (the algebraic semantics of Łukasiewicz logic). Indeed, in [7] together with V. Marra, L. S. proved that there exists a dual adjunction between the category of Tychonoff spaces with definable maps and the category MV-algebras. The adjunction specialises into an equivalence, when restricted to semisimple MV-algebras. Furthermore, if restricted to finitely presented MV-algebras, the adjunction provides a dual equivalence between the former category and the category of **rational polyhedra** with **piecewise linear maps** with **integer coefficients** between them.

The duality for finitely presented MV-algebras proved in [7], was used to solve a ten year old conjecture by W. Dzik on the unification type of Łukasiewicz logic. Roughly, the unification type of a theory estimates how easy is to parametrise the solutions of a given set of equations. Surprisingly, Łukasiewicz logic has the worst possible unification type. This was proved in [6]. The proof requires, in addition to the aforementioned duality, the fundamental theorem of algebraization through projective algebras of the syntactic notion of unification established by S. Ghilardi in 1997, profound recent results on the projective MV-algebras by L. Cabrer and D. Mundici, and the classical theory of **universal coverings** of sufficiently connected topological spaces.

L. S.'s research interests are not limited to Łukasiewicz, in [2] together with J. Gil-Férez, C. Tsınakis and H. Zhou, L. S. presented a systematic study of **join-extensions and join-completions of ordered algebras**, which naturally leads to a refined and simplified treatment of fundamental results and constructions in the theory of ordered structures ranging from properties of the Dedekind-MacNeille completion to the proof of the **Finite Embeddability Property** for a number of varieties of ordered algebras. The paper investigates also the relationships, in the case of ordered algebras, among several related notions, such as **finite model property**, residual finiteness, and the **word problem**. Again, closely related to the field of many-valued logic, but beyond the realm of Łukasiewicz logic, L. S., together with N. Bezhanishvili and N. Galatos, introduced a method for axiomatising all subvarieties of k -potent integral residuated lattices. The method is inspired by the studies in **intuitionistic logic** carried out between 1960 and 1990 by D. De Jongh, K. Fine, V. Jankov, M. Zakharyashev and others. More strictly related to Łukasiewicz logic are the works [10], [11] and [13]. The first, written with A. Di Nola and G. Lenzi, contains a **uniform version of the celebrated Di Nola's theorem**, that enables to embed all MV-algebras of bounded cardinality into a single algebra of functions taking values in the unital interval of the **non-standard real numbers**. The second, coauthored with A. Di Nola and R. Grigolia, provides a representation of free MV-algebras as direct limits, indexed by n , of the free MV^n -algebras, the latter being the algebraic counterpart of the Łukasiewicz logic with at most n truth values. The third concerns **first order** Łukasiewicz logic. In this area L. S.'s most important achievement was the introduction of a model theoretic forcing for Łukasiewicz logic. The number of positive results stemming from this new tool is in strong contrast with an old result by Scarpellini showing the undecidability of the standard tautologies of this logic.

Another research area on which L. S. had extensively worked are expansions of many-valued logics by fixed point operators was research area. The classical tool to guarantee consistency of expansions by fixed points of other logics is **Knaster-Tarski fixed point theorem** for monotone operators. In his **Ph.D. dissertation**, under the supervision of Prof. Franco Montagna, L. S. proposed an original approach which allows to give a semantics also to *non-monotone* formulas. The key idea is to use the functional semantics of many-valued logic, thereby ensuring the existence of fixed points on the basis of **Brouwer fixed point theorem**. The results of this research, that stretched out after the completion of his PhD, were published in several articles [14], [12], [9], [5]. The theory that originated has connections with real closed fields, Galois theory and piecewise linear geometry.

Finally, in his [Master thesis](#), together with F. Montagna, L.S. solved the problem of the discontinuity of the connectives of the logic $\mathbb{L}\Pi$ by providing a family logical systems that approximate $\mathbb{L}\Pi$ with arbitrary precision, yet retaining the continuity of all its connectives. The results were published in [15], [18].

