

## Claudio Dappiaggi - April 2024

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Associate Professor  
Dipartimento di Fisica  
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### Personal data

Name and surname: Claudio Dappiaggi  
Place and date of birth: Genève (Switzerland) - 05 August 1977  
Nationality: Italian  
Spoken Languages: Italian, English (Excellent), French (good), German (good), Spanish (basic).

### Education

Ph.D. in Physics (curriculum: mathematical physics), Università di Pavia, February 2004  
Supervisor: Prof. Mauro Carfora (mauro.carfora@pv.infn.it)  
Thesis: *Simplicial and asymptotical aspects of the holographic principle*

Degree in Physics, Università di Pavia, 24/03/2000 *Summa Cum Laude*  
Supervisor: Prof. Mauro Carfora  
Thesis: *Applicazioni del principio olografico in fisica gravitazionale* (transl. Applications of the holographic principle in gravitational physics)

### Research and Academic Positions

- **Deputy Coordinator of the PhD School in Physics** from October 2021 at the Department of Physics of the University of Pavia (Italy)
- **Associate Professor in mathematical physics (MAT/07)** from 01/12/2019 at the Department of Physics of the University of Pavia (Italy)
- Adjunct Professor/Researcher - Permanent Staff Member in mathematical physics (MAT/07) from 29/12/2010 till 30/11/2019 at the Department of Physics of the University of Pavia (Italy)
- Postdoc Fellow from 01/04/2010 until 30/12/2010 at the II. Institut für Theoretische Physik - University of Hamburg
- Junior Fellow from 01/10/2009 (until 31/03/2010) at the Erwin Schrödinger Institute for Mathematical Physics - Wien
- Humboldt Fellow since 01/09/2007 (until 30/09/2009) at the II. Institut für Theoretische Physik - University of Hamburg
- Research Contract from 01/04/2007 to 31/05/2007: Dipartimento di Fisica - Università di Pavia
- Research Contract from 01/10/2006 to 31/12/2006: Dipartimento di Scienze e Tecnologia Avanzate - Università del Piemonte Orientale (project leader: Prof. Roberto Catenacci - e-mail:catenacc@unipmn.it)
- Research Contract from 01/08/2006 to 30/09/2006: Dipartimento di Fisica - Università di Pavia
- Postdoc Grant from 01/07/2004 to 31/07/2006: Dipartimento di Fisica - Università di Pavia
- Visiting Ph.D. from 01/01/2003 to 31/07/2003: Spinoza Institute - Utrecht University
- Ph.D. Student from 01/11/2000 to 15/02/2004: Dipartimento di Fisica - Università di Pavia

## Longer Term Visits

Host: Professor Valter Moretti

11-25 Feb. 2005  
Department of Mathematics - University of Trento

Host: Professor Martin Poppmann

23-30 May 2009  
Centre for Quantum Technologies - University of Durban (South Africa)

Host: Professor Thorsten Ohl

28 June - 02 July 2010  
Institut für Theoretische Physik - Universität Würzburg

Host: Professor Felix Finster

17-22 Nov. 2014 and 11-22 May 2015  
Department of Mathematics - University of Regensburg

## Active Collaborations

I am collaborating on one or more projects with members of the following institutions:

- Department of Mathematics - Heriot-Watt University
- Dipartimento di Matematica - Università di Trento
- Dipartimento di Matematica - Università di Genova
- Dipartimento di Matematica - Università di Roma Tor Vergata
- Departamento de Física Matemática - Universidad Nacional Autónoma de Mexico
- Department of Mathematics - University of Nottingham
- Department of Mathematics - Universität Regensburg

## Awards, Honors and Funding

- **National qualification (Habilitation) for associate and for full professor in mathematical physics (01/A4), both renewed in 2018 .**
- FFARB (Finanziamento delle Attività Base della Ricerca) 2017
- Erasmus Plus Fellowship at the University of Regensburg in 2015.
- Member of the PRIN “Geometric and analytic theory of Hamiltonian systems in finite and infinite dimensions” (2013-2016) - national coordinator: Boris Dubrovin
- Member of the project “*Influenza della materia quantistica sulle fluttuazioni gravitazionali*” funded by the GNFM-Indam (National Group for Mathematical Physics) in 2013.
- PI of the project “*Topological effects and construction of quantum field theories*” funded by the GNFM-Indam (National Group for Mathematical Physics) in 2012.
- PI of the project “Modern Trends in AQFT” financed by the DAAD (Deutscher Akademischer Austauschdienst) and by the “Ateneo Italo-Tedesco”,
- Member of the project “*Stati quantistici di Hadamard e radiazione di Hawking da buchi neri rotanti*” funded by the GNFM-Indam (National Group for Mathematical Physics) in 2010.
- *ESI Fellow* for the winter semester Oct.2009-Mar.2010,
- *Humboldt Fellow* from the 01st of October 2007 until the 30th of September 2009,

- *Sigrav Prize 2006* as “outstanding young researcher” awarded from the *Italian Society of Gravitational Physics*,
- Research responsible for the project “*Olografia e spazitempo asintoticamente piatti: un approccio rigoroso*” funded by the GNFM-Indam (National Group for Mathematical Physics) in 2007.

## Books

1. Author with Valter Moretti and Nicola Pinamonti of *Hadamard States and the Bulk-to-Boundary Correspondence* – SpringerBriefs **25** Springer-Verlag (2017), arXiv:1706.09666 [math-ph]
2. Author and Editor together with Romeo Brunetti, Klaus Fredenhagen and Jakob Yngvason of *Advances in Algebraic Quantum Field Theory* – Springer-Verlag (2015)

## Publication List – Peer reviewed and preprints

1. C. Dappiaggi, F. Nava and L. Sinibaldi, “On the interplay between boundary conditions and the Lorentzian Wetterich equation,” [arXiv:2401.07130 [math-ph]].
2. A. Bonicelli, C. Dappiaggi and P. Rinaldi, “On the stochastic Sine-Gordon model: an interacting field theory approach,” [arXiv:2311.01558 [math-ph]].
3. A. Bonicelli, B. Costeri, C. Dappiaggi and P. Rinaldi, “A microlocal investigation of stochastic partial differential equations for spinors with an application to the Thirring model,” [arXiv:2309.16376 [math-ph]].
4. L. d. Campos, C. Dappiaggi and L. Sinibaldi, “Boundary conditions and infrared divergences,” Phys. Lett. B **848** (2024), 138348 [arXiv:2308.01281 [hep-th]].
5. A. Bonicelli, C. Dappiaggi and N. Drago, “An algebraic correspondence between stochastic differential equations and the Martin-Siggia-Rose formalism,” [arXiv:2302.10579 [math-ph]].
6. L. d. Campos, C. Dappiaggi and L. Sinibaldi, “Physical significance of generalized boundary conditions: an Unruh-DeWitt detector viewpoint on  $\text{PAdS}_2 \times \mathbb{S}^2$ ,” Phys. Lett. B **836** (2023), 137597, [arXiv:2210.02395 [hep-th]].
7. L. d. Campos, C. Dappiaggi and L. Sinibaldi, “Hidden freedom in the mode expansion on static spacetimes,” Gen. Rel. Grav. **55** (2023) no.3, 50, [arXiv:2207.08662 [gr-qc]].
8. C. Dappiaggi, P. Rinaldi, F. Sclavi, “Besov Wavefront Set,” Anal. Math. Phys. **13**, (2023), 95 [arXiv:2206.06081 [math-ph]].
9. C. Dappiaggi, B. A. Juárez-Aubry and A. Marta, “Ground state for the Klein-Gordon field in anti-de Sitter spacetime with dynamical Wentzell boundary conditions,” Phys. Rev. D **105** (2022) no.10, 105017 [arXiv:2203.04811 [hep-th]].
10. C. Dappiaggi, F. Finster and M. Oppio, “Linear Bosonic Quantum Field Theories Arising from Causal Variational Principles,” Lett. Math. Phys. **112** (2022), 38, [arXiv:2112.10656 [math-ph]].
11. A. Bonicelli, C. Dappiaggi and P. Rinaldi, “An Algebraic and Microlocal Approach to the Stochastic Non-linear Schrödinger Equation,” Ann. Henri Poinc. **24** (2023) 2443, [arXiv:2111.06320 [math-ph]].
12. C. Dappiaggi, P. Rinaldi, F. Sclavi, “On a Microlocal Version of Young’s Product Theorem,” Manuscripta Mathematica, [arXiv:2104.12423 [math-ph]].  
<https://doi.org/10.1007/s00229-023-01510-6>
13. L. De Souza Campos, C. Dappiaggi and D. Sina, “On the role of boundary conditions within Hořava-Lifshitz gravity,” Phys. Rev. D **104** (2021) no.10, 105008 [arXiv:2103.15391 [hep-th]].
14. C. Dappiaggi and A. Marta, “Fundamental solutions and Hadamard states for a scalar field with arbitrary boundary conditions on an asymptotically AdS spacetimes,” Math. Phys. Anal. & Geom. **24** (2021), 28 [arXiv:2101.10290 [math-ph]].
15. L. de Souza Campos and C. Dappiaggi, “Ground and thermal states for the Klein-Gordon field on a massless hyperbolic black hole with applications to the anti-Hawking effect,” Phys. Rev. D **103** (2021) no.2, 025021 [arXiv:2011.03812 [hep-th]].

