

**Curriculum di Roberto Longo ai fini della formazione
delle liste degli aspiranti commissari**

1. Posizione accademica:

a) *settore concorsuale*: 01/A3 - ANALISI MATEMATICA, PROBABILITÀ E STATISTICA MATEMATICA, settore scientifico-disciplinare MAT/05 - ANALISI MATEMATICA;

b) Professore ordinario dal Maggio 1986;

c) Dipartimento di Matematica, Università di Roma Tor Vergata;

d) *posizioni ricoperte*:

10.77 – 09.78 Assistente supplente - Università di Roma La Sapienza

10.78 – 10.80 Assistente di ruolo - Università di Roma La Sapienza

10.79 – 10.80 Professore incaricato - Università di Roma La Sapienza

11.80 – 04.86 Professore Associato - Università di Roma La Sapienza

11.93 – 10.96 “Professore distaccato” – Centro Linceo Interdisciplinare “B. Segre”, Accademia Nazionale dei Lincei (National Academy of Sciences) – Rome

05.86 – Professore Ordinario - Università di Roma Tor Vergata

11.09 – Direttore del Center for Mathematics and Theoretical Physics – Università di Roma Tor Vergata

2. Pubblicazioni scientifiche:

a) *Elenco complessivo delle pubblicazioni.*

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-Weirstrass 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., Extensions 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 compact 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, *Advances 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", Lectures given at the C.I.M.E. summer school held at Martina Franca, Italy, September 3-9, 2000, *Lecture Notes in Mathematics* Vol. 1831, Springer-Verlag, Berlin-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.
77. Longo R. Laudatio in honor of H. Araki. Part of: Longo R., Lebowitz J., Aizenman M., The Henri Poincaré Prize sponsored by the Daniel Jagoitz Foundation. XIVth International Congress on Mathematical Physics, xvii-xxiv, World Sci. Publ., Hackensack, NJ, 2005.
78. Kawahigashi Y., Longo R., Local conformal nets arising from framed vertex operator algebras, *Advances in Mathematics* 206 (2006), 729-751.
79. Kawahigashi Y., Longo R., Pennig, U., Rehren, K.-H., The classification of non- local chiral CFT with $c < 1$, *Communications in Mathematical Physics* 271 (2007), 375 - 385.
80. Buchholz D., D'Antoni C., Longo, R. Nuclearity and thermal states in Conformal Field Theory, *Communications in Mathematical Physics* 270 (2007), 267 - 293.
81. Longo R. Nuclearity in CFT, in: *Micro-Macro Duality in Quantum Analysis*, RIMS Kôkyûroku 1565, Kyoto Univ. 2007
82. Carpi S., Kawahigashi Y., Longo, R., Structure and classification of superconformal nets, *Annales Henri Poincaré* 9 (2008) no. 6, 1069-1121
83. Longo R. Real Hilbert subspaces, modular theory, $SL(2, \mathbb{R})$ and CFT, in: *Von Neumann algebras in Sibiu*, 33-91, Theta Ser. Adv. Math., 10, Theta, Bucharest, 2008.
84. Longo R., Rehren K.H., How to remove the boundary in CFT, an operator algebraic procedure, *Communications in Mathematical Physics* 285 1165-1182 (2009).
85. Brasselet, J.-P., Legrand, A., Longo, R., Mishchenko, A. Collection of materials presented at the Conference "Geometry and Operator Theory" dedicated to N. Teleman's 65th birthday celebration, Ancona, 20-22 September 2007. *Russ. J. Math. Phys.* 16 (2009), no. 3, 345-349.
86. Carpi S., Hillier, R. Kawahigashi Y., Longo, R., Spectral triples and the super-Virasoro algebra, *Communications in Mathematical Physics* 295 (2010), 71-97.
87. Longo, R., Martinetti, P., Rehren K.H., Geometric modular action for disjoint intervals and boundary conformal field theory, *Reviews in Mathematical Physics* 22 (2010), 331-354.
88. Carpi, S., Kawahigashi, Y., Longo, R., On the Jones index for conformal subnets, *Letters in Mathematical Physics*, 92 (2010), no. 2, 99-108.
89. Longo R., Witten E., An algebraic construction of boundary Quantum Field Theory, *Communications in Mathematical Physics* 303 (2011) , 213-232.

90. Longo R., Rehren K.H., Boundary Quantum Field Theory on the interior of the Lorentz hyperboloid, *Communications in Mathematical Physics* 311, no. 3 (2012), 769-785.
91. Camassa P., Longo R., Tanimoto, Y. Weiner, M., Thermal states in Conformal Field Theory. I, *Communications in Mathematical Physics* 309 (2012), no. 3, 703-735.
92. Camassa P., Longo R., Tanimoto Y., Weiner M., Thermal states in Conformal Field Theory. II, *Communications in Mathematical Physics* 315 (2012), 771-802.
93. Carpi S., Hillier R., Longo R., Superconformal nets and Noncommutative Geometry, *Journal of Noncommutative Geometry* (in press).
94. Carpi S., Kawahigashi Y., Longo R., How to add a boundary condition, *Communications in Mathematical Physics* 322 (2013), 149–166.
95. Carpi S., Hillier R., Kawahigashi Y., Longo R., Xu F., N=2 Superconformal Nets, *Communications in Mathematical Physics* (in press) DOI 10.1007/s00220-014-2234-3.
96. Lechner G., Longo R. Localization in nets of standard spaces, *Communications in Mathematical Physics* (in press) (DOI) 10.1007/s00220-014-2199-2
97. Bischoff M., Kawahigashi Y., Longo, R. Rehren K.H., Phase boundaries in algebraic conformal QFT, arXiv:1405.7863 [math-ph].
98. Bischoff M., Kawahigashi Y., Longo, R. Rehren K.H., Tensor categories and endomorphisms of von Neumann algebras, *SpringerBriefs in Mathematics* (in press).
99. Bischoff M., Kawahigashi Y., Longo, Characterization of 2D rational local conformal nets and its boundary conditions: the maximal case, arXiv:1410.8848 [math.OA]

