Curriculum Vitae

Roberto Longo

Particulars
Name: Roberto Longo
Birth:
Nationality:
Office address: Dipartimento di Matematica, Università di Roma Tor Vergata,
                Via della Ricerca Scientifica, 1 - I-00133 Roma, Italy
Web page: http://www.mat.uniroma2.it/longo

Current position:
Full Professor of Functional Analysis, University of Rome Tor Vergata
Director of the Center for Mathematics and Theoretical Physics, Rome

Language skill:
Italian (mother tongue), English (fluent), French (basic).

Academic Education and Scholarships
1974 – 1975   C.N.R. (National Research Council) predoc – Rome – Italy
23. 06.1975   Laurea in Matematica, University of Rome Sapienza (maximum grade with honors in each individual exam)
1975 – 1977   C.N.R. (National Research Council) postdoc – Rome – Italy
1978 – 1979   Sabbatical year, C.N.R. scholarship. Visiting scholar at the University of Pennsylvania. Research Associate at the University of California at Berkeley (4 months)

Professional Appointments
10.77 – 09.78   Assistant Professor (non-tenure) - University of Rome Sapienza
10.78 – 10.80   Assistant Professor (tenure) - University of Rome Sapienza
10.79 – 10.80   Associate Professor (non-tenure) - University of Rome Sapienza – Rome
11.80 – 04.86   Associate Professor (tenure) - University of Rome Sapienza
11.93 – 10.96   "Professore distaccato" – Centro Linceo Interdisciplinare "B. Segre", Accademia Nazionale dei Lincei (National Academy of Sciences) – Rome
05.86 –   Full Professor (tenure) - University of Rome Tor Vergata
11.09 –   Director of the Center for Mathematics and Theoretical Physics – Rome

Awards and honors
2013 –   Fellow of the American Mathematical Society, USA
07.2013   Conference on the occasion of my 60th birthday: "Mathematics and Quantum Physics", Accademia Nazionale dei Lincei, Rome, July 2013
2014 –   Humboldt Research Award, Germany.
2016 –2018   Member of the "Mathematical Physics" panel for the International Congress of Mathematicians, Rio de Janeiro 2018

Invited Speaker at Congresses (sample)
International Congress of Mathematicians, Zürich 1994.
International Congress of Mathematical Physics, Berlin 1981, Swansea 1988, Paris 1994, Lisbon 2003.
International Congress of Mathematical Physics, Prague 2010, Plenary speaker.
Strings 2018, Okinawa, Plenary speaker.

Funding ID
PI of the Advanced Grant QUEST "Quantum Algebraic Structures and Models" by the European Research Council, 1.12.2015 – 30.11.2020
PI of the Advanced Grant OACFT "Operator Algebra and Conformal Field Theory" by the European Research Council, 1.12.2008 – 30.11.2013
National Coordinator of the Italian MIUR PRIN (Programma di Ricerca di Rilevante Interesse Nazionale) "Operator Algebras, Noncommutative Geometry and Applications", 1.02.2013 – 31.1.2016 and several previous PRIN Grants.

PI of the MIUR - FARE grant QUEST-NET "Operator Algebras and (non)-equilibrium Thermodynamics in Quantum Field Theory", 2017 - 2020

Publications breakdown

PhD students

Supervisor of several PhD students (both in Mathematics and in Physics), most of them came as PhD students to my department from other universities in Italy or abroad in order to study under my direction. Among my previous PhD students I mention Tommaso Isola and Francesco Fidaleo (PhD in Mathematics at Rome Sapienza, now full professors in my departments), Romeo Brunetti (PhD in Physics at Naples, now associate professor in Trento), Annalisa Degan, Paolo Bertozzini (PhD in Mathematics in Milan, now professor in Thailand), Roberto Conti (PhD in Mathematics, now associate professor at Rome Sapienza), Among my recent PhD students, I mention: Yan Wang (from China, now in the US), Mihaly Weiner (from Hungary, now professor at Budapest), Yoh Tanimoto (from Japan, tenure track- RTDb associate professor in my Department), Robin Hillier (from Germany, now Lecturer at Lancaster), Marcel Bischoff (from Germany, now associate professor in Ohio), Vincenzo Morinelli (postdoc at Rome Tor Vergata), Simone Del Vecchio (postdoc at Tor Vergata), Stefano Iovieno, Benedikt Wegener (ongoing), Alessio Ranallo (ongoing), Lorenzo Panebianco (ongoing)