16. C. Dappiaggi, N. Drago, P. Rinaldi and L. Zambotti, “A Microlocal Approach to Renormalization in Stochastic PDEs,” *Commun. Contemp. Math.* **24** (2022) no.07, 2150075 [arXiv:2009.07640 [math-ph]].
17. L. de Souza Campos and C. Dappiaggi, “Comments on the anti-Hawking effect on a BTZ black hole spacetime,” *Phys. Lett. B* **816** (2021), 136198 [arXiv:2009.07201 [hep-th]].
18. C. Dappiaggi and A. Marta, “A generalization of the propagation of singularities theorem on asymptotically anti-de Sitter spacetimes,” *Math. Nachr.* **295**, (2022) no 10, 1934-1968 [arXiv:2006.00560 [math-ph]].
19. M. Capoferri, C. Dappiaggi and N. Drago, “Global wave parametrices on globally hyperbolic spacetimes,” arXiv:2001.04164 [math.AP], *J. Math. Anal. Appl.* **490** (2020), 124316
20. C. Dappiaggi, G. Ruzzi and E. Vasselli, “Aharonov-Bohm superselection sectors,” *Lett. Math. Phys.* **110** (2020), 3244 arXiv:1912.05297 [math-ph].
21. C. Dappiaggi, N. Drago and R. Longhi, “On Maxwell’s Equations on Globally Hyperbolic Spacetimes with Timelike Boundary,” arXiv:1908.09504 [math-ph], *Ann. Henri Poinc.* **21** (2020) 2367.
22. C. Dappiaggi, N. Drago and P. Rinaldi, “The algebra of Wick polynomials of a scalar field on a Riemannian manifold,” arXiv:1903.01258 [math-ph], *Rev. Math. Phys.* **32** (2020) no.08, 2050023
23. C. Dappiaggi, F. Finster, S. Murro and E. Radici, “The Fermionic Signature Operator in De Sitter Spacetime,” arXiv:1902.09144 [math-ph], *J. Math. Anal. Appl.* **485** (2020) 123808.
24. C. Dappiaggi, and F. Finster, “Linearized Fields for Causal Variational Principles: Existence Theory and Causal Structure,” arXiv:1811.10587 [math-ph], *Methods Appl. Anal.* **27** (2020), 1-56
25. M. Carfora, C. Dappiaggi, N. Drago and P. Rinaldi, “Ricci Flow from the Renormalization of Nonlinear Sigma Models in the Framework of Euclidean Algebraic Quantum Field Theory,” arXiv:1809.07652 [math-ph], *Commun. Math. Phys.* **374** (2019) no.1, 241
26. F. Bussola and C. Dappiaggi, “Tunnelling processes for Hadamard states through a 2+1 dimensional black hole and Hawking radiation,” arXiv:1806.00427 [gr-qc], *Class. Quant. Grav.* **36** (2019) no.1, 015020.
27. C. Dappiaggi, H. Ferreira and A. Marta, “Ground states of a Klein-Gordon field with Robin boundary conditions in global anti-de Sitter spacetime,” arXiv:1805.03135 [hep-th], *Phys. Rev. D* **98** (2018) no.2, 025005
28. C. Dappiaggi, N. Drago and H. R. C. Ferreira, “Fundamental solutions for the wave operator on static Lorentzian manifolds with timelike boundary,” arXiv:1804.03434 [math-ph], *Lett. Math. Phys.* **109** (2019) no.10 2157
29. C. Dappiaggi, H. R. C. Ferreira and B. A. Juárez-Aubry, “Mode solutions for a Klein-Gordon field in anti-de Sitter with dynamical boundary conditions of Wentzell type,” arXiv:1802.00283 [hep-th], *Phys. Rev. D* **97** (2018) no.8, 085022
30. M. Benini, C. Dappiaggi and A. Schenkel, “Algebraic quantum field theory on spacetimes with timelike boundary,” arXiv:1712.06686 [math-ph], *Ann. Henri Poinc.* **19** (2018) no.8, 2401
31. C. Dappiaggi, H. R. C. Ferreira and C. A. R. Herdeiro, “Superradiance in the BTZ black hole with Robin boundary conditions,” arXiv:1710.08039 [gr-qc], *Phys. Lett. B* **778** (2018) 146.
32. F. Bussola, C. Dappiaggi, H. R. C. Ferreira and I. Khavkine, “Ground state for a massive scalar field in BTZ spacetime with Robin boundary conditions,” arXiv:1708.00271 [gr-qc], *Phys. Rev. D* **96** (2017) no.10, 105016.
33. G. Canepa, C. Dappiaggi and I. Khavkine, “IDEAL characterization of isometry classes of FLRW and inflationary spacetimes,” arXiv:1704.05542 [gr-qc], *Class. Quantum Grav.* **35** (2018) 035013.
34. C. Dappiaggi and H. R. C. Ferreira, “On the algebraic quantization of a massive scalar field in anti-de-Sitter spacetime,” arXiv:1701.07215 [math-ph], *Rev. Math. Phys.* **30** (2018) 1850004.
35. C. Dappiaggi, S. Murro and A. Schenkel, “Non-existence of natural states for Abelian Chern-Simons theory,” arXiv:1612.04080 [math-ph], *J. Geom. Phys.* **116** (2017) 119.

36. M. Benini, M. Capoferri and C. Dappiaggi, “Hadamard states for quantum Abelian duality,” arXiv:1611.10282 [math-ph], *Ann. Henri Poinc.* **18** (2017) no.10, 3325
37. C. Dappiaggi and H. R. C. Ferreira, “Hadamard states for a scalar field in anti-de Sitter spacetime with arbitrary boundary conditions,” arXiv:1610.01049 [gr-qc], *Phys. Rev. D* **94** (2016) no.12, 125016
38. C. Dappiaggi, H. Gimperlein, S. Murro and A. Schenkel, “Wavefront sets and polarizations on supermanifolds,” arXiv:1512.07823 [math-ph], *J. Math. Phys.* **58** (2017) no.2, 023504
39. C. Dappiaggi, N. Drago, “A new deformation argument for Hadamard states via an extended Møller operator,” arXiv:1506.09122 [math-ph], *Lett. Math. Phys.* **106** (2016) no.11, 1587
40. M. Benini and C. Dappiaggi, “Models of free quantum field theories on curved backgrounds” in *Advances in Algebraic Quantum Field Theory*, Springer-Verlag (2015), arXiv:1505.04298
41. C. Dappiaggi “Hadamard States from null Infinity” – invited contribution to *Mathematical Quantum Physics*, published by Birkhäuser Basel, arXiv:1501.04808 [math-ph].
42. C. Dappiaggi, G. Nosari and N. Pinamonti, “The Casimir effect from the point of view of algebraic quantum field theory”, *Math. Phys. Anal. Geom.* **19** (2016), 1, arXiv:1412.1409 [math-ph].
43. C. Dappiaggi and A. Melati, “Curvature fluctuations on asymptotically de Sitter spacetimes via the semiclassical Einstein’s equations,” arXiv:1406.2223 [gr-qc], *Class. Quant. Grav.* **31** (2014) 235006.
44. M. Benini, C. Dappiaggi and S. Murro, “Radiative observables for linearized gravity on asymptotically flat spacetimes and their boundary induced states,” arXiv:1404.4551 [gr-qc], *J. Math. Phys.* **55** (2014) 082301.
45. M. Benini, C. Dappiaggi, T. -P. Hack and A. Schenkel, “A  $C^*$ -algebra for quantized principal  $U(1)$ -connections on globally hyperbolic Lorentzian manifolds,” arXiv:1307.3052 [math-ph], *Comm. Math. Phys.* **332** (2014) 477.
46. M. Benini, C. Dappiaggi and T. -P. Hack, “Quantum Field Theory on Curved Backgrounds – A Primer,” *Int. Jour. Mod. Phys. A* **28** (2013) 1330023, arXiv:1306.0527 [gr-qc], invited review.
47. M. Benini, C. Dappiaggi and A. Schenkel, “Quantized Abelian principal connections on Lorentzian manifolds,” arXiv:1303.2515 [math-ph], *Comm. Math. Phys.* **330** (2014) 123.
48. K. Sanders, C. Dappiaggi and T. -P. Hack, “Electromagnetism, local covariance, the Aharonov-Bohm effect and Gauss’ law,” arXiv:1211.6420 [math-ph], *Comm. Math. Phys.* **328** (2014) 625.
49. M. Benini, C. Dappiaggi and A. Schenkel, “Quantum field theory on affine bundles,” arXiv:1210.3457 [math-ph], *Ann. Henri Poinc.* **15** (2014) 171.
50. C. Dappiaggi, D. Siemssen, “Hadamard States for the Vector Potential on Asymptotically Flat Spacetimes,” *Rev. Math. Phys.* **25** (2013) 1350002, arXiv:1106.5575 [gr-qc].
51. C. Dappiaggi, B. Lang, “Quantization of Maxwell’s equations on curved backgrounds and general local covariance,” *Lett. Math. Phys.* **101** (2012) 265, arXiv:1104.1374 [gr-qc].
52. C. Dappiaggi “Remarks on the Reeh-Schlieder property for higher spin free fields on curved spacetimes,” *Rev. Math. Phys.* **23** (2011) 1035, arXiv:1102.5270 [math-ph].
53. C. Dappiaggi, T. -P. Hack, N. Pinamonti, “Approximate KMS states for scalar and spinor fields in Friedmann-Robertson-Walker spacetimes,” *Ann. Henri Poinc.* **12** (2011) 1449, arXiv:1009.5179 [gr-qc].
54. C. Dappiaggi, T. P. Hack, J. Moller and N. Pinamonti, “Dark Energy from Quantum Matter,” arXiv:1007.5009 [astro-ph.CO].
55. C. Dappiaggi, G. Lechner and E. Morfa-Morales, “Deformations of quantum field theories on spacetimes with Killing vector fields,” *Comm. Math. Phys.* **305** (2011) 99, arXiv:1006.3548 [math-ph]
56. C. Dappiaggi, N. Pinamonti and M. Porrmann, “Local causal structures, Hadamard states and the principle of local covariance in quantum field theory,” *Comm. Math. Phys.* **304** (2011) 459, arXiv:1001.0858 [hep-th]