Publications

Papers in refereed journals

- [1] O. Caramello, V. Marra and —. General affine adjunctions, Nullstellensätze, and dualities. 31 pages. *Accepted for publication on the [Journal of Pure and Applied Algebra](#)*, arXiv:1412.8692.
- [2] J. Gil-Férez, —, C. Tsinakis, H. Zhou. Join completions for Ordered Structures. 44 pages. *Accepted for publication on the [Annals for Pure and Applied Logic](#)*, arXiv:1708.04990.
- [3] N. Bezhanishvili, N. Galatos, —. Canonical formulas for k -potent commutative, integral, residuated lattices. [Algebra Universalis](#) **77**(3), 2017. DOI 10.1007/s00012-017-0430-7.
- [4] L. M. Cabrer and —. MV-algebras, infinite dimensional polyhedra, and natural dualities. [Archive for Mathematical Logic](#). **56**(1), 21–42. 2017.
- [5] —. An expansion of Basic Logic with fixed points. [Special issue of Soft Computing in memoriam Franco Montagna](#). **21**:29–37, 2017.
- [6] V. Marra, —, Duality, projectivity, and unification in Łukasiewicz infinite-valued propositional logic. [Annals of Pure and Applied Logic](#) **164**:192–210. 2013.
- [7] V. Marra, —. The dual adjunction between MV-algebras and Tychonoff spaces, [Studia Logica](#) **100**(1-2):253–278, 2012. Special issue in memoriam Leo Esakia (L. Beklemishev, G. Bezhanishvili, D. Mundici and Y. Venema Editors) 2012.
- [8] B. Gerla, C. Russo, —, Representation of perfect and local MV-algebras. [Mathematica Slovaca](#) **61**(3):327–340, 2011. (arXiv:1002.0980v1).
- [9] E. Marchioni, —. Advances in the Theory of $\mu\mathbb{L}\Pi$ algebras, [Logic Journal of the IGPL](#), **19**(3):476–489, 2011.
- [10] A. Di Nola, G. Lenzi, —, Representation of MV-algebras by regular ultrapowers of $[0,1]$. [Archive for Mathematical Logic](#), **49**(4):491–500 2010.
- [11] A. Di Nola, R. Grigolia, —. A discrete representation of free MV-algebras, [Mathematical Logic Quarterly](#), **56**(3):279–288 2009.
- [12] —. $\mathbb{L}\Pi$ logic with fixed points, [Archive for Mathematical Logic](#), **47**(7-8):741–763 2008.
- [13] A. Di Nola, G. Georgescu, —. Forcing in Łukasiewicz predicate logic. [Studia Logica](#) **89**(1):111–145, 2008.
- [14] —. μ MV algebras: an approach to fixed points in Łukasiewicz logic. [Fuzzy Sets and Systems](#), Special Issue: Mathematical and Logical foundations of Soft Computing. **159**:1260–1267 Elsevier, Amsterdam. 2008
- [15] F. Montagna, —. Continuous approximations of product implication in MV-algebras with product, [Soft Computing](#), **9**(3):149–154, Springer-Verlag, Berlino, 2005.

Proceedings (with referee)

- [16] —, Some consequences of compactness in Łukasiewicz logic. in C. Drossos, P. Peppas and C. Tsinakis Eds. *Proceeding of the VII Panhellenic Symposium*. 2009.
- [17] —. μ MV algebras : an approach to fixed points in Łukasiewicz logic, in *Proceeding of the Intl. Conference on The Logic of Soft Computing*, Malaga, 2006.
- [18] —, Continuous approximations of MV-algebras with product and product residuation: a category-theoretic equivalence, *Collegium Logicum*, 8, Vienna, 2005.

Book chapters

- [19] A. Di Nola, —. A short introduction to formal fuzzy logic via t-norms, in D'ambra, etc. Editori, *Modelli e Tecnologie dell'informazione a Supporto delle Decisioni*, Franco Angeli Editore. 2008. ISBN 9788846483812.
- [20] V. Marra, F. Montagna, and —. Logiche Polivalenti. in H. Hosni, G. Lolli e C. Toffalori, [Le direzioni della ricerca logica in Italia](#). Edizioni della Normale. 2015. ISBN 978-88-7642-570-7.

Invited papers

- [21] —. Geometric dualities for Łukasiewicz logic. [Bollettino dell'UMI](#), **VI**(9):749-763 2013.
- [22] —. Punti fissi nelle logiche a più valori, [Bollettino dell'UMI](#): La Matematica nella Società e nella Cultura. Serie VIII, Vol. **X-A**:355–358, 2007.

