ELENCO DELLE PUBBLICAZIONI

COGNOME Cinelli

NOME Marco

01) Ortore, E., Circi, C., Ulivieri, C., Cinelli, M. (2014). Multi-sunsynchronous orbits in the solar system. Earth, Moon, and Planets, 111(3-4), 157-172.

02) Cinelli, M., Circi, C., Ortore, E. (2015). Polynomial equations for science orbits around Europa. Celestial Mechanics and Dynamical Astronomy, 122(3), 199-212.

03) Ortore, E., Circi, C., Cinelli, M. (2015). Optimal orbits around Ganymede for the JUICE mission. Aerospace Science and Technology, 46, 282-286.

04) Condoleo, E., Cinelli, M., Ortore, E., Circi, C. (2016). Frozen Orbits with Equatorial Perturbing Bodies: The Case of Ganymede, Callisto, and Titan. Journal of Guidance, Control, and Dynamics, 2264-2272.

05) Ortore, E., Cinelli, M., Circi, C. (2016). An analytical approach to retrieve the effects of a non-coplanar disturbing body. Celestial Mechanics and Dynamical Astronomy, 124(2), 163- 175.

06) Ortore, E., Cinelli, M., Circi, C. (2017). A ground track-based approach to design satellite constellations. Aerospace Science and Technology, 69, 458-464.

07) Condoleo, E., Cinelli, M., Ortore, E., Circi, C. (2017). Stable orbits for lunar landing assistance. Advances in Space Research, 60(7), 1404-1412.

08) Cinelli, M., Ortore, E., Circi, C. (2018). Long Lifetime Orbits for the Observation of Europa. Journal of Guidance, Control, and Dynamics, 42(1), 123-135.

09) Carbone, A., Cinelli, M., Circi, C., Ortore, E. (2020). Observing Mercury with a low propellant consumption. Celestial Mechanics and Dynamical Astronomy, 132(1), 8.

10) Cinelli, M., Ortore, E., Laneve, G., Circi, C. (2020).Geometrical approach for an optimal inter-satellite visibility. Astrodynamics.

11) Cinelli, M., Relazioni compatte per il progetto di costellazioni satellitari. Tesi di dottorato.

Elenco pubblicazioni: Alberto Fachechi

Il sottoscritto ALBERTO FACHECHI, unitamente alla domanda per la procedura pubblica di selezione per la copertura di n. 1 posto di Ricercatore a tempo determinato, Art. 24 c.3 lettera A) Legge 240/2010, presso il Dipartimento di Matematica e Fisica s.c. 01/A4 (Fisica Matematica) SSD MAT/07 (Fisica Matematica) con avviso pubblicato sulla G.U. n. 86 del 03/11/2020,

ALLEGA

la seguente lista di pubblicazioni valutabili dalla Commissione:

1. *A new mechanical approach to handle generalized Hopfield neural networks*
   Adriano Barra, Matteo Beccaria, Alberto Fachechi
   Neural Networks (Elsevier), Luglio 2018
   Reperibile al link: https://www.sciencedirect.com/science/article/abs/pii/S0893608018302090
   DOI: https://doi.org/10.1016/j.neunet.2018.07.010
   File: Pubblicazione 1.pdf

2. *Dreaming neural networks: forgetting spurious memories and reinforcing pure ones*
   Alberto Fachechi, Elena Agliari, Adriano Barra
   Neural Networks (Elsevier), Aprile 2019
   Reperibile al link: https://www.sciencedirect.com/science/article/abs/pii/S0893608019300176
   DOI: https://doi.org/10.1016/j.neunet.2019.01.006
   File: Pubblicazione 2.pdf

3. *Dreaming neural networks: rigorous results*
   Elena Agliari, Francesco Alemanno, Adriano Barra, Alberto Fachechi
   Journal of Statistical Mechanics: Theory and Experiment (IOP Science), Agosto 2019
   Reperibile al link: https://iopscience.iop.org/article/10.1088/1742-5468/ab371d/meta
   DOI: https://doi.org/10.1088/1742-5468/ab371d
   File: Pubblicazione 3.pdf

4. *On the Marchenko-Pastur law in analog bipartite spin-glasses*
   Elena Agliari, Francesco Alemanno, Adriano Barra, Alberto Fachechi
   Journal of Physics A: Mathematical and Theoretical (IOP Science), Maggio 2019
   Reperibile al link: https://iopscience.iop.org/article/10.1088/1751-8121/ab1934/meta
   DOI: https://doi.org/10.1088/1751-8121/ab1934
   File: Pubblicazione 4.pdf

5. *Neural networks with a redundant representation: detecting the undetectable*
   Elena Agliari, Francesco Alemanno, Adriano Barra, Martino Centonze, Alberto Fachechi
   Physical Review Letters (APS Science), Gennaio 2020
   Reperibile al link: https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.124.028301

DOI: https://doi.org/10.1103/PhysRevLett.124.028301
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6. *Interpolating between boolean and extremely high noisy patterns through minimal dense associative memories*
   Francesco Alemanno, Martino Centonze, Alberto Fachechi
   Journal of Physics A: Mathematical and Theoretical (IoP Science), Gennaio 2020
   Reperibile al link: https://iopscience.iop.org/article/10.1088/1751-8121/ab6943/meta
   DOI: https://doi.org/10.1088/1751-8121/ab6943
   File: Pubblicazione 6.pdf

7. *Detecting cardiac pathologies via machine learning on heart-rate variability time series and related markers*
   Elena Agliari, Adriano Barra, Orazio Antonio Barra, Alberto Fachechi, Lorenzo Franceschi Vento, Luciano Moretti
   Scientific Reports (Natura Publishing Group), Giugno 2020
   Reperibile al link: https://www.nature.com/articles/s41598-020-64083-4
   DOI: https://doi.org/10.1038/s41598-020-64083-4
   File: Pubblicazione 7.pdf

8. *Analysis of temporal correlation in heart rate variability through maximum entropy principle in a minimal pairwise glassy model*
   Elena Agliari, Francesco Alemanno, Adriano Barra, Orazio Antonio Barra, Alberto Fachechi, Lorenzo Franceschi Vento, Luciano Moretti
   Scientific Reports (Natura Publishing Group), Settembre 2020
   Reperibile al link: https://www.nature.com/articles/s41598-020-72183-4
   DOI: https://doi.org/10.1038/s41598-020-72183-4
   File: Pubblicazione 8.pdf

9. *Generalized Guerra's interpolation schemes for dense associative neural networks*
   Elena Agliari, Francesco Alemanno, Adriano Barra, Alberto Fachechi
   Neural Networks (Elsevier), Agosto 2020
   Reperibile al link: https://www.sciencedirect.com/science/article/abs/pii/S0893608020301714
   DOI: https://doi.org/10.1016/j.neunet.2020.05.009
   File: Pubblicazione 9.pdf

10. *An evolutionary game model for behavioral gambit of loyalists: global awareness and risk-aversion*
    Eleonora Alfinito, Adriano Barra, Matteo Beccaria, Alberto Fachechi, Guido Macorini
    Europhysics Letters (IOP Science), Marzo 2018
    Reperibile al link: https://iopscience.iop.org/article/10.1209/0295-5075/121/38001/meta
    DOI: https://doi.org/10.1209/0295-5075/121/38001

File: Pubblicazione 10.pdf

11. *Statistical Mechanics for Artificial Intelligence: Learning, Retrieving, Unlearning and Sleeping*
    Tesi di dottorato: Alberto Fachechi
    Supervisori: Prof. Adriano Barra, Prof.ssa Elena Agliari
    Discussa in data: 19/07/2019
    Reperibile al link: http://infn.it/thesis/thesis_dettaglio.php?tid=14230
    File: Pubblicazione 11 - tesi dottorato.pdf

DAVIDE FERMI

Publications List

1. D. Fermi, L. Pizzocchero,
Local Zeta Regularization and the Casimir Effect,
Prog. Theor. Phys. **126**(3) (2011), 419 – 434 [15 pages]. See also arXiv:1104.4330 [math-ph].
DOI:10.1143/PTP.126.419
URL: https://academic.oup.com/ptp/article/126/3/419/1855249
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2. D. Fermi, L. Pizzocchero,
Local zeta regularization and the scalar Casimir effect III. The case with a background harmonic potential,
Int. J. Mod. Phys. A **30**(35) (2015), 1550213 [42 pages]. See also arXiv:1505.01651 [math-ph].
DOI:10.1142/S0217751X15502139
URL: https://www.worldscientific.com/doi/abs/10.1142/S0217751X15502139
https://arxiv.org/abs/1505.01651

3. D. Fermi, L. Pizzocchero,
Local zeta regularization and the scalar Casimir effect IV. The case of a rectangular box,
Int. J. Mod. Phys. A **31**(04&05) (2016), 1650003 [56 pages]. See also arXiv:1505.03276 [math-ph].
DOI:10.1142/S0217751X16500032
URL: https://www.worldscientific.com/doi/abs/10.1142/S0217751X16500032
https://arxiv.org/abs/1505.03276

4. D. Fermi, L. Pizzocchero,
Local Casimir Effect for a Scalar Field in Presence of a Point Impurity,
Symmetry **2018**, **10**(2) (2018), 38 [20 pages]. (Invited contribution in I. H. Brevik, K. A. Milton (guest Eds.), Special Issue of Symmetry "Casimir Physics and Applications"). See also arXiv:1712.10039 [math-ph].
DOI:10.3390/sym10020038
URL: https://www.mdpi.com/2073-8994/10/2/38
https://arxiv.org/abs/1712.10039