57. C. Dappiaggi, V. Moretti and N. Pinamonti, “*Rigorous construction and Hadamard property of the Unruh state in Schwarzschild spacetime,*” arXiv:0907.1034 [gr-qc], Adv. Theo. Math. Phys. **15** (2011) 355
58. C. Dappiaggi, T. Hack and N. Pinamonti, “*Remarks on the conformal anomaly for Dirac fields,*”, Rev. Math. Phys. **21** (2009) 1241, arXiv:0904.0612 [math-ph].
59. C. Dappiaggi, V. Moretti and N. Pinamonti, “*Distinguished quantum states in a class of cosmological spacetimes and their Hadamard property,*” J. Math. Phys. **50**, 062304 (2009), arXiv:0812.4033 [gr-qc].
60. C. Dappiaggi, V. Moretti and N. Pinamonti, “*Cosmological horizons and reconstruction of quantum field theories,*” Comm. Math. Phys. **285** (2009) 1129, arXiv:0712.1770 [gr-qc].
61. C. Dappiaggi, K. Fredenhagen and N. Pinamonti, “*Stable cosmological models driven by a free quantum scalar field,*” Phys. Rev. D **77** (2008) 104015, arXiv:0801.2850 [gr-qc].
62. C. Dappiaggi, “*On the Lagrangian and Hamiltonian formulation of a scalar free field theory at null infinity,*” Rev. Math. Phys. **20** (2008) 801, arXiv:math-ph/0607055.
63. C. Dappiaggi, “*Projecting massive scalar fields to null infinity,*” Ann. Henri. Poinc. **9** (2008) 35, arXiv:0705.0284 [gr-qc].
64. M. Carfora, C. Dappiaggi and V. L. Gili, “*Boundary Conformal Field Theory and Ribbon Graphs: a tool for open/closed string dualities,*” JHEP **07** (2007) 21 arXiv:0705.2331 [hep-th].
65. M. Carfora, C. Dappiaggi and V. L. Gili, “*Triangulated surfaces in twistor space: A kinematical set up for open / closed string duality,*” JHEP **12**(2006) 17 [arXiv:hep-th/0607146].
66. C. Dappiaggi, V. Moretti and N. Pinamonti, “*Rigorous steps towards holography in asymptotically flat spacetimes,*” Rev. Math. Phys. **18** (2006) 349 [arXiv:gr-qc/0506069].
67. B. Bertotti, R. Catenacci and C. Dappiaggi, “*The legacy of pseudospheres: from geometry to physics*” Riv. Nuovo Cimento **29** (2006) 1.
68. C. Dappiaggi and S. Raschi, “*Spectroscopy of an AdS Reissner-Nordstroem black hole,*” Int. J. Mod. Phys. D **15** (2006) 439 [arXiv:gr-qc/0507015].
69. B. Bertotti, R. Catenacci and C. Dappiaggi, “*Pseudospheres in geometry and physics: From Beltrami to de Sitter and beyond,*” Rend. Ist. Lombardo A Sci.Mat.Fis.Chim.Geol. **39** (2007) 165 arXiv:math.ho/0506395.
70. C. Dappiaggi, “*Elementary particles, holography and the BMS group,*” Phys. Lett. B **615** (2005) 291 [arXiv:hep-th/0412142].
71. C. Dappiaggi, “*BMS field theory and holography in asymptotically flat space-times,*” JHEP **0411** (2004) 011 [arXiv:hep-th/0410026].
72. G. Arcioni and C. Dappiaggi, “*Holography in asymptotically flat space-times and the BMS group,*” Class. Quant. Grav. **21** (2004) 5655 [arXiv:hep-th/0312186].
73. M. Carfora, C. Dappiaggi and A. Marzuoli, “*The conformal geometry of random Regge triangulations,*” published in ‘Advances in General Relativity and Cosmology’, Giorgio Ferrarese (Ed.) arXiv:gr-qc/0310039.
74. G. Arcioni and C. Dappiaggi, “*Exploring the holographic principle in asymptotically flat spacetimes via the BMS group,*” Nucl. Phys. B **674** (2003) 553 [arXiv:hep-th/0306142].
75. G. Arcioni, M. Carfora, C. Dappiaggi and A. Marzuoli, “*The WZW model on random Regge triangulations,*” J. Geom. Phys. **52** (2004) 137 [arXiv:hep-th/0209031].
76. M. Carfora, C. Dappiaggi and A. Marzuoli, “*The modular geometry of random Regge triangulations,*” Class. Quant. Grav. **19** (2002) 5195 [arXiv:gr-qc/0206077].

## Conference proceedings

1. C. Dappiaggi “*An overview on algebraic quantum field theory*” Proceedings of the Humboldt Kolleg, held in Corfu (September 2015), PoS CORFU **2015** (2016) 098.
2. V. L. Gili, M. Carfora and C. Dappiaggi, “*BCFT and Ribbon Graphs as tools for open/closed string dualities,*” arXiv:0710.5899 [hep-th] in the Proceedings of the 7th International Workshop Lie Theory and Its Applications in Physics held in Varna (Bulgaria) 18-24 (June 2007) - Bulg. J. Phys. **35** (2008) 107.
3. C. Dappiaggi “*Holography in asymptotically flat spacetimes: recent results and perspectives*” Proceedings of the XVII Sigrav Meeting held in Turin 4-7 September 2006 available at <http://www.sigrav.org/Private/Procs.it.php>.
4. C. Dappiaggi, “*Can we implement the holographic principle in asymptotically flat spacetimes?,*” Proceeding of the IV International Symposium on “*Quantum Theory and Symmetries*” Heron Press (2006) ed. V.K. Dobrev arXiv:hep-th/0511020.
5. C. Dappiaggi, “*BMS field theory and the open roads,*” J. Phys. Conf. Ser. **33** (2006) 254.
6. M. Carfora, C. Dappiaggi and V. Gili, “*Simplicial aspects of string dualities,*” AIP Conf. Proc. **751** (2005) 182 [arXiv:hep-th/0410006].
7. G. Arcioni and C. Dappiaggi, “*Holography and BMS field theory,*” AIP Conf. Proc. **751** (2005) 176 [arXiv:hep-th/0409313].

## Other E-prints

1. C. Dappiaggi, “*Simplicial and asymptotical aspects of the holographic principle,*” arXiv:gr-qc/0403072. (Ph.D. thesis)

## Invited Talks

- 24-28/06/2024 - Invited Lecturer at the *Summer School "Analysis, PDEs and Applications"* (Yerevan, Armenia) – “*Microlocal Analysis and Quantum Field Theory*”
- 22/04/2024 - Invited Speaker at the ESI Programme *Carrollian Physics and Holography* (Vienna) – “*Quantum field theory on asymptotically flat spacetimes and the BMS group*”
- 12/04/2024 - Invited Speaker at the IHP Programma *Quantum and classical fields interacting with geometry* (Paris - France) – “*Stochastic Partial Differential Equations and Renormalization à la Epstein-Glaser*”
- 23/02/2024 - Invited Speaker at the Workshop “Microlocal analysis & PDEs: advances and perspectives” (Edinburgh - UK) – “*Stochastic Partial Differential Equations and Renormalization à la Epstein-Glaser*”
- 19/01/2024 - Invited Speaker at the Workshop “AQFT-UK” (Nottingham - UK) – “*Stochastic Partial Differential Equations and Renormalization à la Epstein-Glaser*”
- 02/10/2023 - Invited Speaker at the Workshop “Rough Paths, Quantum Field Theory and Renormalization” (Gjøvik - Norway) – “*Stochastic Partial Differential Equations and Renormalization à la Epstein-Glaser*”
- 17/08/2023 - Universidad Nacional Autónoma de México – “*Stochastic Partial Differential Equations and Renormalization à la Epstein-Glaser*”
- 13/07/2023 - Invited Speaker at the ESI Programme *Spectral Theory and Mathematical Relativity* (Vienna) – “*Fundamental solutions and Hadamard states for a scalar field with arbitrary boundary conditions on an asymptotically AdS spacetime*”
- 07/06/2023 - Department of Mathematics University of Roma “Tor Vergata” – “*Stochastic Partial Differential Equations and Renormalization à la Epstein-Glaser*”
- 08/12/2022 - Department of Mathematics University of Regensburg – “*Stochastic Partial Differential Equations and Renormalization à la Epstein-Glaser*”