Volumes (as editor)

- [23] Proceedings of Many-Valued Logic 2012. In honour of Antonio Di Nola's 65th birthday. [Mathematica Slovaca](#), Volume 65, Issue 4. Edited by A. R. Ferraioli, B. Gerla, C. Russo and L. Spada. 2015
- [24] Selected papers of the 8th International Tbilisi Symposium on Logica, Language and Computation. [Lecture Notes in Computer Science](#) 6618, Edited by N. Bezhanishvili, S. Löbner, K. Shwabe and L. Spada. 2011.
- [25] Festschrift on the occasion of Franco Montagna's 60th birthday, [Annals of Pure and Applied Logic](#) Volume 161, Issue 2. Edited by T. Flaminio, N. Preining, L. Spada. 2009.

Preprints

- [26] M. Abbadini, V. Marra and —. Stone-Gelfand duality, for groups: Topological duality and equational axiomatisation for metrically complete lattice-groups. *In preparation, 2019*.
- [27] A. Di Nola, G. Lenzi, and —, Sheaf representations and locality of Riesz spaces with order unit. *In preparation, 2019*.
- [28] A. Di Nola, G. Lenzi, V. Marra and —, The algebras of piecewise-linear maps. *In preparation, 2019*.
- [29] V. Marra and —. Two isomorphism criteria for directed colimits. 11 pages. [arXiv:1312.0432](#), 2013.

Talks at Conferences

- September 2019 [TbiLLC 2019](#) (Tbilisi Symposium on Logic, Language and Computation). Batumi, 16–20 September 2019.
Talk: An algebraic study of Łukasiewicz logic with hedges.
- June 2019 [TACL IX](#) (Topology, Algebra, and Categories in Logic). Nice, France 17–21 June 2019.
Talk: Norm complete Abelian l-groups: topological duality.
- September 2017 [XXVI Incontro AILA](#). Padova, Italy, 25-28 September 2017.
Talk: Denominator respecting maps.
- August 2017 [Logic Colloquium 2017](#). Stockholm, Sweden, 14-20 August 2017.
Talk: Łukasiewicz logic, with coefficients.
- September 2015 [XX Congress of the Italian Mathematicians](#). Siena, Italy.
Talk: The Nullstellensatz for varieties, and topological dualities.
- February 2014 [Shanks Workshop on Ordered Algebras and Logic](#), Nashville, US.
Canonical Formulas and Residuated Lattices.
- December 2013 [International Workshop on Algebraic Logic in Computer Science \(a satellite workshop of LPAR\)](#), Stellenbosch, South Africa.
Talk: An Isomorphism Criterion for Colimits of Sequences of Finitely Presented Objects
- October 2013 [Algebra|Coalgebra Seminar](#), Amsterdam, The Netherlands.

- Talk: Two isomorphism criteria for directed colimits.
- August 2013 **TACL VI** (Topology, Algebra, and Categories in Logic), Nashville, US.
A general framework for geometric dualities for varieties of algebras.
- September 2011 **XIX Congresso dell'Unione Matematica Italiana**, Bologna, Italy.
Talk: Dualità geometriche per la logica di Łukasiewicz, (selected as **featured presentation**)
- July 2011 **TACL V** (Topology, Algebra, and Categories in Logic), Marseille, France
Talk: The unification type of Łukasiewicz logic is nullary, (selected as **featured presentation**)
- May 2010 **ManyVal10**: Beyond algebraic semantics: bridging intended and formal interpretations of many-valued logics, Varese, Italy
Talk: Omitting type theorems for Łukasiewicz Logic
- November 2009 **International workshop on Probability, Uncertainty and Rationality**, Siena, Italy.
Talk: A uniform version of Di Nola Theorem.
- September 2009 **TbiLLC**: 8th International Tbilisi Symposium on Language, Logic and Computation, Tbilisi.
Talk: Advances in the theory of fixed points in many-valued logics.
- July 2009 **7th Panhellenic Logic Symposium 2009**, Patras.
Talk: Some consequences of compactness in Łukasiewicz Predicate Logic.
- July 2009 **TACL IV** (Topology, Algebra, and Categories in Logic), Amsterdam.
Talk: Small advances in the algebraic proof theory of substructural logics.
- September 2007 **XVIII Congresso dell'Unione Matematica Italiana**, Bari.
Talk: Costruzioni universali nella varietà μLI .
- August 2007 **TA(N)CL III** (Algebraic and Topological Methods for non-Classical Logics), Oxford.
Talk: Free constructions of μLI algebras.
- June 2007 **3^d MATHLOGAPS Workshop**, Assois.
Talk: Finite and Infinite Forcing in Łukasiewicz Logic.
- September 2006 **The Logic of Soft Computing V**, Malaga.
Talk: μMV algebras: an approach to fixed points in Łukasiewicz Logic
- August 2006 **2^d MATHLOGAPS Workshop**, Leeds.
Talk: Algebra and Fuzzy Logic.
- August 2005 **TA(N)CL II** Algebraic and Topological Methods for non-Classical Logics, Barcelona.
Talk: LI logic and fixed points.
- August 2003 **8th Kurt Gödel Colloquium**, Vienna.
Invited poster session: LI algebras and quasi-fields