5. D. Fermi, L. Pizzocchero,
A time machine for free fall into the past,
Class. Quant. Grav. **35**(16) (2018), 165003 [42 pages]. See also arXiv:1803.08214 [gr-qc].
DOI:10.1088/1361-6382/aace6e
URL: https://iopscience.iop.org/article/10.1088/1361-6382/aace6e
https://arxiv.org/abs/1803.08214v3

6. C. Cacciapuoti, D. Fermi, A. Posilicano,
On inverses of Krein's Q-functions,
Rend. Mat. Appl. (7) **39**(2) (2018), 229–240 [12 pages]. See also arXiv:1809.05150 [math.SP].
URL: https://www1.mat.uniroma1.it/ricerca/rendiconti/39_2_(2018)_229-240.html
https://arxiv.org/abs/1809.05150

7. C. Cacciapuoti, D. Fermi, A. Posilicano,
Scattering from local deformations of a semitransparent plane,
J. Math. Anal. Appl. **473**(1) (2019), 215-257 [43 pages]. See also arXiv:1807.07916 [math-ph].
DOI:10.1016/j.jmaa.2018.12.045
URL: https://www.sciencedirect.com/science/article/pii/S0022247X18310849
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Corrigendum,
J. Math. Anal. Appl. **482**(1) (2020), 123554 [2 pages].
DOI:10.1016/j.jmaa.2019.123554
URL: https://www.sciencedirect.com/science/article/pii/S0022247X19308224

8. D. Fermi, M. Gengo, L. Pizzocchero,
On the necessity of phantom fields for solving the horizon problem in scalar cosmologies,
Universe **2019**, 5(3) (2019), 76 [20 pages]. (Invited feature article). See also arXiv:1901.11511 [gr-qc].
DOI:10.3390/universe5030076
URL: https://www.mdpi.com/2218-1997/5/3/76
https://arxiv.org/abs/1901.11511

9. D. Fermi,
The Casimir energy anomaly for a point interaction,
Mod. Phys. Lett. A **35**(03) (2020), 2040008 [5 pages]. See also arXiv:1909.00604 [math-ph].
DOI:10.1142/S0217732320400088
URL: https://www.worldscientific.com/doi/pdf/10.1142/S0217732320400088
https://arxiv.org/abs/1909.00604

10. C. Cacciapuoti, D. Fermi, A. Posilicano,
The semi-classical limit with a delta potential,
Annali di Matematica Pura ed Applicata (2020), *online first* [37 pages]. See also arXiv:1907.05801 [math-ph].
DOI:10.1007/s10231-020-01002-4
URL: https://link.springer.com/article/10.1007%2Fs10231-020-01002-4
https://arxiv.org/abs/1907.05801v1

11. D. Fermi, M. Gengo, L. Pizzocchero,
Integrable scalar cosmologies with matter and curvature,
Nucl. Phys. B **957** (2020), 115095 [102 pages]. See also arXiv:2001.03228 [gr-qc].
DOI:10.1016/j.nuclphysb.2020.115095
URL: https://www.sciencedirect.com/science/article/pii/S0550321320301814
https://arxiv.org/abs/2001.03228

12. D. Fermi, L. Pizzocchero,
Local zeta regularization and the scalar Casimir effect. A general approach based on integral kernels,
World Scientific Publishing, Singapore (2017) [276 pages]. See also arXiv:1505.00711, arXiv:1505.01044 [math-ph].
ISBN: 978-981-3224-99-5 (hardcover); 978-981-3225-01-5 (ebook)
URL: https://www.worldscientific.com/worldscibooks/10.1142/10570,
https://arxiv.org/abs/1505.00711, https://arxiv.org/abs/1505.01044

13. D. Fermi,
A functional analytic framework for local zeta regularization and the scalar Casimir effect,
PhD Thesis, Corso di Dottorato in Matematica Ciclo XXVIII, Università degli Studi di Milano (2016).
Advisor: Prof. Livio Pizzocchero.

Milano, November 24, 2020

LIST OF PUBLICATIONS

ANNA FLORIO

- *A Conley-type Lyapunov function for the strong chain recurrent set.* Olga Bernardi, Anna Florio, Jim Wiseman. Preprint (2020).
- *Smooth conjugacy classes of 3D Axiom A flows and spectral rigidity of hyperbolic billiards.* Anna Florio, Martin Leguil. Preprint (2020).
- *Torsion of instability zones for conservative twist maps on the annulus.* Anna Florio, Patrice Le Calvez. To appear in *Nonlinearity* (2020).
- *On the set of points of zero torsion for negative-torsion maps of the annulus.* Anna Florio. Submitted (2020).
- *The generalized recurrent set, explosions and Lyapunov functions.* Olga Bernardi, Anna Florio, Jim Wiseman. To appear in *Journal of Dynamics and Differential Equations* (2019).
- *Torsion and Linking number for surface diffeomorphisms.* Anna Florio. *Mathematische Zeitschrift* Vol. 292, n.1-2, p. 231–265, (2019).
- *Existence of Lipschitz continuous Lyapunov function strict outside the strong chain recurrent set.* Olga Bernardi, Anna Florio. *Dynamical Systems: an International Journal* Vol. 34, n.1, p. 71–92, (2019).
- *A Conley-type decomposition of the strong chain recurrent set.* Olga Bernardi, Anna Florio. *Ergodic Theory and Dynamical Systems* Vol. 39, n.5, p.1261–1274, (2019).

Articles in preparation

- *Quantitative conditions for right handedness.* Anna Florio, Umberto L. Hryniewicz.
- *Existence of points of null asymptotic Maslov index on Lagrangian submanifolds hamiltonianly isotopic to the zero section.* Marie-Claude Arnaud, Anna Florio, Valentine Roos.
- *Emergence and Newhouse phenomena in Beltrami flows.* Pierre Berger, Anna Florio, Daniel Peralta-Salas.

Date: November 30, 2020.

LIST OF PUBLICATIONS

MATTEO GALLONE

December 2, 2020

1. Research Products

[1] M. Gallone, *Self-adjoint extensions of Dirac-Coulomb operator*, in Advances in Quantum Mechanics, G. Dell'Antonio and A. Michelangeli, eds., vol. 18 of INdAM-Springer series (2017), Springer International Publishing, pp. 169-185
https://doi.org/10.1007/978-3-319-58904-6_10

[2] M. Gallone, A. Michelangeli, *Self-adjoint realisations of the Dirac-Coulomb Hamiltonian for heavy nuclei*, in Analysis and Mathematical Physics (2018), https://doi.org/10.1007/s13324-018-0219-7

[3] M. Gallone, A. Michelangeli, *Discrete spectra for critical Dirac-Coulomb Hamiltonians*, in Journal of Mathematical Physics, Vol. 59, Issue 6 (2018), https://doi.org/10.1063/1.5011305

[4] M. Gallone, A. Michelangeli, E. Pozzoli, *On geometric quantum confinement in Grushin-type manifolds*, in Zeitschrift fr angewandte Mathematik und Physik (2019) 70:158, https://doi.org/10.1007/s00033-019-1203-2

[5] M. Gallone, A. Michelangeli, *Hydrogenoid spectra with central perturbations*, Reports on Mathematical Physics, Vol. 84, Issue 2 (2019) https://doi.org/10.1016/S0034-4877(19)30084-9

[6] M. Gallone, A. Michelangeli, A. Ottolini, *Kreĭn-Višik-Birman self-adjoint extension theory revisited*, in "Mathematical Challenges of Zero-Range Physics", INdAM-Springer series vol. 42, 219-304 (2020)

[7] M. Gallone, A. Michelangeli, *Self-Adjoint Extensions with Friedrichs lower bound*, Complex Anal. Oper. Theory 14, 73 (2020) 10.1007/s11785-020-01032-z

[8] *(submitted)* M. Gallone, S. Pasquali, *Metastability phenomena in two-dimensional rectangular lattices with nearest-neighbour interaction*, (2019), arXiv:1911.12648

[9] *(submitted)* M. Gallone, A. Ponno, B. Rink, *FPU and KdV: asymptotic integrability of quasi unidirectional waves*, (2020), arXiv:2010.03520

[10] *(submitted)* M. Gallone, A. Michelangeli, E. Pozzoli, *Geometric confinement and dynamical transmission of a quantum particle in Grushin cylinder*, (2020), arXiv:2003.07128

[11] *(preprint)* M. Gallone, A. Michelangeli, *Quantum particle across Grushin singularity*, arXiv:2011.13712

2. PhD Thesis

- *Self-adjointness of Quantum Hamiltonians with symmetry* - Ph.D. Thesis (Ph.D. in Geometry at Mathematical Physics at SISSA (Trieste) on 30/09/2019)

ELENCO DELLE PUBBLICAZIONI

Il sottoscritto Marco Alberto Javarone NATO a Omissis il Omissis presenta le seguenti n. 12 pubblicazioni scientifiche oltre la tesi di Dottorato in Matematica:

1. Articolo. A mean field approach to model levels of consciousness from EEG recordings. Marco A. Javarone et al., Journal of Statistical Mechanics: Theory and Experiment, 083405, 2020

2. Articolo. Heterogeneity in evolutionary games: an analysis of the risk perception, M.A. Amaral and Marco A. Javarone, Proceedings of the Royal Society A, 476(2237), 2020

3. Articolo. Heterogeneous update mechanisms in evolutionary games: mixing innovative and imitative dynamics. Marco A. Amaral and Marco A. Javarone. Physical Review E 97, 2018

4. Articolo. The Role of Noise in the Spatial Public Goods Game. Marco A. Javarone and Federico Battiston. Journal of Statistical Mechanics: Theory and Experiment P073404, 2016

5. Articolo. Statistical Physics of the Spatial Prisoner's Dilemma with Memory-aware Agents. Marco A. Javarone. European Physical Journal B (89:2) 2, 2016

6. Articolo. Conformity-driven agents support ordered phases in the spatial public goods game. Marco A. Javarone, Alberto Antonioni, Francesco Caravelli, EuroPhysics Letters (EPL - Europhysics Letters), 114(3), 38001, 2016

7. Articolo. Conformism-driven phases of opinion formation on heterogeneous networks: The q-voter model case. Marco A. Javarone and T. Squartini, Journal of Statistical Mechanics: Theory and Experiment, P10002, 2015

8. Articolo. Is Poker a Skill Game? New Insights from Statistical Physics. Marco A. Javarone. EuroPhysics Letters (EPL - Europhysics Letters), 110 – 58003, 2015

9. Articolo. Gaussian Networks Generated by Random Walks. Marco A. Javarone. Journal of Statistical Physics 159(108—119), 2015.