b) Principali pubblicazioni.

1. 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.
2. Doplicher S., Longo R., Standard and split inclusions of von Neumann algebras, *Inventiones Mathematicae* 75, (1984), 493-536.
3. Longo R., Solution of the factorial Stone-Weirstrass conjecture, *Inventiones Mathematicae* 76, (1984) 145-155.
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6. Brunetti R., Guido D., Longo R., Modular structure and duality in conformal Quantum Field Theory, *Communications in Mathematical Physics* 156 (1993), 201-219.
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9. Guido D., Longo R., The conformal spin and statistics theorem, *Communications in Mathematical Physics* 181, 11-35, (1996).
10. Longo, R., Roberts, J.E., A Theory of Dimension, *K-Theory* 11 (1997), 103-159.
11. Longo R., An analogue of the Kac-Wakimoto formula and black hole conditional entropy, *Communications in Mathematical Physics* 186 (1997), 451-479.
12. 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.
13. Longo R. Notes for a quantum index theorem, *Communications in Mathematical Physics* 222 (2001), 45-96.
14. Brunetti G., Guido D., Longo R. Modular localization and Wigner particles, *Reviews in Mathematical Physics* 14, N. 7 & 8 (2002), 759-786
15. Kawahigashi Y., Longo R. Classification of local conformal nets. Case $c < 1$, *Annals of Mathematics* 160 (2004), 493-522.
16. Longo R., Xu F. Topological sectors and a dichotomy in conformal field theory, *Communications in Mathematical Physics* 251 (2004), 321-364.
17. Longo R., Rehren K.H., Local fields in boundary CFT, *Reviews in Mathematical Physics* 16 (2004), 909-960.
18. Kac V. G., Longo R., Xu F., Solitons in affine and permutation orbifolds, *Communications in Mathematical Physics* 253 (2005), 723-764.
19. Kawahigashi Y., Longo R., Local conformal nets arising from framed vertex operator algebras, *Advances in Mathematics* 206 (2006), 729-751.
20. Buchholz D., D'Antoni C., Longo, R. Nuclearity and thermal states in Conformal Field Theory, *Communications in Mathematical Physics* 270 (2007), 267 - 293.
21. Longo R. Real Hilbert subspaces, modular theory, $SL(2, \mathbb{R})$ and CFT, in: *Von Neumann algebras in Sibiu, 33-91*, Theta Ser. Adv. Math., 10, Theta, Bucharest, 2008.
22. Carpi S., Hillier, R. Kawahigashi Y., Longo, R., Spectral triples and the super-Virasoro algebra, *Communications in Mathematical Physics* 295 (2010), 71-97.
23. Longo R., Witten E., An algebraic construction of boundary Quantum Field Theory, *Communications in Mathematical Physics* 303 (2011) , 213-232.
24. Camassa P., Longo R., Tanimoto, Y. Weiner, M., Thermal states in Conformal Field Theory. I, *Communications in Mathematical Physics* 309 (2012), no. 3, 703-735.
25. Lechner G., Longo R. Localization in nets of standard spaces, *Communications in Mathematical Physics* (in press) (DOI) 10.1007/s00220-014-2199-2

26. Bischoff M., Kawahigashi Y., Longo, R. Rehren K.H., Phase boundaries in algebraic conformal QFT, arXiv:1405.7863 [math-ph].

3. Titoli:

a) *Responsabilità scientifica per progetti di ricerca:*

Principal Investigator of the Advanced Grant OACFT "Operator Algebras and Conformal Field Theory" by the European Research Council, 1.12.2008 – 30.11.2013

Coordinatore Nazionale del MIUR PRIN (Programma di Ricerca di Rilevante Interesse Nazionale) "Operator Algebras, Noncommutative Geometry and Applications", 1.02.2013 – 31.1.2016 (e precedenti PRIN)

b) *Direzione di enti o istituti di ricerca di alta qualificazione internazionale.* Direttore del Centro di Matematica e Fisica Teorica, Roma

c) *Premi e riconoscimenti per l'attività scientifica*

Fellow of the American Mathematical Society 2013

Convegno in occasione del sessantesimo compleanno, Accademia dei Lincei, Luglio 2013

Humboldt Research Award 2014

d) *Altri titoli*

Invited speaker al Congresso Internazionale dei Matematici, Zurigo, Agosto 1994

Plenary speaker al Congresso Internazionale di Fisica Matematica, Praga, Agosto 2010

Roma, 12 Dicembre 2014

A handwritten signature in black ink, appearing to be 'M. Bischoff', located at the bottom right of the page.