- 14/09/2022 - Invited Speaker at the Conference “*Energy conditions in quantum field theory*” in Leipzig – “*Looking into Random Phenomena from the AQFT viewpoint*”
- 20/07/2022 - Invited Speaker at the AMS-EMS Meeting (Grenoble) – “*Fundamental solutions and Hadamard states for a scalar field with arbitrary boundary conditions on an asymptotically AdS spacetime*”
- 11/01/2022 - One World Seminar (IAMP) – “*Stochastic Partial Differential Equations and Renormalization à la Epstein-Glaser*”
- 26/11/2021 - University of Potsdam – “*Stochastic Partial Differential Equations and Renormalization à la Epstein-Glaser*”
- 01/03/2021 - QFG Seminar Series - Université de Cergy-Pontoise – “*A Microlocal Approach to Renormalization in Stochastic PDEs*”
- 03/07/2020 - Joint Mathematical Physics Colloquium Munich-Regensburg – “*Boundary conditions for Maxwell equations on globally hyperbolic spacetimes with timelike boundary*”
- 29/06/2020 - Institute of Physics, University of Leipzig – “*On the construction of global wave parametrices on globally hyperbolic spacetimes*”
- 06/12/2019 - Invited Speaker at the conference “*Operator Algebras in Quantum Field Theory and Quantum Probability*” – University of Rome Tor Vergata – “*The derivation of the Ricci Flow from non linear Sigma models in algebraic quantum field theory*”
- 18-22/11/2019 - Minicourse on “*Algebraic Quantum Field Theory and Ricci Flow*” – Department of Mathematics - University of Potsdam
- 25/06/2019 - Department of Mathematics - University of Nottingham - “*The derivation of the Ricci Flow from non linear Sigma models in algebraic quantum field theory*”
- 31/05/2019 - MITP Programme “*The Mysterious Universe- Dark Matter-Dark Energy-Cosmic Magnetic Fields*” (Mainz)
- 18/03/2019 - Invited Speaker at the DPG Tagung (Munich) in the Mathematical Physics Section - “*The derivation of the Ricci Flow from non linear Sigma models in algebraic quantum field theory*”
- 22/06/2018 - Department of Mathematics University of Regensburg – “*Fundamental Solutions for the wave operator on static Lorentzian spacetimes with timelike boundary*”
- 25/05/2018 - Quantum fields, scattering and spacetime horizons: mathematical challenges (Les Houches) – “*On the role of boundary conditions in the quantization of free field theories*”
- 27/03/2018 - Problemi attuali di fisica teorica (Vietri sul Mare) - “*On the role of boundary conditions in the quantization of scalar fields in AdS spacetime*”
- 02/03/2018 - DISAT - Politecnico di Torino “*On the role of boundary conditions in the quantization of scalar fields in AdS spacetime*”
- 29/01/2018 - Department of Mathematics - University of Freiburg “*Hadamard States for quantum Abelian duality*”
- 06/09/2017 - Department of Mathematics - University of York, - Workshop *Modern Mathematics of Quantum Theory* – “*On the algebraic quantization of a massive scalar field theory in AdS spacetime*”
- 31/08/2017 - Department of Mathematics - University of Nottingham – “*On the algebraic quantization of a massive scalar field theory in AdS spacetime*”
- 27/07/2017 - Department of Mathematics University of Regensburg – “*On the construction of the ground state for a massive scalar field theory in AdS spacetime*”
- 13/04/2017 - Department of Mathematics - Workshop *QFT Day in Milan: mathematical aspects of renormalization*, University of Milan – “*On the construction of the Green operators and of the ground state for a massive scalar field theory in AdS*”
- 02/12/2016 - Department of Mathematics - University of Trento – “*On the construction of the Green operators and of the ground state for a massive scalar field theory in AdS*”



- 03/11/2016 - Department of Mathematics - University of Potsdam – “*On the construction of the Green operators and of the ground state for a massive scalar field theory in AdS*”
- 25/09/2015 - Algebraic Quantum Field Theory on Lorentzian Manifolds - Minisymposium at the Deutsche Mathematiker-Vereinigung (Hamburg) - “*A novel deformation argument for Hadamard state via an extended Møller operator*”
- 20/09/2015 - Workshop “Open problems in theoretical physics: the issue of quantum space-time” (Corfu - Greece) - “*An overview on algebraic quantum field theory on curved spacetimes*”
- 09/09/2015 - Programme “Modern Theory of Wave equations” (ESI - Vienna) - “*A novel deformation argument for Hadamard state via an extended Møller operator*”
- 20/07/2015 - Conference “Operator Algebras and Quantum Physics” (Sao Paolo (Brazil) - ICMP Satellite Meeting) - “*A novel deformation argument for Hadamard state via an extended Møller operator*”
- 14/07/2015 - Marcel Grossman meeting (Rome - La Sapienza) - “*A novel deformation argument for Hadamard state via an extended Møller operator*”
- 31/03/2015 - Workshop “Problemi attuali di fisica teorica” (Vietri sul Mare) - “*Remarks on the Casimir effect from the point of view of algebraic quantum field theory*”
- 11/02/2015 - Conference “New trends in Algebraic Quantum Field Theory” - “*Curvature Fluctuations in Asymptotically de Sitter Spacetimes*”
- 21/11/2014 - Oberseminar Analysis at the Department of Mathematics - University of Regensburg
- 20/11/2014 - Colloquium at the Department of Mathematics - University of Regensburg
- 30/10/2014 - Department of Mathematics - University of Milan - “*The Casimir effect from the point of view of algebraic quantum field theory*”
- 29/09/2014 - Conference “Quantum Mathematical Physics” (Regensburg) - “*On the construction of Hadamard states from null infinity*”
- 15/09/2014 - Meeting “Operator and Geometric Analysis on Quantum Theory” (Trento) - “*Remarks on the Casimir effect from the point of view of algebraic quantum field theory*”
- 03/07/2014 - Conference “Asymptotic Analysis in General Relativity” (Grenoble) - “*On the role of asymptotic structures in the construction of quantum states*”
- 25/10/2013 PRIN meeting - Università di Roma 3 - “*On the phase space of Maxwell’s equations*”
- 22/07/2013 Conference “New Crossroads between Mathematics and Quantum Field Theory” - MFO (Oberwolfach) - “*Hadamard states from null boundaries*”
- 22-26/04/2013 Conference “Variational and spectral methods in Quantum Field Theory” - IHP (Paris) - “*The principle of general local covariance and the quantization of electromagnetism*”
- 06/02/2013 Workshop “Nonlinear waves and integrable systems 2013” - Sissa (Trieste) - “*Hyperbolic PDEs and algebraic quantum field theory*”
- 16/11/2012 Workshop “Perspectives of Fundamental Cosmology” - Nordita (Stockholm) - “*Quantum field theory on curved backgrounds and Hadamard states*”
- 16/11/2012 Workshop “Perspectives of Fundamental Cosmology” - Nordita (Stockholm) - “*Stable cosmological models and the semiclassical Einstein’s equations*”
- 26-28/09/2012 Workshop “Algebraic Quantum Field Theory and local symmetries” - Hausdorff Research Center for Mathematics (Bonn) - “*New insights the quantization of Maxwell’s equations on curved backgrounds*”
- 12/09/2012 Workshop “New Trends in Algebraic Quantum Field Theory” - Center for Mathematical Physics (Frascati - Rome) - “*New insights the quantization of Maxwell’s equations on curved backgrounds*”