10. Articolo. Social Influences in Opinion Dynamics: the Role of Conformity. Marco A. Javarone. Physica A: Statistical Mechanics and Its Applications – volume 414, 2014

11. Articolo. Network Strategies in the Election Campaigns. Marco A. Javarone. Journal of Statistical Mechanics: Theory and Experiment – volume 2014 – P08013, 2014

12. Articolo. Perception of similarity: a model for social network dynamics
MA Javarone, G Armano, Journal of Physics A: Mathematical and Theoretical 46 (45), 455102, 2013

Tesi di Dottorato dal titolo: Statistical Physics of Evolutionary Game Theory and its Applications. Autore: Marco Alberto Javarone. Supervisori: Prof. S Mignemi, Prof. A. Barra. Università di Cagliari, 2017

Sassari, 02/12/2020

Pubblicazioni

Numero	Autori	Titolo	Casa Editrice	Volume	Anno
1	Stefano Marchesani	Hydrodynamic limit for a diffusive system with boundary conditions	ALEA	To Appear	2020
2	Stefano Marchesani, Stefano Olla	On the existence of L^2-valued thermodynamic entropy solutions for a hyperbolic system with boundary conditions	Communications in Partial Differential Equations	45	2020
3	Stefano Marchesani, Luca Alasio	Global existence for a class of viscous systems of conservation laws	Nonlinear Differential Equations and Applications	26	2019
4	Stefano Marchesani, Stefano Olla	Hydrodynamic limit for an anharmonic chain under boundary tension	Nonlinearity	31	2018

Tesi di Dottorato

5	Stefano Marchesani	Hydrodynamic limits under pressure	N/A	N/A	2017

Lista completa delle pubblicazioni di Vincenzo Morinelli

A) Pubblicazioni scientifiche:

1. R. Longo, V. Morinelli, K.-H. Rehren,
   Where Infinite Spin Particles Are Localizable,
   Commun. in Math. Phys., Volume 345, Issue 2, pp 587–614 (2016).
   https://doi.org/10.1007/s00220-015-2475-9.

2. V. Morinelli,
   An algebraic condition for the Bisognano-Wichmann Property,
   Proceedings of the 14th Marcel Grossmann Meeting - MG14, Rome pp. 3849-3854 (2017)
   https://doi.org/10.1142/9789813226609_0509.

3. V. Morinelli, Y. Tanimoto, M. Weiner,
   Conformal covariance and the split property
   Comm. Math. Phys. Volume 357, Issue 1, pp 379–406 (2018).
   https://doi.org/10.1007/s00220-017-2961-3.

4. V. Morinelli,
   The Bisognano-Wichmann property on nets of standard subspaces, some sufficient conditions,
   Ann. Henri Poincaré, Volume 19, Issue 3, 937–958 (2018).
   https://doi.org/10.1007/s00023-017-0636-4.

5. V. Morinelli, Y. Tanimoto,
   Scale and Möbius covariance in two-dimensional Haag-Kastler net,
   Commun. in Math. Phys. Vol 371, Issue 2, pp 619–650 (2019)
   https://doi.org/10.1007/s00220-019-03410-x

6. R. Longo, V. Morinelli, F. Preta, K.-H. Rehren,
   Split property for free finite helicity fields,
   Ann. Henri Poincaré, Volume 20, Issue 8, pp 2555-2258 (2019).
   https://doi.org/10.1007/s00023-019-00820-4

7. W. Dybalski, V. Morinelli,
   Bisognano-Wichmann property for asymptotically complete massless QFT,
   https://doi.org/10.1007/s00220-020-03755-8.
   Commun. in Math. Phys. 380, 1267–1294 (2020)

8. V. Morinelli, K.-H. Rehren,
   Spacelike deformations: Higher-helicity fields from scalar fields
   https://doi.org/10.1007/s11005-020-01294-w
   Lett. in Math. Phys. 110, 2019–2038 (2020)

B) Ph.D. Thesis:

1. V.Morinelli
   "On the Bisognano-Wichmann Property, Nuclearity and Particle Localization",
   Advisor: Prof. Roberto Longo, Dicembre 2015, Univ. Roma Tor Vergata.

C) Pubblicazioni sottomesse a riviste scientifiche sotto processo di peer review:

1. A. Stottmeister*, V. Morinelli, G. Morsella, Y. Tanimoto,
   Operator-algebraic renormalization and wavelets
   (sottomesso a rivista scientifica, sotto processo di peer-review)
   `https://arxiv.org/abs/arXiv:2002.01442` (2020)

2. V. Morinelli, G. Morsella, A. Stottmeister, Y. Tanimoto,
   Scaling limits of lattice quantum fields by wavelets,
   (sottomesso a rivista scientifica, sotto processo di peer-review).
   `https://arxiv.org/pdf/2010.11121.pdf` (2020)

3. V. Morinelli, and K.-H. Neeb,
   Covariant homogeneous nets of standard subspaces ,
   (sottomesso a rivista scientifica, sotto processo di peer-review)
   `https://arxiv.org/pdf/2010.07128.pdf` (2020)

   * = Corresponding author

Nota: I preprint sono allegati unitamente alle rispettive lettere di sottomissione alle riviste scientifiche, nella prima pagina del rispettivo pdf.

Rome, 01/12/2020 Vincenzo Morinelli

LIST OF PUBLICATIONS

Candidate: Marco Olivieri

- PhD thesis: “Quasi-classical dynamics of quantum particles interacting with radiation” (defended January 16^{th,} 2020). (PHD THESIS_OLIVIERI.pdf)

- M. Correggi, M. Falconi, M. Olivieri, *Ground State Properties in the Quasi-Classical Regime*, preprint arXiv:2007.09442 (2020). (GROUND STATE_OLIVIERI.pdf).

- M. Correggi, M. Falconi, M. Olivieri, *Quasi-Classical Dynamics*, preprint arXiv:1909.13313 (2019). (DYNAMICS_OLIVIERI.pdf).

- R. Carlone, M. Correggi, M. Falconi, M. Olivieri, *Microscopic Derivation of Time-dependent Point Interactions*, preprint arXiv:1904.11012 (2019). (MICROSCOPIC_OLIVIERI.pdf).

- M. Correggi, M. Falconi, M. Olivieri, *Magnetic Schrödinger operators as the quasi-classical limit of Pauli–Fierz-type models*, J. Spectr. Theory 9, 1287-1325 (2019). (MAGNETIC_OLIVIERI.pdf).

- D. Finco, M. Olivieri, *On the inverse spectral problems for quantum graphs*, in Advances in Quantum Mechanics: Contemporary Trends and Open Problems, A. Michelangeli, G. Dell’Antonio edts., 267-281 (2017). (QUANTUM GRAPHS_OLIVIERI.pdf).

Nahuel Soprano Loto's publications

Published articles

1. **Generalized max-weight policies in stochastic matching**
   With M. Jonckheere, P. Moyal and C. Ramírez
   arXiv:2011.04535
   Submitted to Queueing Systems: Theory and Applications (QUESTA)

2. **Rank Dependent Branching-Selection Particle Systems**
   With P. Groisman
   arXiv:2008.09460
   Submitted to The Electronic Journal of Probability (EJP)

3. **Non local branching Brownians with annihilation and free boundary problems**
   With A. De Masi, P. A. Ferrari and E. Presutti
   Electron. J. Probab., Volume 24 (2019), paper no. 63, 30 pp.