PostDocs

I have been the supervisor of several PostDocs. I mention Mihaly Weiner, Kenny De Commer, Roberto Conti, Nicola Pinamonti, Robin Hillier, Makoto Yamashita, Paolo Camassa, Pierre Martinetti, Marting Grensing, Yoh Tanimoto, Marcel Bischoff, Katarzyna Rejzner, Luca Tomassini, Wei Yuan, Igor Khavkine, Arnaud Brothier, Alexander Stottmeister, Luca Giorgetti (ongoing), Vincenzo Morinelli (ongoing), Fabio Ciolli (ongoing), Stefano Rossi, Simone Del Vecchio, Jacopo Bassi, Maria Stella Adamo

The Center for Mathematics and Theoretical Physics in Rome

The CMTP - Center for Mathematics and Theoretical Physics was founded in 2010 by a board of renowned Mathematicians and Physicists in Rome. I am presently the director of the Center. The CMTP has already organized several important scientific events: conferences, public lectures, colloquia, etc. and hosts PostDocs and young researchers (see http://cmtp.uniroma2.it).

Main scientific contributions

Solution of the Stone-Weierstrass conjecture for factor states. Hahn-Banach theorem for factor states. Standard and split inclusions of von Neumann algebras and quantum Noether theorem in the algebraic setting (with Buchholz, Doplicher). Construction of simple injective subfactors. Sectors of factors; connection of Jones index and DHR statistics of Quantum Field Theory, classification of statistics for small index by knot invariants. Duality for finite-dimensional Hopf algebras. Modular structure in CFT (with Brunetti, Guido). Conformal PCT and spin-statistics theorem (with Guido). Analog of the Kac-Wakimoto formula with quantization of black hole entropy. A QFT index theorem for sectors. Complete rationality and modularity of representations (with Kawahigashi, Müger). Classification of local conformal net with $c<1$ (with Kawahigashi). Topological sectors, an index formula (with Xu). Sectors for cyclic orbifold models (with Kac and Xu). Noncommutative spectral invariants associated with a local conformal nets (with Kawahigashi). Algebraic formulation of Boundary Conformal Field Theory (with K.-H. Rehren). Nuclearity in CFT (with Buchholz, D'Antoni). Spectral triples associated with the super-Virasoro algebra (with Carpi, Kawahigashi, Hillier). New boundary QFT nets of von Neumann algebras (with E. Witten). Infinite spin particle are not compactly localizable (with V. Morinelli and K.H. Rehren. Non-equilibrium thermodynamics and CFT (with S. Hollands). Entropy distribution of localised states. Quantum entropy inequalities for infinite systems.

Invitations at foreign institutions (sample)

MSRI, Berkeley, USA; Fields Institute, Canada; Harvard University, Cambridge, USA; University of Warwick, UK; IHES, Bures-sur-Yvette; Institut Mittag-Leffler, Stockholm, Sweden; Institut Henri Poincaré, Paris; University of Tokyo, Japan; Hamburg University, Germany; Schrödinger Institute, Vienna; University of California, Los Angeles; Göttingen University, Germany; MIT, Cambridge, USA; RIMS, Kyoto, Japan; Simons Center, Stony Brook; Hausdorff Center, Bonn, Germany; Leipzig University, Germany; Newton

Institute, Cambridge, UK; IPAM, Los Angeles, USA; UNSW, Sydney.