- 13/04/2012 Convegno di Fisica Matematica in onore di Roberto Catenacci - University of Piemonte Orientale (Alessandria): *“The Bertotti-Robinson Universe and the quantization of Maxwell’s equations on curved backgrounds”*
- 26/09/2011 Workshop “Rigorous Quantum Field Theory in the LHC Era” - Erwin Schrödinger Institute (Vienna): *“On the quantization of Maxwell’s equations on curved backgrounds”*
- 05/07/2011 University of Hamburg: *“The surprises of the quantization of Maxwell’s equations on curved backgrounds”*
- 26/05/2011 University of Genova: *“On higher spin fields and their quantization on curved backgrounds”*
- 24/05/2011 Workshop “Noncommutativity and Physics: Spacetime Quantum Geometry” - Bayrischzell (Germany) *“Deformation of quantum field theories and curved backgrounds”*
- 21/02/2011 University of Utrecht: *“On the Contribution of Free Fields to  $\Lambda$ CDM”*
- 24/08/2010 Workshop “Quantum Field Theory on Curved Spacetime - From the Algebraic Approach to Local Covariance” (Durban): *“Local causal structures, local Hadamard states and local covariance”*
- 28/06-02/07/2010 University of Würzburg: course on *“Introduction to quantum field theory on curved backgrounds”*
- 12/05/2010 University of Hamburg: *“From local causal structures to Hadamard states”*
- 29/03/2010 Workshop “Problemi attuali di fisica teorica” - (Vietri sul Mare): *“Beyond the event horizon: the Hadamard property of the Unruh state”*
- 25/03/2010 Workshop “Quantum Field Theory on curved spacetimes” - (ESI, Vienna): *“Beyond the event horizon: the Hadamard property of the Unruh state”*
- 29-30/01/2010 University of Leipzig: speaker in the Mitteldeutsche Physik Combo, giving a course entitled: *“Introduction to Quantum Field Theory on curved Backgrounds with the algebraic formalism - part II”*
- 26/01/2010 University of Vienna: *“Examples and explicit construction of Hadamard states”*, final lecture of the course “Quantum field theory over curved backgrounds”
- 13/01/2010 University of Hamburg: *“Peeking through the horizon: the Hadamard property of the Unruh state”*
- 08-09/01/2010 University of Jena: speaker in the Mitteldeutsche Physik Combo, giving a course entitled: *“Introduction to Quantum Field Theory on curved Backgrounds with the algebraic formalism - part I”*
- 03/12/2009 University of Vienna: *“An application of semiclassical Einstein’s equations in cosmology”*
- 24-25/06/2009 University of Leipzig: mini-course *“On the role of asymptotic structures in quantum field theory over curved backgrounds”*
- 29/05/2009 University of Durban: *“Distinguished quantum ground state in Friedmann-Robertson-Walker spacetimes”*
- 27/05/2009 University of Durban: *“From semiclassical Einstein’s equations to cosmology”*
- 23/04/2009 SFB Colloquium (Hamburg): *“Algebraic quantum field theory meets cosmology”*
- 03/03/2009 SFB Meeting (Bergedorf): *“Algebraic quantum field theory meets cosmology”*
- 23/02/2009 University of Pavia: *“Quantum field theory over curved backgrounds and cosmology”*
- 14/01/2009 University of Hamburg: *“Distinguished ground states in cosmological spacetimes”*
- 27/05/2008 Department of Mathematics - York University: *“Mathematical aspects of the holographic principle”*

- 11/01/2008: Courant Center - Universität Göttingen: *“Formal Aspects of the Holographic Principle in Asymptotically Flat Spacetimes”*
- 24/10/2007 University of Hamburg: *“The road to holography in asymptotically flat spacetimes”*
- 10/05/2007 Department of Mathematics - Heriot Watt University (Edinburgh): *“The holographic principle and asymptotically flat spacetimes”*
- 28/11/2006 Department of Advanced Sciences and Technologies - Università del Piemonte Orientale (Alessandria) *“Holography and asymptotically flat spacetimes: results and perspectives”*.
- 04/09/2006 Sigrav Meeting (Turin) - *“Exploring holography in asymptotically flat spacetimes via the BMS group”*
- 11/05/2006 Department of Physics - Università di Como *“The holgraphic principle in asymptotically flat spacetimes: new results and perspectives,”*
- 6/04/2006 Assemblea Nazionale GNFM: *“Quantum field theory and holography on the null boundary of an asymptotically flat spacetime”*
- 14/08/2005 QTS-4 Conference held in Varna: *“The neverending quest of holography in asymptotically flat space-times”*
- 28/01/2005 Department of Physics - Università di Trento *“The Quest for holography in asymptotically flat spacetimes”*

### Contributed Talks

- 08 July 2022: 22th International Conference on General Relativity and Gravitation - Beijing: *“Anti-Hawking Effect and Robin Boundary Conditions”*
- 03 August 2021 - XX International Congress in Mathematical Physics (Geneva) *“Stochastic Partial Differential Equations and Renormalization à la Epstein-Glaser”*
- 27 July 2018: XIX International Congress in Mathematical Physics (Montréal) *“On the canonical commutation relations for the wave operator on static Lorentzian manifolds with timelike boundary”*
- 09 July 2013: 20th International Conference on General Relativity and Gravitation - Warsaw: *“On the algebraic quantization of Abelian gauge theories on curved spacetimes”*
- 01 June 2013: 32nd Workshop on Foundation and Constructive Aspects of QFT - Wuppertal: *“The principle of general local covariance and the quantization of Abelian gauge theories”*
- 08 August 2012: XVII International Congress in Mathematical Physics (Aahrus) *“New insights the quantization of Maxwell’s equations on curved backgrounds”*
- 05 August 2009: XVI International Congress in Mathematical Physics (Prague) *“Studying the back-reaction of quantum scalar fields in a cosmological scenario”*
- 12 March 2009: DPG Tagung - München *“A novel point of view on the conformal anomaly of quantised Dirac fields”*
- 27 June 2008: 40th Symposium on Mathematical Physics - Torun: *“Cosmological Horizons and Reconstruction of Quantum Field Theories”*
- 07 June 2008: 22nd Workshop on Foundation and Constructive Aspects of QFT - Hamburg: *“Cosmological Horizons and Reconstruction of Quantum Field Theories”*
- 30 June 2007: 20th Workshop on Foundation and Constructive Aspects of QFT - Leipzig: *“Projecting massive scalar fields on null infinity: a step towards an holographic description”*
- 10 Dec. 2005: 17th Workshop on Foundation and Constructive Aspects of QFT - Göttingen: *“Aspects of Holography in Asymptotically Flat Spacetimes and the BMS Group”*
- Sep.2005 Constr. Dyn. and Quant. Grav. Conference - Cala Gonone: *“The neverending quest of holography in asymptotically flat space-times”*

- 21 March 2005 Problemi Attuali di Fisica Teorica - Vietri sul Mare: “*The neverending quest of holography in asymptotically flat space-times*”
- Sep. 2004 XVI SIGRAV - Vietri Sul Mare: “*Aspects of Holography in Asymptotically Flat Spacetime and the BMS Group*”
- July 2004 GR17 - (Dublin): “*Holography in asymptotically flat space-times and the BMS group*”
- April 2004 Problemi Attuali di Fisica Teorica - Vietri Sul Mare: “*Holography in asymptotically flat space-times and the BMS group*”
- March 2004 319th Heraeus Seminar - Mathematical Relativity held in Bad-Honnef: “*Exploring the holographic principle in flat space-times via the BMS group*”
- Feb. 2003 Spinoza Institute - Utrecht: “*Modular properties of Random Regge Triangulations*”

### **Editorial board**

- Editor for *Advances in Mathematical Physics* – Hindawi
- Editor for *Geometric Flows* – De Gruyter - till 2020
- Review editor for *Frontiers in mathematical physics* - till 2016

### **Referee for international research projects**

- Referee for the Indian Institute of Technology
- Referee for the CONICYT projects - Comisión Nacional de Investigación Científica y Tecnológica (Chile)
- Referee for the PCE projects - Romanian Executive Agency for Higher Education, Research, Development and Innovation Funding
- Referee for the Cariplo projects - Cariplo Foundation
- Referee for the SIR projects - MIUR (Italian ministry for research and university)
- Referee for the DFG (German Research Foundation)

### **Referee and Reviewer - peer reviewed journals**

- Journal of Mathematical Analysis and Applications
- Annales scientifiques de l'École normale supérieure
- The European Physical Journal Plus
- Journal of Geometry and Physics
- Europhysics Letters
- Publications of the Research Institute for Mathematical Sciences
- Reports in Mathematical Physics
- JHEP
- Entropy
- International Journal of Geometric Methods in Modern Physics
- Proceedings of the Royal Society - Series A
- Journal of Differential Geometry
- Letters in mathematical physics
- Communications in mathematical physics
- Canadian Journal of Physics
- Frontiers in mathematical physics

- European Physical Journal C
- The Hadronic Journal
- Foundations of Physics
- Reviews in Mathematical Physics
- SIGMA
- Journal of Mathematical Physics
- Journal of Physics A
- Annales Henri Poincaré
- Physical Review Letters
- Physical Review D
- Classical and Quantum Gravity
- General Relativity and Gravitation
- Reviewer for Mathematical Reviews - American Mathematical Society – till 2015

### Ph.D. Students

- Beatrice Costeri - 10/2023 - 10/2026
- Alberto Bonicelli - 10/2021 - 10/2024
- Luca Sinibaldi - 10/2021 - 10/2024
- Federico Scavi - 10/2019 - 12/2022 *“Besov wavefront set and germs of distributions on smooth manifolds”*
- Lissa Campos - 10/2018 - 10/2021 - *“Probing thermal effects on static spacetimes with Unruh-DeWitt detectors”*
- Paolo Rinaldi - 10/2018 - 10/2021 - *“A Novel Perturbative Approach to Stochastic Partial Differential Equations”*
- Alessio Marta (cosupervisor at the University of Milan) - 10/2018 - 10/2021 – *“A Propagation of Singularities Theorem and a well-posedness Result for the Klein-Gordon Equation on Asymptotically Anti de Sitter Spacetimes with general Boundary Conditions”* (supervisor Prof. Livio Pizzocchero)
- Francesco Bussola - 10/2015 - 01/2019 - *“On the quantization of Bosonic free field theories on BTZ spacetime”*
- Simone Murro - 05/2014 - 04/2017 - *“Quantum States on the algebra of observables for Dirac fields”* – Co-supervisor at the University of Regensburg (supervisor: Prof. Felix Finster)
- Samuel Rutili - 10/2013 - 10/2017 - Project on *“Thermal states on curved backgrounds for interacting quantum field theories”* – withdrawn from the PhD programme.
- Gabriele Nosari - 10/2013 - 02/2017 - Project on *“On the algebraic approach to the dynamical Casimir effect”*
- Marco Benini - 10/2011 - 01/2015 - *“Locality in Abelian gauge theories over globally hyperbolic spacetimes”* (excellent)