FUNDINGS

Selected Funded Projects

- June 2019 - May 2022 **PRIN 2017:** (Progetto di Ricerca di Interesse Nazionale): *Theory and applications of resource sensitive logics*. Coordinator: prof. Francesco Paoli.
 – Total co-funding: **264.800** euros.
 – Position in the project: **Coordinator of the unit.**
- March 2016 - March 2019 **RISE (Horizon 2020):** Marie Skłodowska-Curie Research and Innovation Staff Exchange - *Syntax meet Semantics: Methods, Interactions, and Connections in Substructural logics*. The project involves 25 Universities in Argentina, Australia, Austria, Brazil, Czech Republic, Italy, Japan, Singapore, Spain, Slovakia, South Africa, the Netherlands, and United States. Please visit <http://logica.dipmat.unisa.it/sysmics/> for more information.
 – Total co-funding: **500.000** euros.
 – Position in the project: **Coordinator of the project.**
- March 2011 - March 2015 **IRSES (FP7):** Marie Curie International Research Staff Exchange Scheme - *Mathematical Tools for the Management of Uncertain and Vague Information*. The project involves 13 Universities in Argentina, Brazil, Czech Republic, Italy and Spain. Please visit <http://logica.dipmat.unisa.it/matomuvi/> for more information.
 – Total fundings: **174.600** euros.
 – Position in the project: **Coordinator of the project.**
- January 2012 - January 2015 **PRIN 2010-11** (Progetto di Ricerca di Interesse Nazionale): *Logical tools for the management of Information*. Coordinator: prof. Antonio Di Nola.
 – Total co-funding: **550.000** euros.
 – Position in the project: **Researcher (member of the leading unit).**
- March 2010 - January 2012 **PRIN 2008** (Progetto di Ricerca di Interesse Nazionale): *Algebraic semantics for the uncertainty*. Coordinator: prof. Antonio Di Nola.
 – Total co-funding: **45.000** euros.
 – Position in the project: **Researcher (member of the leading unit).**
- March 2019 - March 2022 **FARB 2018** (Fondo di Ateneo per la Ricerca di Base): *Approcci algebrici e geometrici alle logiche a più valori*.
 – Total fundings: 9.000 euros.
 – Position in the project: **Coordinator of the project.**
- November 2017 - November 2020 **FARB 2017** (Fondo di Ateneo per la Ricerca di Base): *Approcci algebrici e geometrici alle logiche a più valori*.
 – Total fundings: 8.700 euros.
 – Position in the project: **Coordinator of the project.**

Scholarships

- August 2013 - July 2015 **Marie Curie (FP7)** scholarship awarded by UE for the individual project ADAMS (A Dual Approach to Many-valued Semantics).
 – Total fundings: **183.000** euros.
 – Position in the project: **Principal investigator.**
- October 2003 - October 2006 **Ph.D.** scholarship (3 years) awarded by the University of Siena.
- September 2005 - January 2006 **Marie Curie** scholarship (5 months) awarded by the University of Lyon “Claude Bernard” on behalf of the E.U.
- October 2002 - October 2003 **Ph.D.** scholarship (1 years) awarded by A.R.D.S.U. of Siena on behalf of Regione Toscana.
- September 2000- August 2001 **ERASMUS** scholarship (1 year) awarded by the University of Siena on behalf of the E.U.
- September 2000- August 2001 **International Mobility** scholarship (1 year) awarded by A.R.D.S.U. of Siena on behalf of Regione Toscana.
- September 1998 - September 2002 **Merit** scholarship (4 years) awarded by A.R.D.S.U. of Siena on behalf of Regione Toscana.