Longer invitations at foreign institutions (sample)
CNRS Marseille, April-July 1981
Mathematical Science Research Institute, Berkeley, 1984-85
Hamburg University, March 1988
Fields Institute, Toronto, September 2004
University of Tokyo, December 2005
Coordinator of a research program at the Schrödinger Institute, Vienna August-December 2008
Institut Henri Poincaré, Paris, May and June 2011
Harvard University, Cambridge, February-March 2011
MIT, Cambridge, April 2011
University of Göttingen, June 2014, April and June 2015
Haudorff Institute, Bonn, May and July 2016
Newton Institute, Cambridge, January-February and May-June 2017

Invited plenary presentations at conferences (selection from 2005)
"Noncommutative Geometry and Operator Algebras", 3rd Annual Spring Inst., Nashville, USA, May 2005
"Opening Colloquium for the Center of Mathematical Physics", Hamburg, October 2005
"Noncommutative Geometry and Quantum Field Theory", Oberwolfach, October 2005
"Infinite Dimensional Lie Algebras and Local von Neumann Algebras in CFT", BIRS, Banff, May 2006
"Topics in von Neumann Algebras", BIRS, Banff, September 2006
"Micro-Macro Duality in Quantum Physics", RIMS, Kyoto, December 2006
"Free Probability, Operator Spaces and von Neumann Algebras", Sibiu, Romania, June 2007
"Noncommutative Dynamics and Applications", Fields Institute, Toronto, Canada, July 2007
"Geometry and Operator Theory", Ancona, September 2007
"1st French-Italian Meeting on Noncommutative Geometry", Opening of GREFI-GENCO, Rome, Nov 2007
"Incontro INDAM-CNRS", Rome, INDAM, May 2008
"Matematica e Teoria dei Campi", Giornata interdisciplinare, Rome, Tor Vergata, May 2008
"First Annual Meeting of the EU Network in Noncommutative Geometry", Dublin, DIAS, June 2008
"Symmetries in Mathematics and Physics", Cortona, June 2008
"Workshop on Noncommutative Geometry", Münster, September 2008
"50 Years in Algebraic Quantum Field Theory", Göttingen, July 2009
"International Congress of Mathematical Physics", Prague, August 2009
"Noncommutative Geometry and Quantum Physics", Vietri sul Mare, September 2009
"C*-Algebras", Oberwolfach, March 2010
"Quantum field theory on curved spacetimes and curved target spaces", Vienna, March 2010
"Operator algebra and Applications", Beijing, July 2010
"II_1-factors: rigidity, symmetries and classification", Paris, Institut Henri Poincaré, May 2011
"Quantum Theory and Gravitation", ETH Zurich, June 2011
"Rigorous Quantum Field Theory in the LHC Era", Vienna, ESI, September 2011
"Winter School on Operator Algebras", RIMS Kyoto, December 2011
"Noncommutative Geometry", Cardiff, April 2012
"Noncommutative Geometry, Index Theory and Applications", INDAM Cortona, June 2012
"Noncommutative Geometry and Conformal Field Theory", Oporto, July 2012
"Algebraic Quantum Field Theory", Hausdorff Institute, Bonn, September 2012
"Symmetries II", IMPA, Rio de Janeiro, June 2013
"Algebraic quantum field theory: Its status and its future", ESI, Vienna, May 2014
"Subfactors and Conformal Field Theory", Oberwolfach, March 2015
"Subfactor Theory in Mathematics and Physics", Qinhuangdao, July 2015
"Von Neumann Algebras", Hausdorff Institute, Bonn, July 2016
"Local Quantum Physics and beyond - in memoriam Rudolf Haag", DESY, Hamburg, September 2016
"Subfactor Theory, Quantum Field Theory, and Quantum Information", Harvard, Cambridge, October 2016
"Arnold-Regge Center, Inaugural Conference", Turin, March 2017
 "Conference on Noncommutative Geometry: State of the Art and Future Prospects - A celebration of Alain Connes' 70th Birthday", Fudan Univ., Shanghai, April 2017
"Subfactors, K-theory and conformal field theory", Cambridge, Newton Institute, June 2017
"Integrable Models in Statistical Mechanics, Limit Shapes and Combinatorics", Saint Petersburg, August

2017

"Reflection Positivity", Oberwolfach, November-December 2017

"Algebraic Quantum Field Theory: Where Operator Algebra meets Microlocal Analysis", Cortona, INdAM, June 2018

"Strings 2018", Okinawa, June 2018

"Subfactors in Sydney", Sydney, February 2019

"Noncommutative manifolds and their symmetries", Scalea, September 2019

"Operator Algebras in QFT and QP", Roma, December 2019

Some special talks

- Invited speaker at the "International Congress of Mathematicians", Zurich, August 1994