## Laurea Thesis Supervisor and Co-supervisor

- December 2024 - Msc - Matteo Savasta – tba
- September 2024 - Msc - Stefano Rosarin – tba
- September 2024 - Bsc - Diego Dall’Ara – tba
- September 2024 - Bsc - Samuele Spedicato – tba
- September 2024 - Bsc - Alberto Ferrari – tba
- September 2024 - Bsc - Andrea Turelli – tba
- June 2024 - Msc - Michele Goi – tba
- May 2024 - IUSS Bsc - Daniel di Labio – tba
- May 2024 - IUSS Msc - Beatrice Costeri – “On the Spectral Asymmetry of the Dirac Operator on Three-dimensional, Closed, Riemannian Manifolds”
- December 2023 - Msc - Giovanni Bracchi – “The Asymptotic Behaviour of the Eigenvalues of the Operator curl” (full marks and honours)
- October 2023 - Msc - Filippo Nava – “Boundary effects and the Lorentzian Wetterich Equation” (full marks and honours)
- September 2023 - Msc - Beatrice Costeri – “A Microlocal Approach to the Study of the Nonlinear Stochastic Dirac Equation” (full marks and honours)
- September 2023 - Bsc - Andrea Maestri – “Onde di Shock per Sistemi di Leggi di Conservazione e la loro Applicazione al Flusso del Traffico” (full marks and honours)
- September 2023 - Bsc - Giovanni Molinari – “An ab initio derivation of the Cauchy stress tensor using tensor calculus techniques” (full marks and honours)
- September 2023 - Bsc - Carlo Andrea Rossi – “Algebraic Structures in Bose-Einstein Condensation” (full marks and honours)
- September 2023 - Bsc - Martina Onetti – “The superselection rule for the mass” (full marks and honours)
- September 2023 - Bsc - Tommaso Brambilla – “Logic of Physical Systems: An Algebraic Approach” (full marks and honours)
- September 2023 - Bsc - Pietro Falzoni – “The One-dimensional Moment Problem” (full marks and honours)
- September 2023 - Bsc - Raman Deep Singh – “Local Fundamental Solutions of the Wave Operator on Lorentzian Manifolds” (full marks and honours)
- June 2023 - Bsc - Giacomo Frigerio – “Stabilità dei punti di Lagrange nel problema a 3 corpi” 97/110
- April 2023 - MSc - Carmine Alfonso Ferrentino – “Quantum Abelian duality for Kalb-Ramond theory on globally hyperbolic spacetimes” (full marks and honours)
- March 2023 - BSc - Milo Repossi – “Non-collision singularities in the gravitational three-body scattering problem” (107/110)
- December 2022 - MSc - Gabriele Tartero – “The Anti-Hawking Effect on an Analogue BTZ Black Hole” (full marks and honours)
- September 2022 - BSc - Stefano Rosarin – “Algebraic Formulation of Quantum Theories” (full marks and honours)
- September 2022 - BSc - Bruno Minniti – “The Bose-Einstein Condensate: an Algebraic Perspective” (110/110)
- September 2022 - BSc - Angelo Portas Chiesa – “The Berry Phase and geometrical Phases” (full marks and honours)

- February 2022 - BSc - Giovanni Bracchi (University of Pavia) – “An introduction to microlocal analysis and the propagation of singularities” (109/110)
- February 2022 - BSc - Cristina Pezzi (University of Pavia) – “L’effetto Aharonov-Bohm” (106/110)
- February 2022 - MSc - Marco Mastronicola (University of Pavia) – “Backreaction of a scalar quantum field on a wormhole spacetime in semiclassical gravity” (full marks and honours)
- December 2021 - BSc - Michele Goi (University of Pavia) – “Simmetrie in Meccanica Quantistica” (110/110)
- December 2021 - MSc - Diego Salvi (University of Pavia) – “Algebraic Approach to Non-Linear  $\sigma$  Models at Second Order in Perturbation Theory” (110/110)
- October 2021 - MSc - Luca Sinibaldi (University of Pavia) – “Hawking Radiation for a Dirac Field as a Tunneling Process” (full marks and honours)
- October 2021 - MSc - Federico Comandulli (University of Pavia) – “The notion of observable in AQFT and the moment problem for  $*$ -algebras and GNS representations” (110/110)
- September 2021 - MSc - Alberto Bonicelli (University of Pavia) – “A microlocal approach to the stochastic nonlinear Schrödinger equation” (full marks and honours) – **awarded with the Grazioli Price 2021 at the Istituto Lombardo.**
- September 2021 - BSc - Paolo Besana (University of Pavia) – “Sistemi ed Equazioni Differenziali Caotici” (110/110)
- September 2021 - BSc - Beatrice Costeri (University of Pavia) – “Second Order Elliptic Partial Differential Equations and their Physical Applications” (full marks and honours)
- March 2021 - MSc - Denis Sina (University of Pavia) – “Ground States of a real Klein-Gordon Field with Robin Boundary Conditions in  $Lif_2$  spacetimes” (full marks and honours)
- February 2021 - MSc - Bruno Micciola (University of Parma) – “Stati di energia minima su spazio-tempo di Robertson-Walker” – (106/110, co-supervisor, supervisor: Prof. Luca Griguolo)
- November 2020 - BSc - Filippo Nava (University of Pavia) – “Costruzione della Misura Spettrale della Combinazione Lineare di due Osservabili Non Commutanti” (109/110)
- October 2020 - BSc - Filippo Capobianco (University of Pavia) – “Un’introduzione alla fluidodinamica e alla teoria degli strati limite” (full marks and honours)
- October 2020 - MSc - Giorgio Musante (University of Pavia) – “On the complex of observables for linearized gravity” (full marks and honours)
- October 2020 - MSc - Mattia Lacchini (University of Pavia) – “Edge modes and boundary conditions in gauge field theory” (full marks and honours)
- September 2020 - Iuss - Stefan-Nicolae Paicu (University of Pavia) – “Nonlinear Schrödinger equation and its applications” 100/100
- September 2020 - BSc - Gaia Andreani (University of Pavia) – “Limite termodinamico e transizioni di fase del primo ordine nei sistemi reticolari” (full marks and honours)
- September 2020 - BSc - Nicolás Nuca (University of Pavia) – “Processi di diffusione ed equazione di Fokker-Planck” 106/110
- July 2020 - BSc - Cecilia Fruet (University of Pavia) – “Mathematical Methods for Image Reconstruction: the Radon Transform” (full marks and honours)
- May 2020 - IUSS - Matteo Ferrari (University of Pavia) – “Calcolo Stocastico” (full marks)
- April 2020 - MSc - Alessandro Monteverdi (University of Pavia) – “On the renormalized stress energy tensor for a massless conformally coupled scalar field in BTZ” (109/110)
- September 2019 - BSc - Giovanni Bassi (University of Pavia) – “The logic of quantum mechanics” (100/110)

- September 2019 - BSc - Giovanni Mazzolari (University of Pavia) – “Mathematical formulation of Magnetohydrodynamics and its application to the solar wind” (full marks and honours)
- September 2019 - BSc - Matteo Ferrari – “Integrali di Feynman sui cammini e loro formalizzazione matematica” (full marks and honours)
- September 2019 - BSc - Federico Comandulli (University of Pavia) – “The formulation of Quantum Mechanics and the role of Gleason’s Theorem” (109/110)
- September 2019 - BSc - Alberto Bonicelli (University of Pavia) – “Geodesic motion on Riemannian manifolds from heat kernel techniques” (full marks and honours)
- September 2019 - BSc - Marco Mastronicola (University of Pavia) – “A rigorous introduction to ergodic theory” (108/110)
- September 2019 - MSc - Amodio Carleo (University of Pavia) – “Gravitational Wave Background from Cosmological Phase Transitions in a Gauge Extension of the Standard Model” with Pedro Schwaller – U. Mainz (full marks and honours)
- September 2019 - MSc - Rubens Longhi (University of Pavia) – “On the role of boundary conditions in the construction of fundamental solutions for Maxwell’s equations on spacetimes with timelike boundary” (full marks and honours) – **awarded with the Grazioli Price 2019 at the Istituto Lombardo.**
- May 2019 - IUSS - Paolo Rinaldi (University of Pavia) – “Diffusive Processes from an Algebraic Quantum Field Theory Viewpoint” (full marks)
- April 2019 - BSc - Giuseppe Auricchio (University of Pavia) – “Sistemi Hamiltoniani Vincolati e Teoria di Gauge” (108/110)
- October 2018 - MSc - Marcello Lanfranchi (University of Pavia) - “An operadic approach to AQFT” (full marks and honours)
- September 2018 - MSc - Riccardo Barbieri (University of Pavia) - “Residual Spin Misalignments in Gas-driven Inspirals of Supermassive Black-Hole Binaries” (full marks and honours)-
- September 2018 - MSc - Paolo Rinaldi (University of Pavia) - “Ricci Flow from Euclidean Renormalization Group Techniques” (full marks and honours) – cosupervisor (M. Carfora supervisor) – **awarded with the Grazioli Price 2018 at the Istituto Lombardo.**
- September 2018 - BSc - Giorgio Musante (University of Pavia) - “Un approccio algebrico alla condensazione di Bose-Einstein” (full marks and honours).
- July 2018 - BSc - Eugenio Mauri (University of Pavia) - - “Introduction to Quantum Backflow” (full marks and honours).
- April 2018 - IUSS - Alice Marveggio (University of Pavia) - “Balance Principles and Laws in Continuum Mechanics: a Geometric Approach” (full marks)
- April 2018 - IUSS - Giovanni Brigati (University of Pavia) - “Lie Groups and their Applications to Differential Equations” (full marks)
- April 2018 - MSc - Alessio Marta (University of Milan) - “Ground State for a Massive Scalar Field in AdS Spacetime with Robin Boundary Conditions” (110/110 e lode)
- February 2018 - BSc - Alessandro Monteverdi (University of Pavia) - “Stabilità ed Attrattori” (101/110)
- October 2017 - MSc - Luca Apadula (University of Pavia & Sissa) - “Quantum Reduced Loop Gravity” (full marks and honours)
- September 2017 - BSc - Alice Marveggio (University of Pavia) - “Wave Propagation for Systems of Conservation Laws and its Applications to Fluid Dynamics” (full marks and honours).
- July 2017 - BSc - Rubens Longhi (University of Pavia) - “On the fundamental solutions for wave-like equations on curved backgrounds” (full marks and honours).