4. **Turing instability in a model with two interacting Ising lines: linear stability and non-equilibrium fluctuations**
   With M. Capanna
   J Stat Phys (2019) 174: 365. https://doi.org/10.1007/s10955-018-2206-7

5. **Turing instability in a model with two interacting Ising lines: hydrodynamic limit**
   With M. Capanna
   Markov Proc. Rel. Fields, 23(3):401-420, 2017

6. **Large deviations for spatially inhomogeneous magnetization and Young-Gibbs measures**
   With A. Montino and D. Tsagkarogiannis
   J. Stat. Phys. (2016) 164: 1318

7. **Phase transition for the dilute clock model**
   With I. Armendáriz and P. A. Ferrari
   Stochastic Process. Appl., 125(10):3879-3892, 2015
   arXiv:1404.4071

PhD thesis

Transición de fase para modelos diluidos y grandes desvíos para magnetizaciones no homogéneas
`http://cms.dm.uba.ar/academico/carreras/doctorado/tesis_sopranoloto.pdf`
Universidad de Buenos Aires

Book chapters

Hydrodynamics of the N-BBM process
With A. De Masi, P. A. Ferrari and E. Presutti
Chapter of the book Stochastic Dynamics out of Equilibrium, Springer Proceedings in Mathematics & Statistics series, Volume 282, ISBN 978-3-030-15095-2

ALESSIO TROIANI – ELENCO PUBBLICAZIONI

1. F. den Hollander, F. R. Nardi, A.Troiani; Metastability for Kawasaki dynamics with two types of particles: stable/metastable configurations and communication heights, *Journal of Statistical Physics*, 145, 1423–1457, 2011, https://doi.org/10.1007/s10955-011-0370-0
2. F. den Hollander, F. R. Nardi, A.Troiani; Metastability for Kawasaki dynamics at low temperature with two types of particles, *Electronic Journal of Probability*, 17(2), 1–26, 2012, doi:10.1214/EJP.v17-1693
3. F. den Hollander, F. R. Nardi, A.Troiani; Metastability for Kawasaki dynamics with two types of particles: critical droplets, *Journal of Statistical Physics*, 149, 1013–1057, 2012, https://doi.org/10.1007/s10955-012-0637-0
4. A. Troiani; Metastability for Kawasaki dynamics with two types of particles, PhD Thesis, 2012, ISBN 9789461914644, handle: http://hdl.handle.net/1887/20065
5. O. Costin, J. L. Lebowitz, E. R. Speer, A. Troiani; The blockage problem, *Bulletin of the Institute of Mathematics Academia Sinica (New Series)*, 8(1), 49–72, 2013, ISSN: 2304-7895 [online]
6. B. Scoppola, A. Troiani; Gaussian Mean Fields Lattice gas, *Journal of Statistical Physics* (2018), 170:1161, https://doi.org/10.1007/s10955-018-1984-2
7. V. Apollonio, R. D'Autilia, B. Scoppola, E. Scoppola, A. Troiani; Criticality of measures on 2-d Ising configurations: from square to hexagonal graphs, *Journal of Statistical Physics*, 2019, https://doi.org/10.1007/s10955-012-0637-0

Palestrina, 2 dicembre 2020 ALESSIO TROIANI

Publications presented for evaluation

December 2, 2020

1. F. Ares and J. Viti, *Emptiness formation probability and Painlevé V equation in the XY spin chain*, J. Stat. Mech. 1 013105 (2020).

2. G. Gori and J. Viti, *Four-point boundary connectivities in critical two-dimensional percolation from conformal invariance*, JHEP 12 131 (2018).

3. I. Lyberg, V. Korepin, G. A. P. Ribeiro and J. Viti, *Phase separation in the six-vertex model with a variety of boundary conditions*, Journal of Mathematical Physics 59, 053301 (2018) [Invited contribution to Journal of Mathematical Physics special issue "To the memory of Ludwig Faddeev".]

4. M. Collura, A. De Luca and J. Viti, *Analytic solution of the domain wall initial state*, Phys. Rev. B 97, 081111 (2018).

5. G. Gori and J. Viti, *Exact logarithmic four-point functions in the critical Ising model*, Phys. Rev. Lett. 119, 191601 (2017).

6. J. Dubail, J-M. Stéphan, J. Viti and P. Calabrese, *Conformal Field Theory for Inhomogeneous One-dimensional Quantum Systems: the Example of Non-Interacting Fermi Gases*, Sci. Post 002 (2017).

7. J. Viti, J-M. Stéphan, J. Dubail and M. Haque, *Inhomogeneous quenches in a fermionic chain: exact results*, EPL 115 (2016) 40011

8. N. Allegra, J. Dubail, J.M. Stephan and J. Viti, *Inhomogeneous field theory inside the arctic circle* , J. Stat. Mech. (2016) 053108.

9. D. Bernard, B. Doyon and J. Viti, *Non-Equilibrium Conformal Field Theory with Impurities*, J. Phys. A 48 (2015) 05FT01 [Highlights 2015].

10. A. De Luca, J. Viti, D. Bernard and B. Doyon, *Non-equilibrium thermal transport in the quantum Ising chain*, Phys. Rev. B 88 134301 (2013).

11. G. Delfino and J. Viti, *On three-point connectivity in two-dimensional percolation*, J.Phys. A: Math. Theor.44: 032001, (2011).

12. G. Delfino, J. Viti and J. Cardy, *Universal amplitude ratios of two-dimensional percolation from field theory*, J. Phys. A: Math. Theor.43: 152001, (2010) [Highlights 2010].

13. J. Viti, *Universal properties of two dimensional percolation*, Ph.D thesis, SISSA, Trieste (2012).

Curriculum Vitae

(senza dati personali)

Marco Cinelli

23 Novembre 2020

Indice

1 Istruzione

- **24 Gennaio 2013:** Laurea Magistrale in Ingegneria Astronautica (LM20) - Università La Sapienza, Roma. Titolo della tesi: "Orbite di interesse scientifico per lo studio di satelliti naturali". Relatore Prof. C. Ulivieri. Votazione 105/110.

- **22 Febbraio 2017:** Dottorato di ricerca in Energia e Ambiente, indirizzo Habitat Spaziale e Telerilevamento - Dipartimento di Ingegneria Astronautica, Elettrica ed Energetica dell'Università La Sapienza di Roma. Titolo della tesi: "Relazioni compatte per il progetto di costellazioni di satelliti". Relatori Prof. F. Gugliermetti e Prof. C. Circi.

- **30 Aprile 2019:** Master di II livello in Scienza e Tecnologia Spaziale - Dipartimento di Matematica dell'Università di Roma Tor Vergata. Titolo della tesi: "Mitigazione del rischio di collisione dell'asteroide 2011 AG5 mediante impattatore cinetico". Relatore G. B. Valsecchi. Votazione: 110/110 con lode.

2 Altre Esperienze Formative

- **3-7 Febbraio 2020**: Partecipazione alla I-CELMECH Training School presso il dipartimento di matematica "Federigo Enriques" dell'Università degli studi di Milano.

- **19-22 Marzo 2019**: Workshop "Mathematical Models and Methods in Earth and Space Sciences" presso il dipartimento di matematica dell'Università di Roma Tor Vergata.

- **12-14 Ottobre 2015**: Partecipazione alla conferenza "Earth Observation Science 2.0" presso la sede ESA-ESRIN di Frascati.

3 Esperienze Lavorative

- **1 Agosto 2019 - in corso**: Assegnista Post-doc per INdAM - Istituto Nazionale di Alta Matematica con sede operativa presso il Dipartimento di Matematica dell'Università di Roma Tor Vergata, Via della Ricerca Scientifica, 1, 00133 Roma.

Partecipazione alle attività del team di progetto di missione per la costellazione HERMES Technology Pathfinder dell'Agenzia Spaziale Italiana in solido con il team del Politecnico di Milano guidato dalla Prof.ssa Michèle Lavagna.
Attività di ricerca su tematiche della meccanica celeste.
Supervisori: Prof.ssa Alessandra Celletti e Prof. Giuseppe Pucacco.

- **16 Luglio 2018 - 15 Gennaio 2019**: Tirocinio formativo presso ASI - Agenzia Spaziale Italiana; Via del Politecnico, 00133 Roma.
  Collaborazione alle attività di disegno di missione della missione HERMES-Technology Pathfinder, con particolare riferimento ai sottosistemi TMTC e GNC.
  Supervisore: Dott.ssa Simonetta Puccetti.

- **Febbraio 2017 -**: Collaborazione volontaria nelle attività del Laboratorio di Missioni Spaziali del Dipartimento di Astronautica dell'Università La Sapienza di Roma; Via Salaria, 851, 00185 Roma.
  Sviluppo di un software per il disegno di costellazioni e mega-costellazioni (`http://www.gmspazio.com/portfolio-view/gcod/`) all'interno di una partnership tra Ateneo e GMSPAZIO srl.
  Ricerche nell'ambito dell'astrodinamica e del disegno di missioni per l'osservazione della Terra e dei principali corpi del Sistema Solare.
  Supervisore: Prof. Christian Circi.

- **13 Maggio 2013 - 13 Agosto 2013:** Contratto di collaborazione (Co.Co.Co) trimestrale presso il Dipartimento di Astronautica (DIAEE) dell'Università La Sapienza; Via Salaria, 851, 00185 Roma.
  Contratto di collaborazione finalizzato all'individuazione di orbite di interesse scientifico per l'osservazione planetaria, con particolare riferimento alle orbita eliosincrone e multi-sincrone con il Sole.
  Supervisore: Prof. Carlo Ulivieri.

4 Ricerca

4.1 Pubblicazioni

I) Ortore, E., Circi, C., Ulivieri, C., Cinelli, M. (2014). Multi-sunsynchronous orbits in the solar system. Earth, Moon, and Planets, 111(3-4), 157-172.

II) Cinelli, M., Circi, C., Ortore, E. (2015). Polynomial equations for science orbits around Europa. Celestial Mechanics and Dynamical Astronomy, 122(3), 199-212.

III) Ortore, E., Circi, C., Cinelli, M. (2015). Optimal orbits around Ganymede for the JUICE mission. Aerospace Science and Technology, 46, 282-286.

IV) Condoleo, E., Cinelli, M., Ortore, E., Circi, C. (2016). Frozen Orbits with Equatorial Perturbing Bodies: The Case of Ganymede, Callisto, and Titan. Journal of Guidance, Control, and Dynamics, 2264-2272.

V) Ortore, E., Cinelli, M., Circi, C. (2016). An analytical approach to retrieve the effects of a non-coplanar disturbing body. Celestial Mechanics and Dynamical Astronomy, 124(2), 163- 175.