- Invited speaker at the "International Congress of Mathematical Physics" (4 times)

- Invited speaker, conference "Theoretical and Mathematical Physics" of the German Physical Society, Hamburg, March 1994

- Distinguished Visitor's Lecture Series "Introduction to Conformal Field Theory", Iowa University 1999 (four lectures)

- Colloquium talk, University of California, Riverside 2003

- Laudatio on the occasion of the Poincaré prize to Huzihiro Araki, Lisbon 2003

- Andrejewski Lectures "Operator algebras and quantum index theorems in Quantum Field Theory", Göttingen 2004 (series of three general talks)

- Mini-course on "von Neumann Algebras and Conformal Field Theory", Summer school on "Vertex algebras and Related Topics", Erwin-Schrödinger-Institute, Vienna, June-July 2005

- Plenary speaker at the "International Congress of Mathematical Physics", Prague, August 2009

- Laudatio on the occasion of the Laurea Honoris Causa to Isadore Singer, Rome 2010

- "Operator Algebras and Boundary Quantum Field Theory" (colloquium talk), Hamburg, November 2010

- "Operator Algebras and Conformal Field Theory" (2 talks), MIT, Cambridge USA, March 2011

- "Operator Algebras and Conformal Field Theory", (mini-course at the school on Noncommutative Geometry and Conformal Field Theory), RIMS Kyoto, December 2011

- "Operator Algebras and Conformal Field Theory", (mini-course at the XXth Oporto Meeting on Geometry, Topology and Physics), Oporto, July 2012

- "An Analog of the Beurling-Lax Theorem and Quantum Field Theory" (colloquium), Münster, May 2012

- "The Importance of Being Noncommutative", Opening of the PhD schools in Mathematics and in Biomolecular Science, Trento, February 2013

- "Operator Algebras and Conformal Field Theory", (mini-course at the XXth Oporto Meeting on Geometry, Topology and Physics), Oporto, July 2012

- "Operator Algebras and Quantum Field Theory" (colloquium), Beijing, Academy of Science, July 2015

- Laudatio on the occasion of the Laurea Honoris Causa to Vaughan Jones, Rome June 2016

- "Operator Algebras and Conformal Field Theory", (mini-course at the Mathematical Society of Japan - Seasonal Institute, Operator Algebras and Mathematical Physics), Tohoku University, Sendai, August 2016

- "Kubo-Martin-Schwinger, Non-equilibrium thermodynamics and Conformal Field Theory", Paul Martin Memorial, Harvard University, Cambridge, October 2016

- "Operator Algebras and Conformal Field Theory", (mini-course at the Newton Institute) Cambridge, January 2017

- "Matematica e Fisica al crocevia" - Colloquium di Macroarea (joint with M. Bianchi) Roma Tor Vergata, May 2017

- "Standard Subspaces", (two talks) North British Functional Analysis Seminar, Centre for Mathematical Sciences, Cambridge May 2017

- "Modular Theory and Entropy Bounds in Physics", Operator Algebras at UCLA, a celebration of Masamichi Takesaki, Los Angeles, April 2018

- Plenary speaker at "Strings 2018", Okinawa, June 2018

- "Noncommutativity, time and entropy bounds", IRAFS workshop on "The origins and evolution of spacetime", Pontifical Lateran University - November 2018

- "The emergence of time", Danish Institute for Advanced Study (public lecture) – September 2019

- "The emergence of time", (colloquium), Muenster University – January 2020

- "The information in a wave", (on line talk), Mathematical Picture Language Project Seminar, Harvard University, May 2020

Organization of international conferences (from 2006)

"Brazilian Operator Algebras Conference" Florianopolis, July 2006.