ACADEMIC RECOGNITIONS

Editorial boards

- January 2014 - Present **Associate Editor** of Soft Computing.
- January 2012 - January 2014 **Managing Editor** of Soft Computing.
- November 2013 Guest editor of *Mathematica Slovaca*. Special issue for the 65th birthday of prof. Antonio Di Nola.
- November 2009 Guest editor for the series **Lectures Notes in Computer Science**. Special issue containing selected works presented at the 8th International Tbilisi Symposium on Language, Logic and Computation.
- September 2008 Guest editor for **Annals of Pure and Applied Logic**. Special issue dedicated to prof. Franco Montagna's 60th birthday

Conference committees

- April 2020 Member of the Scientific Committee of the conference **LATD 2020**.
- September 2019 Member of the Scientific Committee of the conference **TbiLLC** Tbilisi, Georgia.
- December 2018 Member of the Scientific Committee of the conference **Syntax meets Semantics 2019**, Amsterdam, the Netherlands.
- September 2018 Member of the Scientific Committee of the Second **SYMICS school**, Les Diablerets, Switzerland.
- September 2018 **Chair** of the Organising Committee of the conference **Geometry and non classical logic** (dedicated to the 70th birthday of Antonio Di Nola), Salerno, Italy.
- April 2017 Member of the Scientific Committee of the conference **TbiLLC** Tbilisi, Georgia.
- September 2016 **Chair** of the Scientific Committee of the conference **Syntax meets Semantics 2016**, Barcellona, Spain.
- September 2015 **co-Chair** of the Scientific Committee of the conference **TbiLLC** Tbilisi, Georgia.
- July 2015 **Chair** of the Organising Committee of the conference **TACL** (Topology, Algebra, and Categories in Logic) Ischia, Italy.
- June 2013 Member of the Organising Committee of the conference **Model Theory** Ravello, Italy.
- April 2013 **Co-organiser** of the workshop "Many valued logics" at the 3^d International Conference on Universal Logic, Rio de Janeiro, Brazil.
- September 2013 Member of the Scientific Committee of the conference **TbiLLC** (Tenth International Tbilisi Symposium on Language, Logic and Computation), Georgia.
- August 2012 Member of the Scientific Committee of the conference **PMUV** (Philosophy and Mathematics of Uncertainty and Vagueness), Campinas, Brazil.
- July 2012 Member of the Programme Committee of **ManyVal12**, celebrating Antonio Di Nola's 65th birthday, Salerno, Italy.
- September 2011 **Co-Chair** of the Scientific Committee for the conference **TbiLLC**: Tbilisi Symposium Series on Language, Logic and Computation, a series organised by the ILLC of the University of Amsterdam. Tbilisi
- May 2011 Member of the organising committee of the international conference **Algebraic Semantics for Uncertainty and Vagueness**, Salerno, Italy.
- November 2010 Member of the organising committee of the conference **Logica, linguaggio e didattica della matematica**, Salerno, Italy.
- September 2008 Member of the organising committee of the international conference **Logic, Algebra and Truth Degrees**, Siena.
- June 2007 Member of the organising committee of the international conference **CIE07 (Computability in Europe)**, Siena.

Conference invited talks

- June 2017 Geometric aspects of MV-algebras. **TACL**: Topology, Algebra and Categories in Logic (TACL). Prague, Czech Republic.
- December 2015 An extension of Basic Logic with fixed points, **Coherence and Truth**. *In memoriam Franco Montagna*. Certosa di Pontignano (Siena), Italia.

- July 2014 *Dualities*, invited tutorial at [The Latin American Symposium on Mathematical Logic](#). Buenos Aires, Argentina.
- September 2012 The multifarious representations of MV-algebras, [LATD: Logic, Algebra, and Truth Degrees](#). Kanazawa, Japan.