VI) Ortore, E., Cinelli, M., Circi, C. (2017). A ground track-based approach to design satellite constellations. Aerospace Science and Technology, 69, 458-464.

VII) Condoleo, E., Cinelli, M., Ortore, E., Circi, C. (2017). Stable orbits for lunar landing assistance. Advances in Space Research, 60(7), 1404-1412.

VIII) Cinelli, M., Ortore, E., Circi, C. (2018). Long Lifetime Orbits for the Observation of Europa. Journal of Guidance, Control, and Dynamics, 42(1), 123-135.

IX) Carbone, A., Cinelli, M., Circi, C., Ortore, E. (2020). Observing Mercury with a low propellant consumption. Celestial Mechanics and Dynamical Astronomy, 132(1), 8.

X) Cinelli, M., Ortore, E. Laneve, G., Circi, C. (2020). Geometrical approach for an optimal inter-satellite visibility (Accettato in data 21/11 dalla rivista Astrodynamics).

XI) Cinelli, M., Pucacco, G., Puccetti, S., Lavagna, M. (2020). HERMES preliminary full constellation design.(In attesa di sottomissione).

XII) Celletti, A., Cinelli, M., Pucacco, G. (2020). Normal form for the dynamics around the collinear points of the elliptic restricted three-body problem.(In preparazione).

4.2 Indicatori Bibliometrici

In Tabella 1 sono riportati gli indicatori bibliometrici al 23/11/2020. I miei codici identificativi sono:

- Web of Science ResearcherID: AAG-7073-2020;
- ORCID: 0000-0001-8713-3591;
- Scopus Author ID: 56090945100;

Sito	Documenti	Citazioni	H-index
Scopus:	9	38	4
Web of Science:	9	34	4
Scholar Google:	9	43	4

Tabella 1: Indicatori Bibliometrici

5 Didattica

- **A.A. 2015-16 e 2016-17**: Lezioni in forma seminariale sull'uso del software STK all'interno del corso in Traiettorie Interplanetarie del Prof. C. Circi - Università La Sapienza di Roma, corso di LM Ingegneria Spaziale e Astronautica.
- **A.A. 2019-20**: Due lezioni da due ore in forma seminariale all'interno del corso in Meccanica Analitica e Celeste della Prof.ssa Alessandra Celletti - Università di Roma Tor Vergata, corso di LM in Matematica.
- **A.A. 2019-20**: Corso in "Costellazioni di satelliti nel geo-potenziale terrestre" (4 ore, Prot. n. 0000114 del 20/01/2020) nell'ambito del modulo Meccanica Celeste del Master di II Livello in Scienza e Tecnologia Spaziale dell'Università di Roma Tor Vergata.
- **A.A. 2019-20**: Partecipazione alla didattica e agli esami per il corso di Laboratorio di Calcolo 2 della Prof.ssa Alessandra Celletti (4 CFU) - Università di Roma Tor Vergata, corso di Laurea in Matematica.

6 Riconoscimenti e Premi

- Partecipa al team del progetto premiale FOE (MIUR) H.E.R.M.E.S. Pathfinder: High Energy Rapid Modular Ensemble of Satellites: uno sciame di satelliti per sondare la struttura dello Spazio-Tempo per conto dell'INdAM.
- Membro del GNFM - Gruppo Nazionale per la Fisica Matematica, Meccanica dei sistemi discreti.
- Socio ordinario della SIMCA (Società Italiana di Meccanica Celeste e Astrodinamica).
- Cultore della Materia LC2 (Laboratorio di Calcolo 2) presso l'Università di Roma Tor Vergata (AA 2019/20).
- Revisore per le riviste internazionali: "Advances in Space Research", "Journal of Guidance, Control, and Dynamics" e "IEEE Access". Revisioni verificate: `https://publons.com/researcher/3446544/marco-cinelli/peer-review/`.
- Vincitore di una borsa di studio a copertura integrale per il Master di II Livello in Scienza e Tecnologia Spaziale dell'Università di Roma Tor Vergata.

Curriculum Vitae

Last update November 21, 2020

Personal information

Name / Surname **Fachechi, Alberto**

Qualification PhD in Theoretical Physics (defended the thesis on July 19th, 2019)
Department of Mathematics and Physics "E. De Giorgi", Unisalento (Lecce, Italy)

Actual position Post-doc researcher
Actual insitution Department of Mathematics and Physics ”E. De Giorgi”, Unisalento
INFN (Istituto Nazionale di Fisica Nucleare), Lecce section
GNFM-INdAM (Gruppo Nazionale per la Fisica Matematica), Lecce section

Previous position Junior fellowship researcher
Previous insitution Department of Mathematics and Physics ”E. De Giorgi”, Unisalento
INFN (Istituto Nazionale di Fisica Nucleare), Lecce section
GNFM-INdAM (Gruppo Nazionale per la Fisica Matematica), Lecce section

Keywords Neural Networks, Machine Learning, Deep Learning, Theoretical Physics, Statistical Physics, Mathematical Physics

Contents

Main interests

Research and personal interests

My main interests lie in the wide discipline of stochastic systems physics and statistical methods to model them. More precisely, my activity is based on the investigation of dynamics in complex (in particular, neural) networks and their collective phenomena and emergent properties, with a strong interest in the development of rigorous mathematical techniques for dealing with these problems. I am also very interested in their applicative consequnces, for example machine (deep) learning and related topics, in particular intheir medical and biological applications.

Previous interests

I also dealt with specific problems in supersymmetric quantum field theories, conformal field theories and string theory, in particular concerning their features on the point of view of integrability.

Highlights

Contributions

For a complete list of publications, see here.

Metrics

Total number of papers: 21.
Total number of published papers: 18.
Total number of citations (GoogleScholar): 116.
Average number of citations per paper: 6.0.
Total number of published papers within last solar year (2019): 3.
Number of citations within last solar year (2019): 21.
h-index (GoogleScholar): 6.
i10-index (GoogleScholar): 3.
ResearchGate score: 22.78.
ResearchGate recommendations: 27.
ResearchGate total interest: 111.3.
Total reads in ResearchGate: 2015.

For a complete list of talks, see here.

Collaborations, communities and partecipations

During my activity, I collaborated with many academic researchers and professors. I also took part in national and international research communities supporting my research travels and particaptions to schools and international conferences. See next pages for more details.

Teaching and supervising

During my activity, I covered teaching roles in technical courses concerning mathematics, physics, complex systems and statistical mechanics for neural networks and mathematical methods. See next pages for details.

External projects

During my activity, I also gave technical advices in the context of statistical inference and big data analysis. See next pages for details.

Positions

Dates	March 2020 - March 2021
Description	**Junior research fellowship**
Scientific sector	MAT/07
Subjects	Realization of Machine Learning models and algorithms (in particular, Deep Learning), both focusing on the analytical and numerical point of views, and with particular interest to biological and medical application (i.e. cancer diagnostic).
Reference	Prof. Adriano Barra
Additional informations	First place in the final ranking list (final mark 60/60)
Institution	Università del Salento

Dates	February 2019 - February 2020
Description	**Junior research fellowship**
Scientific sector	MAT/07
Subjects	Realization of Machine Learning models and algorithms (in particular, Deep Learning), both focusing on the analytical and numerical point of views, with particular interest in their application to biological data analysis (e.g. analysis of peculiarities in heart-rate variability and related pathologies).
Denomination	POR CALABRIA FESR/FSE 2014/2020, “Rete Match: Progetto Pythagoras” project (ref. Dr. Adriano Barra)
Additional informations	First place in the final ranking list (final mark 60/60)
Institution	Università del Salento

Dates	January 2016 - January 2019
Description	**PhD student**
Subjects	Statistical mechanics for Artificial Intelligence
Additional informations	Second place in the final ranking list (final mark 81/100)
Scholarship	Yes
Institution	Università del Salento

Technical skills and competences

Basics

Great knowledge of many basic and advanced mathematical topics (such as real and complex analysis, linear and non-linear integrable systems), fundamental algebra and geometry (also regarding group theory and differential geometry).

Deep knowledge of physical phenomena and mathematical methods for dealing them and great ability in modelling problem in mathematical language.

Soft skills

Great ability in team working and social learning.

Technologies

Good knowledge of web-based programming language HTML.

Good knowledge of C programming language.

Good knowledge of object-oriented programming, in particular C++.

Advanced knowledge of Python (favorite) programming language, especially concerning (big) data analysis and neural networks design, and related libraries (in particular, *numpy* and *scipy*).

Advanced knowledge of Bash scripting language.

Good knowledge of deep learning frameworks, in particular *TensorFlow* and *Keras*.

Good knowledge of Julia programming language, in particular concerning scientific data analysis.

Operating Systems

Great ability in using Microsoft Windows (from XP version up to Windows 10) and GNU/Linux (most used) operating systems.

Basic knowledge of MacOS operating systems.

Environment

Great ability in using office suites, in particular Microsoft Office and OpenOffice (now LibreOffice).

Good knowledge of Wolfram Mathematica environment and programming.

Basic knowledge of MatLab environment.

Good knowledge of Jupyter, Jupyter-lab, Atom and Spyder IDEs.

Other

Advanced knowledge of LaTeX language.