"Recent Advances in Operator Algebras", INDAM, Rome, November 2006 (scientific committee)

"Conference on Geometry and Operator Theory", Ancona, September 2007 (scientific committee)

"Operator Algebras, Conformal Field Theory and related topics", Schrödinger Institute, Vienna, Sept. 2008

"Quantum Spacetime and Noncommutative Geometry", Rome, September-October 2008

"Noncommutative Geometry and Quantum Field Theory", Rome, October 2008

"Noncommutative Geometry and Quantum Physics", Vietri sul Mare, September 2009

"Quantum Systems", ICM 2010 satellite conference, Chennai, August 2010

"Seminal Interactions between Mathematics and Physics", Accademia dei Lincei, Rome, September 2010

Member of the scientific committee of "Noncommutative Geometry", Cortona, June 2012

"Mathematical Aspects of Quantum Field Theory and Quantum Statistical Mechanics", Hamburg, July 2012

"Noncommutative Geometry and Applications to Physics", Milan, December 2012 (scientific committee)

"Operator and Geometric Analysis on Quantum Theory", CIRM, Levico September 2014

"Gauge Theory, Strings and Holography", INdAM, Roma, Italy, June , 2016

"Operator Algebras and Quantum Field Theory", INFN, Frascati 2016

"Mathematics and Physics at the Crossroad", Giornata conclusiva, INdAM October 2016

"Subfactors, K-theory and conformal field theory ", Cambridge, Newton Institute, June 2017

"Advances in Mathematics and Theoretical Physics", Accademia dei Lincei, Rome, September 2017

"Quantum Information and Operator Algebras", Rome, INdAM February 2018

"Foundations and Constructive Aspects of QFT", 43rd LQP workshop, Galileo Galilei Institute, Florence February 2019

"Operator Algebras and Applications", Simons Center, Stony Brooks, June 2019 (with S. Hollands, V. Jones and G. Lechner)

Organization of international research programs and congresses (from 2006)

Focussed Research Team "Infinite dimensional Lie algebras and local von Neumann algebras in CFT", BIRS, Banff, May 2006 (with V.G. Kac)

International Congress on Mathematical Physics, (Operator Algebras session org.), Rio de Janeiro, Aug 2006

Semester on "Operator Algebras and Conformal Field Theory", Erwin Schrödinger Institute, Vienna, August-December 2008 (with Y. Kawahigashi and K.-H. Rehren)

Fourteenth Marcel Grossmann Meeting – MG14, Rome, July 2015 (local organizing committee)

INdAM Intensive Period "Mathematics and Physics at the Crossroad", INFN, Frascati June-October 2016 2016 (organizing committee)

Program "Operator Algebras", Newton Institute, Cambridge, January-June 2017 (scientific advisory board member)

Fifteenth Marcel Grossmann Meeting – MG15, Rome, July 2018 (local organizing committee)

Program "Operator Algebras and Quantum Physics", Simons Center, Stony Brooks, June 2019 (with S. Hollands, V. Jones and G. Lechner)

Other services

National coordinator of the Italian PRIN research network "Operator Algebras"

Italian coordinator (pro-tempore) of the European Research Training Network "Noncommutative Geometry"

Referee for CIRV, "Comitato di Indirizzo per la Valutazione della Ricerca"

Referee for ANVUR, "Italian National Agency for the Evaluation of Universities and Research Institutes"

Referee for the European Research Council

Referee for European Commission

Referee for the Italian PRIN

Referee for the National Science Foundations of several countries

Panel member for the National Science Foundation, USA

Member of the Editorial Board of SIGMA (Symmetry, Integrability and Geometry: Methods and Applications)

Member of the scientific committee of the France-Italy network GREFI-GENCO INDAM network "Noncommutative Geometry"

Member of the PhD school in Mathematics board, Roma Tor Vergata

Member of hiring committees for Full and Associate Professors, Researchers, Postdocs.

Referee for major mathematical journals, e.g. Advances in Mathematics, Communications in Mathematical Physics, Inventiones Mathematicae, Journal of Functional Analysis.

Referee for the Kyoto Prize
Member of the panel for the creation of the MAECI Italian School of Advanced Science of Kyoto.

Publications of Roberto Longo

1. Longo R., *A simple proof of the existence of the modular automorphisms in approximately finite dimensional von Neumann algebras*, Pacific Journal of Mathematics 70 (1978), 199.