Workshop invited talks

- September 2018 *Kakutani duality, for groups*. Duality in Algebra and Logic. Chapman University, Orange, CA, USA.
- July 2018 *Denominator preserving maps*. Topological Methods in Logic ([ToLo](#)) VI. Tbilisi, Georgia.
- November 2016 *A categorical duality for residuated lattices*. [Soft Computing Days](#). Beijing, China.
- June 2016 *A duality for lattices with residuated operations*. Topological Methods in Logic ([ToLo](#)) V. Tbilisi, Georgia.
- May 2015 *A duality for the whole variety of MV-algebras via Ind- and Pro-completions*. [ALCOP](#) 2014. University of Delft, The Netherlands.
- December 2014 *A(nother) duality for the whole variety of MV-algebras*. [BEYOND](#) 2014. University of Florence, Italy.
- December 2014 *A general framework for dualities*. Workshop on dualities and Markov processes. [McGill University](#) Bellairs Research Institute, Barbados.
- September 2011 *Dualities for MV-algebras, "Ordered groups and lattices in algebraic logic"*. [Tbilisi, Georgia](#). Conference of the series *Studia Logica* in memoriam Leo Esakia.
- October 2010 *Unification for Abelian l-groups* Lattice-Ordered Groups and MV-Algebras: Interaction and Impact on Algebras of Logic. [Academy of Sciences, Buenos Aires](#), Argentina
- August 2010 *Projectivity and unification in many valued logic*, Workshop at [CSL: Computer Science in Logic](#) 2010. Brno, Repubblica Ceca.
- June 2010 *The prime spectrum of MV-algebras*, Topological methods in Logic ([ToLo](#)). Tbilisi, Georgia.

Invited Seminars

- April 2018 *An overview of MV-algebras*. [Melbourne University](#), Australia.
- March 2018 *General affine adjunctions, Nullstellensätze, and dualities..* [Latrobe University](#) (Melbourne), Australia.
- February 2018 *Canonical formulas for k-potent commutative, integral, residuated lattices..* [Latrobe University](#) (Melbourne), Australia.
- November 2014 *A general framework for dualities*. Mathematical Institute. [Oxford University](#), UK.
- May 2014 *General affine adjunctions, Nullstellensätze, and dualities*. Applied Logic Seminars. [Delft University of Technology](#), The Netherlands.
- March 2014 *Axiomatisations for all varieties of n-potent residuated lattices*. Prague seminar on substructural logics Prague, Czech Republic.
- October 2013 *General affine adjunctions, Nullstellensätze, and dualities*, Colloquium on Mathematical Logic. [ILLC](#), Amsterdam, The Netherlands.
- May 2010 *Rappresentazioni di MV-algebre per fasci: una road map*, Dipartimento di Informatica e Comunicazione, [Università di Milano](#), Italy.
- May 2010 *Unification and projective algebras in Łukasiewicz Logic*, Dipartimento di Scienze dell'Informazione, [University of Milano](#), Italy.
- February 2010 *A discrete representation of free MV-algebras*, Dipartimento di Matematica, [University of Genova](#), Italy.
- December 2008 *Forcing in many-valued logic*, [Czech Academy of Sciences](#). Prague, Czech Republic.
- October 2008 *The geometry of MV^n -algebras*, Dipartimento di Scienze dell'Informazione, [University of Milano](#), Italy.
- September 2008 *Free MV algebras as direct limit*, Mathematical Institute, [Slovak Academy of Sciences](#). Bratislava, Slovakia.
- June 2008 *Fixed points in computer science: a many-valued perspective*, [Tbilisi State University](#). Tbilisi, Georgia.

- May 2008 *Fixed points in many-valued logic*, Institute of Mathematics “Simion Stoilow” **Accademia delle Scienze Rumena**. Bucarest, Romania.
- November 2006 *Fixed points in fuzzy logics*, Dipartimento di Matematica ed Informatica. **University of Salerno**. Italy.
- September 2005 *T-normes comme fondement de la logique floue*, Institut Camille Jordan. **Université Claude Bernard Lyon 1**. France.

Positions in academic associations

- September 2017 - Present **Secretary** of the Italian Association for Logic and its Applications (AILA).
- September 2017 - Present **Treasurer** of the Italian Association for Logic and its Applications (AILA).