- May 2017 - IUSS - Matteo Capoferri (University College London) - “A microlocal-analytic approach to the propagator of the wave operator” - (full marks and honours).
- December 2016 - MSc - Gioele Botta (University of Pavia & Sissa) - “New cosmological singularity resolution from quantum gravity: the Emergent-Bouncing universe” (full marks and honours).
- October 2016 - BSc - Angelo Naldi (University of Pavia) - “Introduzione alle equazioni di Eulero con applicazioni ai flussi potenziali” (104/110).
- September 2016 - BSc - Denny Trimcev (University of Pavia) - “Solitonic Solutions of NLS equation applied to Bose-Einstein Condensates” (110/110).
- September 2016 - IUSS - Paolo Rinaldi (University of Pavia) - “C\*- and von Neumann Algebras: Structural Aspects of the Observables of a Quantum System” (excellent)
- July 2016 - MSc - Giovanni Canepa (University of Pavia) - “An Ideal Characterization of Friedmann-Lemaître-Robertson-Walker Spacetimes” (full marks and honours)
- July 2016 - MSc - Matteo Capoferri (University of Pavia) - “Algebra Of Observables And States For Quantum Abelian Duality” (full marks and honours) – **awarded with the Grazioli Price 2016 at the Istituto Lombardo**
- July 2016 - BSc - Paolo Rinaldi (University of Pavia) - “Criteri per l’Identificazione di Osservabili in Meccanica Quantistica” (full marks and honours)
- November 2015 - MSc - Antonio Michele Miti (University of Milan) - “Algebraic Quantization of Jacobi Fields and Geometric Approach to Peierls Brackets” (110/110).
- October 2015 - BSc - Marcello Lanfranchi (University of Pavia) - “Formalizzazione algebrica del processo di quantizzazione e deformazione di C\*-algebra” (103/110).
- July 2015 - BSc - Gabriele Benomio (University of Pavia) - “Thermal equilibrium states in the algebraic formulation of quantum mechanics” (full marks and honours).
- December 2014 - MSc - Federico Faldino (University of Pavia) - “On the loop quantization of field theories” (full marks).
- October 2014 - IUSS - Giovanni Canepa (University of Pavia) - “Riesz potentials and construction of Green functions for wave-like equations” (excellent)
- October 2014 - IUSS - Matteo Capoferri (University of Pavia) - “The handling of singularities: an introduction to microlocal analysis” (excellent)
- October 2014 - IUSS - Sara Riccò (University of Pavia & of Geneva) - “B-modes and the CMB” (excellent)
- July 2014 - BSc - Matteo Capoferri (University of Pavia) - “On the time observable in non-relativistic quantum mechanics” (full marks and honours)
- July 2014 - BSc - Giancarlo Croce (University of Pavia) - “Operatori di Casimir” (full marks and honours).
- April 2014 - MSc - Alberto Melati (University of Pavia) - “Curvature fluctuations in asymptotically de Sitter spacetimes” (110/110).
- April 2014 - MSc - Sara Riccò (University of Pavia) - “States of low energy for the Dirac field on cosmological spacetimes” (full marks and honours).
- December 2013 - BSc - Matteo Facchini (University of Pavia) - “Gruppi di simmetria e regola di superselezione di Bargmann” (full marks and honours).
- October 2013 - MSc - Gabriele Nosari (University of Pavia) - “Point-splitting Hadamard regularization and the Casimir effect” (110/110)
- October 2013 - MSc - Simone Murro (University of Pavia) - “Hadamard states for linearized gravity in asymptotically flat spacetimes” (110/110).
- May 2013 - IUSS - Matteo Lostaglio (University of Pavia & Imperial College) - “Geometry and Physics: Gauge and Lorentz invariance” (outstanding)

- May 2013 - IUSS - Alessio Belenchia (University of Pavia & SISSA) - “Inflazione cosmologica: teoria ed osservazioni” (outstanding)
- February 2012 - BSc - Luca Mantovani (University of Pavia) “On the algebraic formulation of quantum mechanics” (104/110)
- December 2011 - BSc - Daniele Castellana (University of Pavia) “Relativity and Thermodynamics” (full marks)
- November 2011 - BSc - Davide Polini (University of Pavia) “On the dynamics of free field from the representations of the Poincaré group” (full marks and honours)
- October 2011 - MSc - Marco Benini (University of Pavia) “On the relative Cauchy evolution for spin 1 fields” (full marks and honours)
- May 2011 Daniel Siemssen (Universität Hamburg): “Hadamard states for the vector potential in asymptotically flat spacetimes” [http://www.desy.de/uni-th/theses/Dipl\\_Siemssen.pdf](http://www.desy.de/uni-th/theses/Dipl_Siemssen.pdf), co-supervisor
- July 2005 Simona Raschi: “Black holes spectroscopy” (full marks and honours), co-supervisor
- March 2004 Davide Cassani: “Topological field theories and the quantum Hall effect” (full marks and honours), co-supervisor
- March 2003 Giuditta Parolini: “Lie algebra and conformal field theories” (full marks and honours), co-supervisor

### Committees

- 16/03/2024 – Referee for the final dissertation of Angelos Anastopoulos (Univ. of Genoa – Ph.D. in mathematics)
- 2023 – Member of the evaluation committee for the admission to the PhD in physics (XXIX cycle).
- 31/07/2023 – Referee and member of the evaluation committee for the final dissertation of Daniele Volpe (Univ. of Trento - Ph.D. in mathematics)
- 27/06/2023 – Referee and member of the evaluation committee for the final dissertation of Yoshimura Kensuke Gallock (Univ. of Waterloo (Canada) - Ph.D. in physics)
- 10/01/2023 – Referee and member of the evaluation committee for the final dissertation of David Serrano Blanco (Univ. of York - Ph.D. in mathematics)
- 05/04/2022 – Referee for the final dissertation of Paolo Meda (Univ. of Genoa – Ph.D. in physics)
- 14/12/2021 – Referee and member of the evaluation committee for the final dissertation of Christiaan Jozef Farielda van de Ven (Univ. of Trento - Ph.D. in mathematics)
- 2021 – Member of the evaluation committee for the admission to the PhD in physics (XXXVII cycle).
- 20/03/2020 Referee and member of the evaluation committee for the final dissertation of Christian Röken (Univ. of Granada - Ph.D. in mathematics)
- 10/12/2019 Referee and member of the evaluation committee for the final dissertation of João Braga Vasconcellos (Univ. of Genoa - Ph.D. in mathematics)
- 15/02/2019 Referee and member of the evaluation committee for the final dissertation of Luca Curcuraci (Univ. of Trieste - Ph.D. in physics)
- 30/11/2018 Referee and member of the evaluation committee for the final dissertation of Massimo Gengo (Univ. of Milan - Ph.D. in mathematics)
- 06/04/2018 Referee and member of the evaluation committee for the final dissertation of Alberto Melati (Univ. of Trento - Ph.D. in physics)
- 24/04/2017 Referee and member of the evaluation committee for the final dissertation of Simone Murro (Univ. of Regensburg - Ph.D. in mathematics)

- 24/02/2016 Referee and member of the evaluation committee for the final dissertation of Antoine Géré (Univ. of Genova - Ph.D. in mathematics)
- 22/02/2016 Member of the evaluation committee for the final dissertation of Davide Fermi (Univ. of Milan - Ph.D. in mathematics)
- 13/11/2014 Member of the evaluation committee for the final dissertation of Davide Pastorello (Univ. of Trento - Ph.D. in mathematics)
- 2013-2016 Member of the Joint Committee of the Department of Physics - University of Pavia
- February 2013 Referee for the Ph.D. thesis of Zhirayr Avetisyan - Institute of Physics at the Univ. of Leipzig