2. Longo R., *On perturbed derivations of C*-algebras*, Reports on Mathematical Physics 12 (1977), 1.

3. Longo R., *Automatic relative boundedness of derivations of C*-algebras*, Journal of Functional Analysis, 34 (1979), 21.

4. Longo R., *Some aspects of C*-dynamics*, Colloque Internationaux du CNRS n. 274, (1979).

5. Longo R., *Notes on algebraic invariants for non-commutative dynamical systems*, Communications in Mathematical Physics 69 (1979), 47.

6. D'Antoni C., Longo R., Zsido L., *A spectral mapping theorem for locally compact groups of operators*, Pacific Journal of Mathematics, 103 (1980), 17-24.

7. Herman R., Longo R., *A note on the spectrum of an automorphism group*, Duke Mathematical Journal 47, (1980), 27.

8. Longo R., *A remark on crossed product of algebras*, Journal of the London Mathematical Society (2) 23, (1981), 531.

9. Longo R., *Simplicity of the crossed product and the derivations theorem*, Bollettino dell'Unione Matematica Italiana 18 A(1981), 417-422.

10. Hislop P.D., Longo R., *Modular structure of the von Neumann algebras associated to the free massless scalar field theory*, Communications in Mathematical Physics, 84 (1982), 71-85.

11. Longo R., *Algebraic and modular structure of von Neumann algebras of Physics*, Proceedings of Symposia in Pure Mathematics 38, (1982), Part 2, 551.

12. Longo R., *Modular automorphism local algebras in quantum field theory*, VI International Conference on Mathematical Physics held in Berlin, August 11-20-1981 Lecture Notes in Physics, 153, (1982), 372, Springer.

13. D'Antoni C., Longo R., *Interpolation by type I factors and the flip automorphism*, Journal of Functional Analysis 51, (1983), 361.

14. Doplicher S., Longo R., *Local aspects of superselection rules II*, Communications in Mathematical Physics 88, (1983), 361.

15. Doplicher S., Longo R., *Standard and split inclusions of von Neumann algebras*, Inventiones Mathematicae 75, (1984), 493-536.

16. Longo R., *Solution of the factorial Stone-Weierstrass conjecture*, Inventiones Mathematicae 76, (1984) 145-155.

17. Peligrad C., Longo R., *Non commutative topological dynamics and compact actions on C*-algebras*, Journal of Functional Analysis 58, (1984), 157.

18. Longo R., *Remarks on pseudonormalcy*, in Lecture Notes in Mathematics n. 1139, Springer-Verlag, (1985), 347-349.

19. Longo R., *Simple and rigid injective subfactors*, Proceedings of the conference on C*-Algebras, MSRI, Berkeley (1985).

20. Buchholz D., Doplicher S., Longo R., *On Noether's theorem in quantum field theory*, Annals of Physics 170 (1986), 1-17.

21. D'Antoni C., Doplicher S., Fredenhagen K., Longo R., *Convergence of local charges and continuity properties of W*-inclusions*, Communications in Mathematical Physics 110 (1987), 325-348.

22. Longo R., *Simple injective subfactors*, Advances in Mathematics 63 (1987), 152-171.

23. Longo R., *The joint modular structure for inclusions of von Neumann algebras*, Contemporary Mathematics 62, (1987), 529-538.

24. Longo R., *Inclusions of von Neumann algebras and Quantum Field Theory*, in: "International Conference on Mathematical Physics", B. Simon, A. Truman, I.M. Davis editors Swansea (1988),

Adam Hilger, Briston and New York.

25. Longo R., *Maximal abelian subalgebras with simple normalizer*, Proceedings of the American Mathematical Society, 107 (1989), 165-168.

26. Longo R., *Restricting a compact action to an injective subfactor*, Ergodic Theory and Dynamical Systems, 9 (1989), 127-135.

27. Buchholz D., D'Antoni C., Longo R., *Nuclear maps and modular structures I. General properties*, Journal of Functional Analysis 88 (1990), 223-250.

28. Longo R., *Index of subfactors and statistics of quantum fields. I,* Communications in Mathematical Physics 126 (1989), 217-247.

29. Buchholz D., D'Antoni C., Longo R., *Nuclear maps and modular structures. II Applications to quantum field theory,* Communications in Mathematical Physics 129 (1990), 115-138.