TEACHING ACTIVITIES

Invited and international courses

- September 2017 **Logica algebrica**, invited course (12 hours) at the AILA Summer School of Logic. Gargnano, Italy.
- September 2014 **Lecturer** for the course *Many Valued Logics* (6 CFU) for the M.Sc. in Logic. ILLC, University of Amsterdam, The Netherlands.
- February 2014 **Lecturer** for the project *Duality Theory* (6 CFU) for the M.Sc. in Logic. ILLC, University of Amsterdam, The Netherlands.
- October 2013 **co-Lecturer** for the course *Capita Selecta in Modal Logic* (6 CFU) for the M.Sc. in Logic. ILLC, University of Amsterdam, The Netherlands.
- August 2012 **Łukasiewicz logic and MV-algebras**, invited course at the summer school PMUV. Campinas (SP), Brazil.
- August 2012 **Some fundamental results in many-valued logic**, invited course at Izmir Winter School in Non-Classical Logic and its Applications. Izmir, Turkey.
- September 2009 **Introduction to fuzzy sets and fuzzy logic**, invited course at the summer school REASON PARK (REASONing under PARTial Knowledge). Foligno, Italy.
- September 2009 **An introduction to many-valued logic and its algebraic semantics** invited course at the Tbilisi Summer School in Logic. Tbilisi, Georgia.

PhD courses

- May 2019 - June 2019 **Lecturer** for the course *Topos Theory* for the Ph.D. in Mathematics and Physics. University of Salerno.
- May 2018 - June 2018 **Lecturer** for course *Category Theory* for the Ph.D. in Mathematics and Physics. University of Salerno.
- January 2017 - February 2017 **Lecturer** for the course *Category Theory* for the Ph.D. in Mathematics and Physics. University of Salerno.

Tutoring

- August 2016 - July 2019 **Supervisor** of the **PostDoc** research of Dr. Serafina Lapenta.
- May 2018 - September 2018 Supervisor for a MSc thesis in Logic (Federica Di Stefano, University of Salerno, *110 cum laudæ*).
- January 2018 - June 2018 Supervisor for a BSc thesis in Logic (Elvira Plenzich, University of Salerno, *107*).
- January - March 2017 Supervisor for a BSc thesis in Logic (Alice Ciliberti, University of Salerno, *110 cum laudæ*).
- September 2012 Supervisor for a MSc thesis in Logic (Anna Carla Russo, University of Salerno, *110 cum laudæ*).
- January 2010 - September 2010 Supervisor for a MSc thesis in Logic (Caterina Limoli, University of Salerno, *110 cum laudæ*).

University courses

- September 2018 Lecturer for the course **Mathematical Logic** (7 CFU) for the B.Sc. in Mathematics, University of Salerno.
- September 2018 Lecturer for the course **Calculus I** (9 CFU) for the B.Sc. in Mechanical Engineering, University of Salerno.
- September 2017 Lecturer for the course **Calculus I** (9 CFU) for the B.Sc. in Mechanical Engineering, University of Salerno.
- September 2017 Lecturer for the course **Mathematical Logic** (7 CFU) for the B.Sc. in Mathematics, University of Salerno.
- September 2017 Lecturer for the course **Calculus I** (5 CFU) for the B.Sc. in Environmental Science, University of Salerno.
- September 2016 Lecturer for the course **Calculus I** (9 CFU) for the B.Sc. in Mechanical Engineering, University of Salerno.
- September 2016 Lecturer for the course **Calculus I** (5 CFU) for the B.Sc. in Environmental Science, University of Salerno.
- September 2015 Lecturer for the course **Mathematics for Economy** (10 CFU) for the B.Sc. in Economy and Management, University of Salerno.

- September 2012 Lecturer of the course **Computability Theory I** (6 CFU) for the M.Sc. in Mathematics. University of Salerno.
- September 2012 Teaching assistant (MAT/01, 1 CFU) for the course **Mathematical Logic I** for the B.Sc. in Mathematics. University of Salerno.
- September 2012 Lecturer for the Logic part of the course (MAT/02, 3 CFU) **Discrete Mathematics and Mathematical Logic** for the B.Sc. in Computer Science. University of Salerno.
- March 2012 Lecturer for the course **Mathematical Logic II** (MAT/01, 6 CFU) for the M.Sc. in Computer Science. University of Salerno.
- October 2010 Adjunct Professor for the course **Logic** (MAT/01, 6 CFU) for the M.Sc. in Cognitive Psychology at Seconda University of Napoli, Italy.
- October 2009 Adjunct Professor for the course **Logic** (MAT/01, 4 CFU) Master Degree in Cognitive Psychology at Second University of Napoli.