Basic knowledge of cyber-security (as certified by the basic Cyber-Security course of INFN)

Personal skills

Mother tongue

Italian

Other language(s)

English

Self-assessment
European level(*)

Understanding		Speaking		Writing
Listening	Reading	Spoken interaction	Spoken production	
Excellent	Excellent	Excellent	Excellent	Excellent

English

Driving License

Yes

Education and training

Dates	2015 - 2019
Title of qualification	PhD in **Theoretical Physics**
Main subjects of research	AdS/CFT and AGT correspondances, supersymmetric models and their integrability features. Statistical models of complex networks dynamics and applications in epidemic diffusion processes.
Main subjects of curricular study	Differential geometry with applications to physical problems; object-oriented programming; non-linear physics and classical integrable systems.
Thesis	I presented my thesis entitled "Statistical Mechanics for Artificial Intelligence: Learning, Retrieving, Unlearning and Sleeping", supervisors Dr. Adriano Barra (Università del Salento) and Dr. Elena Agliari (Università La Sapienza). In the thesis, associative neural networks capabilities are analyzed by means of mathematical models borrowed for Statistical Mechanics of Complex Systems. In particular, a dreaming Hopfield neural networks is proposed and studied. This model shows enhanced retrieval performances, in particular a maximal critical storage capacity and the disappearing of the spin-glass phase in the infinite sleeping time limit. We also considered an extension of Hopfield network to a P-spin model (based on a simple mechanical analogy) showing better retrieval performances with respect to the pairwise setup. I defended my PhD thesis on 19th July 2019.
Organization	Università del Salento
Level in national or international classification	Excellent

Dates	2013 - 2015
Title of qualification	MS in **Theoretical and Fundamental Interactions Physics**
Main subjects	Basic notions in structure of matter, nuclear physics, particle physics and astrophysics. Advanced insights in theoretical physics, in particular in non-relativistic quantum mechanics, quantum field theory, general relativity, physics of non-linear systems and theoretical particle physics. Advanced insights in mathematical methods for theoretical physics.
Thesis	I presented my thesis entitled “Higher spin Lifshitz theories and integrable systems”, supervisor Prof. Matteo Beccaria (Università del Salento). In this work, I show the connection between Einstein-Hilbert gravity in $2+1$ dimensions with a negative cosmological constant and the Chern-Simons theory with gauge group $SL(2,\mathbb{R}) \times SL(2,\mathbb{R})$. Morevore, I present some recent results on the relation of CS Lifshitz theories with $\mathfrak{sl}(N,\mathbb{R}) \oplus \mathfrak{sl}(N,\mathbb{R})$ gauge algebra and the Korteweg-de Vries integrable hierarchy.
Organization	Università del Salento
Level in national or international classification	110/110 with honors

Dates	2009-2013
Title of qualification	BS in **Physics**
Main subjects	Basic notions in classical mechanics (Newtonian, Lagrangian and Hamiltonian mechanics), thermodynamics and statistical physics, physics of electromagnetic phenomena and non-relativistic quantum mechanics.

Thesis	I presented my thesis entitled “Integrabilty in AdS/CFT”, supervisor Prof. Matteo Beccaria (Università del Salento). In this work, I studied an aspect of type IIB $AdS_5 \times S^5$ superstring dual theory (which is the $\mathcal{N} = 4$ Super Yang-Mills gauge theory) which allows to compute the anomalous dimension of a family of operators (related to energetic eigenvalues of string states) by using properties of integrability.
Organization	Università del Salento
Level in national or international classification	110/110
Dates	2009
Title of qualification	Scientific High School Diploma
Organization	Liceo Scientifico e Linguistico Antonio Vallone, Galatina (LE) - Italy
Level in national or international classification	100/100

Communities

Dates	2016 - 2017
Project	**GATIS** - INFN, Bologna section
Description	GATIS (GAuge Theory as an Integrable System) is the European-wide Initial Training Network in High Energy Physics and Mathematics. Research on the GATIS topics is performed in many institutions around the world.
Dates	2015 - 2019
Institution	**INFN**, Lecce section
Description	Associate to INFN (Istituto Nazionale di Fisica Nucleare).
Dates	2018 - Today
Institution	**GNFM-INdAM**
Description	Associate to GNFM-INdAM (Gruppo Nazionale per la Fisica Matematica).

Collaborations

Dates	2015 - 2018
Collaborator	Prof. **Matteo Beccaria** (University of Salento, Lecce)
Subject(s)	Specific problems in quantum field theories, in particular two-dimensional conformal field theories and supersymmetric gauge models. Specific models in stochastic system theory, in particular to information propagation and evolutionary games on complex networks.
Dates	2015 - 2018
Collaborator	Dr. **Guido Macorini** (Salento University, Lecce)
Subject(s)	Technical aspects of conformal field theories, with particular attention to the study of Virasoro conformal blocks in the context of AdS/CFT and AGT dualities.
Dates	2015 - 2018
Collaborator	Prof. **Eleonora Alfinito** (Salento University, Lecce)
Subject(s)	Graph theory, dynamics and statistical mechanics of complex networks, in particular for application to game theory and design of immunization strategies on real-world networks.

Dates	2016
Collaborator	Prof. **Luigi Martina** (Salento University, Lecce)
Subject(s)	$\mathcal{N} = 2$ supersymmetric gauge theories and integrable systems.
Dates	2016 - 2017
Collaborator	Dr. **Davide Fioravanti** (Alma Mater Studiorum University, Bologna)
Subject(s)	$\mathcal{N} = 2$ supersymmetric gauge theories, with particular interest for their Ω-deformed versions (in particular for Nekrasov prepotential and partition function) and their relation with integrable systems and conformal field theories.
Dates	2017 - Today
Collaborator	Dr. **Adriano Barra** (Salento University, Lecce)
Subject(s)	Statistical mechanics for Artificial Intelligence, in particular neural networks and machine-learning, consisting in the development and analysis of new archetypes of associative memory models and their learning duals. Statistical analysis of complex systems of biological interest.
Dates	2018 - Today
Collaborator	Dr. **Elena Agliari** (La Sapienza University, Rome)
Subject(s)	Statistical mechanics for Artificial Intelligence, in particular neural networks and machine-learning, consisting in the development and analysis of new archetypes of associative memory models and their learning duals. Statistical analysis of complex systems of biological interest.
Dates	2018 - Today
Collaborator	Dr. **Alessandro Canali** (La Sapienza University, Rome)
Subject(s)	Statistical mechanics of complex networks, in particular neural networks and machine-learning.
Dates	2018 - Today
Collaborator	Dr. **Francesco Alemanno** (Salento University, Lecce)
Subject(s)	Statistical mechanics for Artificial Intelligence, in particular neural networks and machine-learning, consisting in the development and analysis of new archetypes of associative memory models and their learning duals. Statistical analysis of complex systems of biological interest.
Dates	2018 - Today
Collaborator	Dr. **Martino Centonze** (Salento University, Lecce)
Subject(s)	Statistical mechanics of complex networks, in particular neural networks and machine-learning.
Dates	2019 - Today
Collaborator	Prof. **Orazio Barra** (University of Calabria, Cosenza)
Subject(s)	Statistical inference and machine learning solutions for the classification of cardiological pathologies.
Dates	2020 - Today
Collaborator	Dr. **Loretta Del Mercato** (CNR Nanotec, Lecce)
Subject(s)	Data analysis and statistical inference for the study of biological dynamics, especially concerning stroma-cancer interaction modifications after the usage of specific chemioterapic drugs.

Research travels

Dates	May 2016, 3-25 November 2016, 24 - December 2016, 4 May 2017, 21 - June 2017, 1
Location	**Alma Mater Studiorum University**, Bologna (IT)
Referent	Dr. Davide Fioravanti
Dates	February 2018, 8-9 July 2018, 15-17
Location	**La Sapienza University**, Rome (IT)
Referent	Dr. Elena Agliari
Dates	October 2018, 1-5
Location	**King's College London**, London (UK)
Referent(s)	Dr. Alessia Annibale

Partecipations

Conferences

Dates	August 2016, 22-26
Title of the conference	**Integrability in Gauge and String Theory**, IGST 2016
Organization	Humboldt Berlin University
Location	Berlin (DE)
Subject(s)	Integrability features in holographic systems such as the AdS/CFT correspondence in various dimensions and in supersymmetric models such as $\mathcal{N}=2$ and $\mathcal{N}=4$ gauge theories.
Dates	June 2017, 6-10
Title of the conference	**XXVth International Conference on Integrable Systems and Quantum Symmetries** , ISQS25
Organization	Department of Mathematics, Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University Prague Bogoliubov Laboratory of Theoretical Physics of the Joint Institute for Nuclear Research.
Location	Prague (CZE)
Subject(s)	Main topics covered in the conference: quantum integrable systems; quantum groups; noncommutative geometry; quantum space-times and their quantum symmetries; discrete Integrable Systems and Painlevé equations; supersymmetry and integrability; spectral asymptotics of quantum integrable system; higher spin field theory; modern mathematical methods.
Dates	June 2017, 17-24
Title of the conference	**Physics and Mathematics of Nonlinear Phenomena - "50 years of IST"**, PMNP2017
Organization	Salento University
Location	Gallipoli (IT)

Subject(s)	Main topics covered in the conference: discovery and development of the IST method; state of the art and perspectives; Hamiltonian, geometric and algebraic aspects of integrable systems; integrable nonlinear equations in physics; integrability and mathematics.
Dates	May 2018, 18
Title of the conference	**Scent of Copulas**
Organization	Salento University
Location	Lecce (IT)
Description	Celebrative conference for the 70th birthday of Prof. Carlo Sempi
Subject(s)	The conference focuses on dependence models and copulas, and their use in several fields (such as Statistics, Finance, Environmental Sciences, and more).
Dates	April 2020, 27-28
Title of the conference	**Mathematical Methods and Models in Machine Learning**
Organization	Alma Mater Studiorum (Department of Mathematics)
Location	Bologna (IT) - Online conference because of COVID-19 lockdown
Subject(s)	The purpose of the conference is to present recent results on mathematical methods and models related to machine learning and link researchers coming from different areas.
Dates	July 2020, 1-2/7-8
Title of the conference	**Stochastic models for complex systems**, SMOCS2020
Organizations	Università degli Studi di Salerno, Università degli Studi di Napoli Federico II, Unisalento
Location	Online conference because of COVID-19 restictions
Subject(s)	Mathematical and statistical mechanics of stochastic phenomena for complex systems.