### Teaching Experience

- Chair of “Mathematical Methods for Theoretical Physics” (6 credits), academic year 2022/2023
- Chair of “Mathematical Methods in Physics II” (6 credits), academic year 2022/2023
- Chair of “Physics” (3 credits) Bachelor Degree in Nursing, academic year 2022/2023
- Chair of “Mathematical Methods for Theoretical Physics” (6 credits), academic year 2021/2022
- Chair of “Mathematical Methods in Physics II” (6 credits), academic year 2021/2022
- MOOC “Precalculus” (12 hours in Italian & 12 hours in English), academic year 2021/2022, jointly with Prof. Marco Veneroni (Dept. of Math. – U. of Pavia)
- Chair of “Mathematical Methods for Theoretical Physics” (6 credits), academic year 2020/2021
- Chair of “Mathematical Methods in Physics II” (6 credits), academic year 2020/2021
- Introductory Course “Mathematics for Physicists” (12 hours), academic year 2020/2021
- Chair of “Advanced Topics in Quantum Field Theory”, academic year 2019/2020, graduate school in physics.
- Chair of “Mathematical Methods for Theoretical Physics” (3 credits), academic year 2019/2020
- Chair of “Group Theory and Physical Symmetries” (6 credits), academic year 2019/2020
- Chair of “Mathematical Methods in Physics II” (6 credits), academic year 2019/2020
- Mini-course on “Application of Variational Methods to Classical Field Theory” (May 2019 – Class of Science, Collegio Borromeo)
- Chair of “Mathematical methods of quantum theories”, graduate school in physics, academic year 2018/2019,
- Chair of “Group Theory and Physical Symmetries” (6 credits), academic year 2018/2019 (degree in physics and mathematics - Univ. Pavia)
- Chair of “Mathematical Methods in Physics II” (6 credits), academic year 2018/2019 (bachelor in physics - Univ. Pavia)
- Chair of “Mathematical Introduction to Fluid Dynamics”, academic year 2017/2018, graduate school in physics.
- Chair of “Group Theory and Physical Symmetries” (6 credits), academic year 2017/2018 (degree in physics and mathematics - Univ. Pavia)
- Chair of “Mathematical Methods in Physics II” (6 credits), academic year 2017/2018 (bachelor in physics - Univ. Pavia)
- Chair of “Group Theory and Physical Symmetries” (6 credits), academic year 2016/2017 (degree in physics and mathematics - Univ. Pavia)
- Chair of “Mathematical Introduction to Fluid Dynamics”, academic year 2016/2017 (IUSS Pavia - Class of Science)

- Chair of “Mathematical Methods in Physics II” (6 credits), academic year 2016/2017 (bachelor in physics - Univ. Pavia)
- Chair of “Mathematical methods of quantum theories”, graduate school in physics, academic year 2015/2016,
- Chair of “Group Theory and Physical Symmetries” (6 credits), academic year 2015/2016 (degree in physics and mathematics - Univ. Pavia)
- Assistant for “Classical Mechanics” (3 credits), academic year 2015/2016 (degree in physics - Univ. Pavia)
- Chair of “Group Theory and Physical Symmetries” (6 credits), academic year 2014/2015 (degree in physics and mathematics - Univ. Pavia)
- Assistant for “Classical Mechanics” (3 credits), academic year 2014/2015 (degree in physics - Univ. Pavia)
- Chair of “Spacetime Structure, Cosmology, and Quantum Field Theory”, academic year 2013/2014 (PhD programme in physics - Univ. Pavia)
- Chair of “Group Theory and Physical Symmetries”, academic year 2013/2014 (degree in physics and mathematics - Univ. Pavia)
- Assistant for “Classical Mechanics” (3 credits), academic year 2013/2014 (degree in physics - Univ. Pavia)
- Chair of “Group Theory and Physical Symmetries”, academic year 2012/2013 (degree in physics and mathematics - Univ. Pavia)
- Assistant for “Classical Mechanics”, academic year 2012/2013 (degree in physics - Univ. Pavia)
- Coordinator of the Ph.D. course “Spacetime structure, Cosmology, and Quantum Field Theory”, Ph.D. school in Physics, academic year 2012/2013,
- Chair of “Group Theory and Physical Symmetries”, academic year 2011/2012 (degree in physics and mathematics - Univ. Pavia)
- Assistant for “Classical Mechanics”, academic year 2011/2012 (degree in physics - Univ. Pavia)
- Assistant for “General Relativity”, academic year 2010/2011 (degree in physics and mathematics - Univ. Pavia)
- Assistant for “Quantum Mechanics 2”, academic year 2008/2009 (degree in physics and mathematics - Univ. Hamburg)
- Teaching assistant for “Differential Equations and Dynamical Systems”, academic year 2006/2007 (degree in physics and mathematics - Univ. Pavia)
- Teaching assistant for “Group Theory”, academic year 2006/2007 (degree in physics and mathematics - Univ. Piemonte Orientale)
- Seminars for “General Relativity”, academic year 2005/2006. (degree in physics and mathematics - Univ. Pavia)
- Teaching assistant for “Gruppi e Simmetrie Fisiche” (Group theory and Physical Symmetries), academic year 2005/2006. (degree in physics and mathematics - Univ. Pavia)
- Teaching assistant for “Meccanica Razionale” (Classical Mechanics), academic year 2004/2005. (degree in physics - Univ. Pavia),
- Teaching assistant for “Geometria” (Linear Algebra) academic year 2002/2003 (degree in physics and mathematics - Univ. Pavia),
- Tutor for the physics course - degree in “chemistry technician”. academic year 2000-2001,
- Tutor for Electromagnetism and Experimental Electromagnetism, academic year 1999-2000 and 2000-2001 (degree in physics - Univ. Pavia).

## Conference and Seminar Organization

- Member of the Organizing Committee of the Workshop “Common trends and challenges in QFT and stochastic PDEs” – Almo Collegio Borromeo, Pavia (10th-11th January 2024).
- Member of the Organizing Committee of the Workshop “Scattering, microlocal analysis and renormalization” – Mittag Leffler Institute in Stockholm (01th-05th June 2020) – online (25/05 – 18/06) due to Covid emergency.
- Member of the Organizing Committee of the INDAM Workshop “Algebraic Quantum Field Theory: Where Operator Algebras meets Microlocal Analysis” – Cortona, (04th-08th of June 2018),
- Organizer Committee of the miniworkshop “Quantum Mathematical Physics Day in Pavia”, Pavia 05th of July 2017,
- Member of the Organizing Committee of the topical Workshop “Foundational and structural aspects of gauge theories”, MITP - Mainz (27th of May – 02nd of June 2017),
- Member of the Organizing Committee of the topical Workshop “Microlocal Analysis: A Tool to Explore the Quantum World”, Department of Mathematics - Genoa (12-13 January 2017),
- Member of the Organizing Committee of the Workshop “Algebraic Quantum Field Theory: its status and its future”, Erwin Schrödinger Institute - Vienna (19th-23rd May 2014),
- Member of the Organizing Committee of the Mini-Workshop “New Crossroads between Mathematics and Field Theory”, Oberwolfach (21st-27th July 2013),
- Member of the Scientific Committee of the Conference “Mathematical Aspects of Quantum Field Theory and Quantum Statistical Mechanics”, Satellite Meeting of the ICMP2012, Hamburg (30th of July - 01st of August 2012),
- Member of the Scientific Committee of the Workshop “Planckland: Quantum Geometry and Matter”, Sissa-Trieste (13th-18th February 2012),
- Member of the Organizing Committee of the Workshop “Modern Trends in Algebraic Quantum Field Theory”, Pavia (14th-16th September 2011),
- Member of the Organizing Committee of the Workshop “Foundational Aspects of Cosmology”, Hamburg (16th-18th February 2011),
- Organizer of the Mathematical and Quantum Field Theory Seminars at the II. Institut für Theoretische Physik (Hamburg Universität) - 2008/2009,
- Member of the Organizing Committee of the 22nd LQP Workshop, Hamburg (06th-07th June 2008),
- Member of the Conference Secretariat for the Conference “Spacetime in action”, Pavia (29-03/02-04 2005).

## Outreach

- Lecture within the programme “Frontiere della Fisica” at the Almo Collegio Borromeo on the 15/12/2021
- Lecture *From Newton to Black Holes* given within the Stage for High School Students, organized by the Department of Physics - University of Pavia - July 2019 and September 2020, 2021, 2022 and 2023.
- F. Bussola and C. Dappiaggi, *Ligo e Le Onde Gravitazionali*, RADIAZIONI RICERCA E APPLICAZIONI, Periodico della Società Italiana per le Ricerche sulle Radiazioni, Vol XIX (2016).
- Several talks for high school classes, the Physics Stage at the Department of Physics of the University of Pavia in 2019 and at the  $\pi$ -day on General Relativity and Gravitational waves. I built and presented together with N. Protti (INFN - Pavia) a solar oven for the ERN 2016. I participated to the INFN Programme “Aggiornamenti” aimed to Middle School Teachers.

## Technical Skills

Computer Skills: Linux, L<sup>A</sup>T<sub>E</sub>X, Html.

Pavia, li 02/04/2024  
Claudio Dappiaggi