Math education activities

- June 2019 - October 2019 **Lecturer** for the course *Numeracy* within Progetto Alphas: potenziamento delle competenze di base nel biennio della scuola secondaria superiore. University of Salerno.
- March 2019 - April 2019 **co-Lecturer** for the course *Laboratorio di Matematica* within Progetto Lauree Scientifiche, University of Salerno, Liceo Geonino and Liceo La Mura.
- January 2017 - March 2017 **co-Lecturer** for the course *Laboratorio di Matematica* within Progetto Lauree Scientifiche, University of Salerno and Liceo Alfano I.
- January 2012 - April 2013 **Lecturer** for the course *Laboratorio di Matematica* within Progetto Lauree Scientifiche, University of Salerno and Liceo Alfano I.
- March 2012 **External Teacher** as expert in Logic for the national project P.O.N. F.S.E. 2012 at the istituto Magistrale Galizia. Nocera Inf. (SA)
- April 2009 - June 2009 **External Professor** as expert in Logic for the national project P.O.N. F.S.E. 2008 at the istituto Magistrale Galizia. Nocera Inf. (SA)
- Title of the project:** Il giardino di Archimede: fantasia e logica nella matematica
- April 2008 - June 2008 **External Professor** as expert in Logic for the national project P.O.N. F.S.E. 2008 at the istituto Magistrale Galizia. Nocera Inf. (SA)
- Title of the project:** Alice allo specchio: le meraviglie della matematica
- January 2008 - September 2008 **Adjunct Professor** for the course *Logica* for the school S.I.C.S.I. (Scuola Interuniversitaria Campana di Specializzazione all'Insegnamento) of University of Salerno.

OTHER SERVICES

Selection committees

- June 2019 Member of the selection committee for a PostDoc position in Algebra at the University of Salerno.
- February 2018 Member of the selection committee for a PostDoc position Logic at the University of Salerno.
- February 2018 Member of the committee for the renewal of a RTD-A position in Mathematics Education at the University of Salerno.
- February 2017 Member of the selection committee for a RTD-A position in Logic at the University of Padova.

Department committees

- September 2019 - September 2022 Member of the PhD academic board, Department of Mathematics and Department of Physics.
- May 2018 - Present Member of the committee for the Web of the Department of Mathematics.
- May 2018 - Present Member of the committee for Quality Assurance of Research of the Department of Mathematics.

Referee activities

Referee for numerous mathematical journals such as: Journal of London Mathematical Society, Revista Matemática Iberoamericana, Houston Journal of Mathematics, Annals of Pure and Applied Logic, Journal of Symbolic Logic, Journal of Pure and Applied Algebra, Archives for Mathematical logic, Algebra Universalis, Order, Studia Logica, Mathematical Logic Quarterly, Fuzzy sets and Systems, etc.

Referee for numerous research projects at Italian universities.

Referee for a PhD thesis at Univeristà dell'Insubria.

Reviewer for MathSciNet and Zentralblatt.

- June 2018 Referee for the [Czeck Research and Development Agency](#).
- November 2017 Referee for the [MIUR](#) (Italian Ministry of Research and Education).
- August 2016 Referee for the [ANVUR](#) (Italian Agency for Research Evaluation).
- November 2011 Referee for the [INDAM](#) (Italian Institute for High Mathematics).
- October 2007 Referee for the [Slovak Research and Development Agency](#).

Academic associations

- January 2019 - Present Member of the American Mathematical Society [AMS](#).
- January 2018 - Present Member of the Italian Mathematical Society [UMI](#).
- September 2007 - Present Member of the Italian Association for Logic and its applications ([AILA](#)).
- September 2007 - Present Member of Research group GNSAGA of the Italian Institute for Higher Mathematics.
- September 2008 - Present Member of the international research group [Computability in Europe](#).
- September 2007 - Present Member of the EUSFLAT research working group [MathFuzzLog](#).