Schools

Dates	September 2016, 5-10
Title of the school	**Parma International School of Theoretical Physics** (VII edition), 2016
Organization	Parma University
Location	Parma (IT)
Subject(s)	Advanced topics for path-integral in QFTs, with particular reference to resurgence, Lefschetz thimbles and non-perturbative methods.
Dates	September 2017, 3-8
Title of the school	**IV Mediterranean School of Complex Networks**, 2017
Location	Salina, Sicily (IT)
Subject(s)	Basics insights in network science from a statistical physics point of view, with particular reference to multilayer networks and their specific application to real world-problems.
Dates	October 2019, 7-11
Title of the school	**Mathematical and Computational Aspects of Machine Learning**, 2019
Location	Scuola Normale di Pisa, Pisa (IT)
Subject(s)	The present school aims at connecting international experts at the forefront of research on the mathematical and computational aspects of the problem with the interested scholars, especially the young generations.

Social events

Dates	September 2017, 29
Title of the event	**"Notte europea dei ricercatori" (European Researchers' Night 2017)**
Location	Lecce (IT)
Subject(s)	Public event dedicated to popular science. I took part discussing with people interested in complex systems and artificial intelligence.

Dates	September 2019, 27
Title of the event	**"Notte europea dei ricercatori" (European Researchers' Night 2019)**
Location	Lecce (IT)
Subject(s)	Public event dedicated to popular science. I took part discussing with people interested in complex systems and artificial intelligence.

Other courses

Dates	June 2019, 10-20
Prof.	Giorgio Buttazzo - Scuola Superiore Sant'Anna (Pisa)
Title of the event	**Neural Networks and Deep Learning**
Institution	Salento University
Location	Lecce (IT)
Subject(s)	Intensive course about Artificial Intelligence, machine learning and neural networks, with a particular interest in applications.

Teaching and supervising activity

Teaching

Period	May, 2018
Course	Complex Systems
Reference	Dr. Adriano Barra
Institution	**ISUFI** school (Salento University)
Subjects	The lessons consist in the presentation of mathematical tools for dealing with complex systems, in particular for the application of replica trick and Guerra's interpolation method for the resolution of the Sherrington-Kirkpatrick and Hopfield models.

Period	February - July, 2020
Course	Mathematics for Economy and Finance
Reference	Dr. Luca Anzilli
Role	Practical exercises tutor
Institution	**Department of Economic Sciences** (Salento University)
Subjects	General notions on set theory, with particular regard to real numbers' theory. Elements of real analysis and functions of one real variable. Continuity, differentiability and integrability. General notions on differential calculus for functions of two real varaibles, numerical series and linear systems.

Period	November, 2020 - Today
Course	Mathematics for Economy and Finance
Reference	Dr. Luca Anzilli
Role	Practical exercises tutor
Institution	**Department of Economic Sciences** (Salento University)
Subjects	General notions on set theory, with particular regard to real numbers' theory. Elements of real analysis and functions of one real variable. Continuity, differentiability and integrability. General notions on differential calculus for functions of two real varaibles, numerical series and linear systems. Real functions of two real variables, limits and partial differentiation. Constrained extremal problems. Planar geometry.

Supervising

Period	July, 2018
Activity	External supervisor for Master Degree Thesis
Field	Applied Mathematics
Candidate	Chiara Marullo
Title	Neural network beyond the Hebbian paradigma
Reference	Dr. Elena Agliari
Institution	**La Sapienza** University (Rome)
Subjects	Quantitative analysis of dreaming neural networks with dilution.
Level in national or international classification	110/110

External projects

Technical advices

Period	January - July, 2018
Partner(s)	**RedBit Games**, Rome
Subject of the collaboration	The subject of the collaboration concerned a data analysis of Jelly Juice application database by RedBit Games from a statistical inference perspective. The goal was to define user classes according to their customs in game and to target them with specific quantitative labels (through a principal component analysis), in order to realize targeted and optimized advertising campaigns.

Scientific activity

Selected papers

1. *Dreaming neural networks: forgetting spurious memories and reinforcing pure ones*, E. Agliari, A. Barra and A. Fachechi
Published in **Neural Networks**, April 2019

ABSTRACT: The standard Hopfield model for associative neural networks accounts for biological Hebbian learning and acts as the harmonic oscillator for pattern recognition, however its maximal storage capacity is $\alpha \sim 0.14$, far from the theoretical bound for symmetric networks, *i.e.* $\alpha = 1$. Inspired by sleeping and dreaming mechanisms in mammal brains, we propose an extension of this model displaying the standard on-line (awake) learning mechanism (that allows the storage of external information in terms of patterns) and an off-line (sleep) unlearning&consolidating mechanism (that allows spurious-pattern removal and pure-pattern reinforcement): this obtained daily prescription is able to saturate the theoretical bound $\alpha = 1$, remaining also extremely robust against thermal noise. The emergent neural and synaptic features are analyzed both analytically and numerically. In particular, beyond obtaining a phase diagram for neural dynamics, we focus on synaptic plasticity and we give explicit prescriptions on the temporal evolution of the synaptic matrix. We analytically prove that our algorithm makes the Hebbian kernel converge with high probability to the projection matrix built over the pure stored patterns. Furthermore, we obtain a sharp and explicit estimate for the "sleep rate" in order to ensure such a convergence. Finally, we run extensive numerical simulations (mainly Monte Carlo sampling) to check the approximations underlying the analytical investigations (*e.g.*, we developed the whole theory at the so called replica-symmetric level, as standard in the Amit–Gutfreund–Sompolinsky reference framework) and possible finite-size effects, finding overall full agreement with the theory.

Total number of citations: 16.
Total number of reads on ResearchGate: 249.
Additional informations: the paper received strong attention from the generalist press.

2. *A new mechanical approach to handle generalized Hopfield neural networks*, A. Barra, M. Beccaria and A. Fachechi
Published on **Neural Networks**, October 2018

ABSTRACT: We propose a modification of the cost function of the Hopfield model whose salient features shine in its Taylor expansion and result in more than pairwise interactions with alternate signs, suggesting a unified framework for handling both with deep learning and network pruning. In our analysis, we heavily rely on the Hamilton–Jacobi correspondence relating the statistical model with a mechanical system. In this picture, our model is nothing but the relativistic extension of the original Hopfield model (whose cost function is a quadratic form in the Mattis magnetization and mimics the non-relativistic counterpart, the so-called classical limit). We focus on the low-storage regime and solve the model analytically by taking advantage of the mechanical analogy, thus obtaining a complete characterization of the free energy and the associated self-consistency equations in the thermodynamic limit. Further, on the numerical side, we test the performances of our proposal with extensive Monte Carlo simulations, showing that the stability of spurious states (limiting the capabilities of the standard Hebbian construction) is sensibly reduced due to presence of unlearning contributions that prune them massively.

Total number of citations: 25.
Total number of reads on ResearchGate: 268.

3. *Virasoro vacuum block at next-to-leading order in the heavy-light limit*, M. Beccaria, A. Fachechi and G. Macorini
Published on **JHEP**, February 2016

ABSTRACT: We consider the semiclassical limit of the vacuum Virasoro block describing the diagonal 4-point correlation functions on the sphere. At large central charge c, after exponentiation, it depends on two fixed ratios h_H/c and h_L/c, where $h_{H,L}$ are the conformal dimensions of the 4-point function operators. The semiclassical block may be expanded in powers of the light ratio h_L/c and the leading non-trivial (linear) order is known in closed form as a function of h_H/c. Recently, this contribution has been matched against AdS_3 gravity calculations where heavy operators build up a classical geometry corresponding to a BTZ black hole, while the light operators are described by a geodesic in this background. Here, we compute for the first time the next-to-leading quadratic correction $O((h_L/c)^2)$, again in closed form for generic heavy operator ratio h_H/c. The result is a highly non-trivial extension of the leading order and may be relevant for further refined AdS_3/CFT_2 tests. Applications to the two-interval Rényi entropy are also presented.

Total number of citations: 39.
Total number of reads on ResearchGate: 68.