30. Longo R., *Index of subfactors and statistics of quantum fields. II: Correspondences, braid group statistics and Jones polynomial*, Communications in Mathematical Physics 130 (1990), 285-309.

31. Longo R., *Index theory of subfactors and braid group statistics*, in "Algebraic theory of superselection sectors", D. Kastler ed. World Scientific (1990).

32. Kosaki H., Longo R., *A remark on the minimal index of subfactors*, Journal of Functional Analysis 107 (1992), 458-470.

33. Longo R., *Minimal index and braided subfactors*, Journal of Functional Analysis 109 (1992), 98-112.

34. Guido D., Longo R., *Relativistic invariance and charge conjugation in Quantum Field Theory,* Communications in Mathematical Physics 148 (1992), 521-551.

35. Buchholz D., Doplicher S., Longo R., Roberts J.E., *A new look at Goldstone theorem*, Reviews in Mathematical Physics, Special Issue (1992) 49-83.

36. Accardi L., Longo R., *Martingale convergence of generalized conditional expectations*, Journal of Functional Analysis 118 (1993), 119-130.

37. Buchholz D., Doplicher S., Longo R., Roberts J.E., E*xtensions of automorphisms and gauge symmetries*, Communications in Mathematical Physics 155 (1993), 123-134.

38. Longo R. *Minimal index and unimodular sectors*, in Proceedings of International Symposium on "Quantum and Non-Commutative Analysis", ed. H. Araki et al., Kluwer Academic Publishing Co. 335-340 (1993). 2

39. Brunetti R., Guido D., Longo R., *Modular structure and duality in conformal Quantum Field Theory*, Communications in Mathematical Physics 156 (1993), 201-219.

40. Longo, R., *Problems on von Neumann algebras suggested by Quantum Field Theory*, in: "Subfactors", Proceedings of the Taneguchi symposium, Kyoto 1993.

41. Longo R., *Algebre di Operatori*, voce quadro per il Dizionario delle Scienze Fisiche, Enciclopedia Treccani (1993).

42. Longo R., *A duality for Hopf algebras and for subfactors. I*, Communications in Mathematical Physics 159 (1994), 133-150.

43. Brunetti R., Guido D., Longo R., *Group cohomology, modular theory and space-time symmetries*, Reviews in Mathematical Physics 7 (1995), 57–71.

44. Guido D., Longo R., *An algebraic spin and statistics theorem. I*, Communications in Mathematical Physics 172 (1995), 517-533.

45. Longo R., Rehren K.H., *Nets of subfactors,* Reviews in Mathematical Physics 4 (1995), 567-597.

46. Longo R., *von Neumann algebras and Quantum Field Theory*, Proceeding of the International Congress of Mathematicians, Zürich 1994 - Birkhauser, Basel, Switzerland 1995.

47. Longo R., *Inclusions of von Neumann algebras and superselection structure,* Proceeding of the International Congress of Mathematical Physics, Parigi 1994, International Press, Cambridge 1995.

48. Guido D., Longo R., *The conformal spin and statistics theorem*, Communications in Mathematical Physics 181, 11-35, (1996).

49. Longo, R., Roberts, J.E., A *Theory of Dimension,* K-Theory 11 (1997), 103-159.

50. Longo R., *On the spin-statistics relation for topological charges*, Proceedings of the conference 'Operator algebras and quantum Field Theory', Rome, July 1996, International Press, Cambridge 1997.

51. Doplicher S., Longo R., Roberts J.E., Zsido L. editors, "Operator Algebras and Quantum Field Theory", Proceedings of the conference held in Rome, Accademia dei Lincei, July 1996.

International Press, Cambridge 1997.

52. Longo R., *An analogue of the Kac-Wakimoto formula and black hole conditional entropy,* Communications in Mathematical Physics 186 (1997), 451-479.

53. Izumi M., Longo R., Popa S., *A Galois correspondence for compct groups of automorphisms of von Neumann algebras with a generalization to Kac algebras*, Journal of Functional Analysis 155 (1998), no. 1, 25–63.

