PERSONAL INFORMATION

Family name, First name: MARZUOLI ANNALISA

March 24, 1955, Milano, Italy

EMPLOYMENT

Dec. 2013: National Scientific Qualification (ASN 2012), Full Professorship in Mathematical Physics;

2000-present: Associate Professor of Mathematical Physics (Dept. of Nuclear and Theoretical Physics, since 2011 Dept. of Mathematics 'F Casorati'), University of Pavia;

1984-2000: Researcher of Theoretical Physics (Inst. of Theoretical Physics and then Dept. of Nuclear and Theoretical Physics), University of Pavia.

FELLOWSHIPS AND VISITING POSITIONS

1979-1982: Research Fellowship of the National Research Council in Mathematical Physics;

March-May 1993: Santa Barbara, CA: Semester *Small Scale Structure of Spacetime*;

July-August 1997: Santa Fe, New Mexico: *New Directions in Simplicial Quantum Gravity*;

May 2014: Visiting Professor, Charles University in Prague, Faculty of Mathematics and Physics (LLP Erasmus Mobility Programme), lectures at the graduate level.

MEMBERSHIPS & SCIENTIFIC COORDINATIONS

1980-present: research associate, National Group of Mathematical Physics (GNFM) of the National Institute of Advanced Mathematics (INdAM);

1987-present: research associate, National Institute of Nuclear Physics (INFN);

2000/01-2010/11: participant to several PRIN (National Research Projects) in Mathematics;

2004: Coordinator of the interdisciplinary Project *Geometric Partition Functions* (INdAM)

2006-2012: research associate, Institute for the Scientific Interchange, Torino, Italy;

2009-10: Scientific Coordinator of the Italian team of the bilateral Project (Consortium E.I.N. S.T.E.I.N-Russian Foundation for Basic Research) *Semiclassical Analysis of Quantum Integrable Systems modeled on Racah-Wigner algebra;*

2015: Scientific Coordinator of the INdAM Meeting *Chromatic and Colored Structures in Geometry and Statistical Physics*;

2015: co-organizer of the series of public lectures *Einstein 2015, 100 anni di Relatività Generale*, University of Pavia;

2014-present: elected member, Board of the Italian Society of General Relativity and Gravitational Physics;

2014-present: scientific coordinator of the Pavia Unit of the Project *Geometry and Symmetry in Quantum Field Theory* (INFN, National Commission IV).

INSTITUTIONAL SERVICES

1991-1996 and 1998-2000: elected member, Academic Committee (Senato Accademico) of Pavia University;

Nov 2009 - Jan 2013: elected member, Management Board (Consiglio di Amministrazione) of Pavia University;

Member of hiring and reviewing committees, PhD and post-doc selection committees in Italian Universities and for INFN;

Since 2016: member of the Board of the Doctorate Course in Mathematics Pavia-Milano Bicocca-INdAM.

PUBLICATIONS

Coauthor of 80+ publications & three research monographs

https://scholar.google.it/citations?user=DhCY9AUAAAAJ&hl=it

RECENT RESEARCH TOPICS AND SELECTED PUBLICATIONS

1. **Quantum algorithms for topological invariants**

1a. S Garnerone, A Marzuoli, M Rasetti, *Efficient quantum processing of 3-manifold topological invariants*, Adv. Theoretical and Mathematical Physics **13**, 1601-1652 (2009)

2. **Topological quantum computation**

2a. Z Kádár, A Marzuoli, M Rasetti, *Microscopic description of 2d topological phases, duality and 3d state sums*, Adv. Mathematical Physics **2010**, 671039 (18 pp) (2010)

2b. A Marzuoli, G Palumbo, *BF-Theory in graphene: a route toward topological quantum computing?*, Europhys. Lett. **99**, 10002 (5 pp) (2012)

2c. A Marzuoli, M Rasetti, *Spin network quantum circuits*, Int. J. Circuit Theory and Applications **45**, 951-969 (2017)

3. **Spin networks and applications**

3a. R W Anderson, V Aquilanti, A Marzuoli, *3nj morphogenesis and asymptotic disentangling*, J. Phys. Chem. A **113**, 15106-15117 (2009)

3b. V Aquilanti, D Marinelli, A Marzuoli, *Hamiltonian dynamics of a quantum of space: hidden symmetries and spectrum of the volume operator, and discrete orthogonal polynomials*, J. Phys. A: Mathematical and Theoretical **43**, 175303 (9 pp) (2013)

3c. V Aquilanti, D Marinelli, A Marzuoli, *Symmetric coupling of angular momenta, quadratic algebras and discrete polynomials*, J. Phys. Conference Series **482**, 012001 (13 pp) (2014)

4. **Algebraic and geometric methods in Quantum Field Theory**

4a. M Carfora, A Marzuoli, M Rasetti, *Quantum tetrahedra*, J. Phys. Chem. A **113**, 15376-15383 (2009)

4b. M Carfora, A Marzuoli, *Quantum Triangulations: Moduli spaces, Strings, and Quantum Computing*, Lecture Notes in Physics **845** (295 pp.), Springer--Verlag Berlin--Heidelberg (2012) ISBN 9783642244391

4c. A Marzuoli, F A Raffa, M Rasetti, *Where do bosons actually belong?*, J. Phys. A: Mathematical and Theoretical **47**, 275292 (9 pp) (2014)

RECENT INVITED PRESENTATIONS

-ESF Exploratory Workshop 'Gravity as Termodynamics' (SISSA Trieste, 4-9 September, 2011) (*Spin networks: from quantum topology to quantum computing and back*)

-CECAM Workshop 'Spin Networks in Atomic and Molecular Physics, Quantum Chemistry and Quantum Computing' (ETH Zurich, June 27-29, 2011) (*Spin networks, quantum computing and automata*)

-27th Indian-Summer School of Physics on 'Graphene - the bridge between low- and high-energy physics', Prague, 14-18 September 2015 (*BF theory and graphene -1 lecture- & Colored discretizations of Topological Quantum Field Theories -3 lectures-*)

-INdAM Meeting 'Chromatic and Colored Structures in Geometry and Statistical Physics', Cortona, Italy, May 24-30, 2015 (*Quadratic algebras, Regge symmetry and quantum grammars*)

-Inaugural Conference of the 'Arnold-Regge Center for Algebra, Geometry and Theoretical Physics', Torino, Italy, February 27-March 2, 2017 (*Desargues-Regge spin networks*)