54. Bertozzini P., Conti R., Longo R., *Covariant sectors and positivity of the energy*, Communications in Mathematical Physics 141 (1998), 471-492.

55. Guido D., Longo R., Wiesbrock H.W. *Extensions of conformal nets and superselection structure,* Communications in Mathematical Physics 192 (1998), 217-244.

56. D'Antoni C., Longo R., Radulescu F., *Conformal nets, maximal temperature and models from free probability,* Journal of Operator Theory 45 (2001), 217-244.

57. Longo R. *The Bisognano-Wichmann theorem for charged states and the conformal boundary of a black hole,* Electronic Journal of Differential Equations, Conf. 04, 2000, pp. 159-164.

58. Kawahigashi Y., Longo R., Müger, M. *Multi-interval subfactors and modularity of representations in conformal field theory*, Communications in Mathematical Physics 219 (2001), 631-669.

59. Buchholz D., Longo R. *Graded KMS-functionals and the breakdown of supersymmetry,* Adavances in Theoretical and Mathematical Physics 3, 615-626 (2001). Addendum: ibidem 6, 1909-1910 (2001).

60. Guido D., Longo R., Roberts J.E., Verch R. *Charged sectors, spin and statistics in quantum field theory on curved spacetimes,* Reviews in Mathematical Physics 13 (2001), 125-198

61. Longo R. *Notes for a quantum index theorem,* Communications in Mathematical Physics 222 (2001), 45-96.

62. Guido D., Longo R. *Natural energy bounds in quantum thermodynamics,* Communications in Mathematical Physics 218 (2001), 513-536.

63. Longo R. Editor, "Mathematical Physics in Mathematics and Physics. Quantum and operator algebraic aspect", Fields Institute Communications, Amer. Math. Soc. Providence RI, 2001.

64. Longo R. *Notes for a quantum index theorem*. Introduction, in: "Mathematical Physics in Mathematics and Physics. Quantum and operator algebraic aspects", Fields Institute Communications 30 (2001), 287-296,.

65. Brunetti G., Guido D., Longo R. *Modular localization and Wigner particles,* Reviews in Mathematical Physics 14, N. 7 & 8 (2002), 759-786.

66. Doplicher S., Longo R., Roberts J.E., Zsido L. *A remark on quantum group actions and nuclearity,* Reviews in Mathematical Physics 14, N. 7 & 8 (2002), 787-796.

67. Longo R. *Conformal subnets and intermediate subfactors,* Communications in Mathematical Physics 237 (2003), 7-30.

68. Guido D., Longo R. *A converse Hawking-Unruh effect and dS2/CFT correspondence*, Annales H. Poincaré 4 (2003), 1-51.

69. Kawahigashi Y., Longo R. *Classification of local conformal nets. Case c < 1,* Annals of Mathematics 160 (2004), 493-522.

70. Kawahigashi Y., Longo R. *Classification of two-dimensional local conformal nets with c < 1 and 2-cohomology vanishing for tensor categories,* Communications in Mathematical Physics 244(2004), 63-97.

71. Longo R., Xu F. *Topological sectors and a dichotomy in conformal field theory,* Communications in Mathematical Physics 251 (2004), 321-364.

72. Longo R., Rehren K.H., *Local fields in boundary CFT*, Reviews in Mathematical Physics 16 (2004), 909-960.

73. Doplicher, S., Longo R. eds., "Noncommutative Geometry", C.I.M.E. summer school held at Martina Franca, Italy, September 3-9, 2000, Lecture Notes in Mathematics Vol. 1831, Springer-Verlag, Nerlin-Heidelberg-New York 2004.

74. Kac V. G., Longo R., Xu F., *Solitons in affine and permutation orbifolds,* Communications in Mathematical Physics 253 (2005), 723-764.

75. Kawahigashi Y., Longo R., *Noncommutative spectral invariants and black hole entropy,* Communications in Mathematical Physics 257, 193-225 (2005).

76. Boca F.-P., Bratteli O., Longo R, Siedentop H. eds., "Advances in Operator Algebras and Mathematical Physics", Proceedings of the "20th Conference on Operator Theory", Sinaia, June-

July, 2003, Theta Foundation, Bucharest 2005.

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