Full list of publications

1. M. Beccaria, A. Fachechi and G. Macorini
Virasoro vacuum block at next-to-leading order in the heavy-light limit
[arXiv:1511.05452], November 2015
Published on **JHEP**, February 2016

2. M. Beccaria, A. Fachechi and G. Macorini
On the cusp anomalous dimension in the ladder limit of $\mathcal{N} = 4$ SYM
[arXiv:1604.00897], April 2016
Published on **JHEP** (IF at publication time $= 6.063$), June 2016

3. M. Beccaria, A. Fachechi, G. Macorini and L. Martina
Exact partition functions for the Ω-deformed $\mathcal{N} = 2$ $SU(2)$ gauge theory with $N_f = 4$ flavours
[arXiv:1609.01189], September 2016
Published on **JHEP**, December 2016

4. E. Alfinito, M. Beccaria, A. Fachechi and G. Macorini
Reactive immunization on complex networks
[arXiv:1701.03943], January 2017
Published on **EPL** (IF at publication time $= 1.957$), February 2017

5. M. Beccaria, A. Fachechi and G. Macorini
Chiral trace relations in Ω-deformed $\mathcal{N} = 2$ theories
[arXiv:1702.01254] - February 2017
Published on **JHEP**, May 2017

6. E. Alfinito, A. Barra, M. Beccaria, A. Fachechi and G. Macorini
Global awareness and risk-aversion, an evolutionary game model for behavioral gambit of loyalists
[arXiv:1801.05373], January 2018
Published on **EPL**, March 2018

7. A. Barra, M. Beccaria and A. Fachechi
A new mechanical approach to handle generalized Hopfield neural networks
[arXiv:1801.01743], January 2018
Published on **Neural Networks**, October 2018

8. E. Agliari, A. Barra and A. Fachechi
Dreaming neural networks: forgetting spurious memories and reinforcing pure ones
[arXiv:1810.12217] - January 2018
Published in **Neural Networks**, April 2019

9. E. Agliari, A. Barra, F. Alemanno and A. Fachechi
A novel derivation of the Marchenko-Pastur law through analog bipartite spin-glasses
[arXiv:1811.08298], November 2018
Published in **JPhysA**, (Journal of Physics A: Mathematical and Theoretical - special issue for Giorgio Parisi 70th birthday), as *On the Marchenko-Pastur law in analog bipartite spin-glasses*, April 2019.

10. E. Agliari, F. Alemanno, A. Barra, A. Fachechi
Dreaming neural networks: rigorous results
[arXiv:1812.09077], December 2018
Published in **JStat** (Journal of Statistical Mechanics: Theory and Experiment), August 2019.

11. E. Agliari, F. Alemanno, A. Barra, M. Centonze, A. Fachechi
Neural networks with redundant representation: detecting the undetectable
[arXiv:1911.12689], November 2019
Published in **PRL** (Physical Review Letters), January 2020.

12. F. Alemanno, M. Centonze, A. Fachechi
Interpolating between boolean and extremely high noisy patterns through Dense Associative Memories
[arXiv:1912.00666], December 2019
Published in **JPhysA** (Journal of Physics A: Mathematical and Theoretical - special issue "Machine Learning and Statistical Physics: Theory, Inspiration, Application"), January 2020

13. E. Agliari, F. Alemanno, A. Barra, A. Fachechi
Generalized Guerra's interpolation schemes for dense associative neural networks
[arXiv:1911.12707], November 2019
Published in **Neural Networks**, May 2020

14. E. Agliari, A. Barra, O. A. Barra, A. Fachechi, L. Franceschi-Vento, L. Moretti
Detecting cardiac pathologies via machine learning on heart-rate variability time series and related markers
Published in **SciRep** (Nature Scientific Reports), June 2020 (link)

15. E. Agliari, F.Alemanno, A. Barra, O. A. Barra, A. Fachechi, L. Franceschi-Vento, L. Moretti
Analysis of temporal correlation in heart rate variability through maximum entropy principle in a minimal pairwise glassy model
Published in **SciRep** (Nature Scientific Reports), September 2020 (link)

16. E. Agliari, A. Fachechi, C. Marullo
The "relativistic" Hopfield model with correlated patterns
Submitted to **JMP** (Journal of Mathematical Physics), April 2020

17. A. Fachechi
PDE/statistical mechanics duality: relation between Guerra's interpolated p-spin ferromagnets and the Burgers hierarchy
Submitted to **JSP** (Journal of Statistical Physics), September 2020

18. E. Agliari, F. Alemanno, A. Barra, A. Fachechi
Dreaming neural networks: learning while sleeping through decorrelating contrastive divergence
In preparation

Conference papers/Proceedings

1. E. Alfinito, M. Beccaria, A. Fachechi and G. Macorini
Probing complexity with epidemics: a new reactive immunization strategy
Proceedings of the 2nd International Conference on Complexity, Future Information Systems and Risk (COMPLEXIS 2017)
ISBN: 978-989-758-244-8, edited by **SciTePress**, DOI: 10.5220/0006361301160123, link

2. M. Beccaria, A. Fachechi and G. Macorini
Chiral trace relations in Ω-deformed $\mathcal{N} = 2$ theories
Proceedings of XXVth International Conference on Integrable Systems and Quantum symmetries (ISQS25)
Published in **JPCS** and edited by **IopScience**, Vol. 965 (2018) 012013, link

3. M. Beccaria, A. Fachechi and G. Macorini
Chiral trace relations in $\mathcal{N} = 2^*$ theories
Proceedings of Physics and Mathematics of Nonlinear Phenomena - "50 years of IST" (PMNP2017)
Published on **Theoretical and Mathematical Physics** and edited by **Springer**, Vol. 196:3 (2018) 390-403

List of talks/posters

1. Talk
Gauge theories: a geometrical approach
Ref. Prof. Luigi Martina
Università del Salento, Lecce (IT), 23/11/2016

2. Talk
Basics in instanton counting - Physics beyond the perturbative regime,
Refs. Prof. Luigi Martina and Dr. Luca Girlanda
Università del Salento, Lecce (IT), 10/04/2017

3. Talk
Chiral trace relations in Ω-deformed $\mathcal{N} = 2$ theories, based on the works 5
XXVth International Conference on Integrable Systems and Quantum symmetries, Prague University (CZ), 08/06/2017

4. Talk
Chiral trace relations in Ω-deformed $\mathcal{N} = 2$ theories, based on the works 5
Physics and Mathematics of Nonlinear Phenomena - "50 years of IST", Gallipoli (IT), 21/06/2017

5. Talk
Global and local complexities in the immunization problem, based on the work 4
Mediterranean School of Complex Networks (MSCX) - IV edition, Salina (IT), 04/09/2017

6. Talk
   Sleeping in Hopfield neural networks: some recent results, based on the work 8
   Ref. Dr. Alessia Annibale
   King's College London, London (UK), 03/10/2018

7. Talk
   Reti di Hopfield nella fase REM, based on the work 8
   Ref. Dr. Adriano Barra
   Unisalento, Lecce (IT), 19/12/2018

8. Didactic talk
   Uno sguardo semplice alla complessità - Sistemi complessi e intelligenza artificiale
   "Popular University" Association, Galatina (IT), 09/04/2018

9. Poster
   On the cusp anomalous dimension in the ladder limit of $\mathcal{N} = 4$ SYM, based on the work 1
   IGST (Integrability in Gauge and String Theory), Humboldt University, Berlin (DE), 22/08/2016

10. Poster
    Quantising $\mathcal{N} = 2^* SU(2)$ gauge theory: integrability and modular anomaly
    Physics and Mathematics of Nonlinear Phenomena - "50 years of IST", Gallipoli (IT), 20/06/2017

Reviewing and editorial activity

1. 2017 - Today
   Referee for Nature Scientific Reports (SciRep), **Nature Publishing Group**
   Number of peer-reviewed papers: 4

2. 2018 - Today
   Review Editor for **Frontiers in Physics** in Social Physics

3. 2018 - Today
   Referee for Helyion, **Elsevier**
   Number of peer-reviewed papers: 1

4. 2018 - Today
   Referee for Journal of Mathematical Physics (JMP), **AIP Publishing**
   Number of peer-reviewed papers: 1

5. 2019 - Today
   Referee for Journal of Physics A: Mathematical and Theoretical (JPhysA), **IOP Publishing**
   Number of peer-reviewed papers: 1

* 2020
Awarded as Trusted Reviewer by **IOP Publishing**

People talking about our work

1. Divulgative communication
   A New Mathematical Tool For Artificial Intelligence Borrowed From Physics, based on the work 7
   Written by A. Barra and published on **ScienceTrends** [link]
   October 2018
2. Divulgative communication
   If Neural Networks Are Allowed To Sleep And Dream, Their Performance Sensibly Increases, based on the work 8
   Written by A. Barra and published on **ScienceTrends** [link]
   February 2019
3. Divulgative communication
   Anche l'Intelligenza Artificiale ha bisogno di dormire, based on the work 8
   Published on **Ansa.it** (Scienza&Tecnica) [link], February 2019
4. Divulgative communication
   L'Intelligenza Artificiale sa dormire e pare ne abbia bisogno. Forse un giorno sognerà, based on the work 8
   Published on **Repubblica.it** Tecnologia [link], February 2019
5. Divulgative communication
   Con un buon sonno anche l'Intelligenza Artificiale migliora, based on the work 8
   Published on **TG24 Sky** Tecnologia [link], February 2019
6. Divulgative communication
   Così l'Intelligenza artificiale "dorme" e dopo immagazzina più informazioni, based on the work 8
   Published on **IlFattoQuotidiano.it** Scienza [link], February 2019
7. Divulgative communication
   L'Intelligenza Artificiale sa dormire, e forse sognerà, based on the work 8
   Published on **IlSole24Ore** Ricerca (Video) [link], February 2019
8. Other divulgative articles related to the work 8:
   Researchers Made an AI Whose Performance Increases if They Let It Sleep And Dream, [link], February 2019
   L'Intelligenza Artificiale sa dormire, e forse sognerà, [link], February 2019
9. Divulgative communication
   Why Machines Need to Dream, based on the work 8
   Published on **OneZero** [link], June 2019
10. Divulgative communication
    I misteri del sonno, based on the work 8
    Special interview in **Speciale Tg1** (8/12/2019 edition) [link], December 2019

DAVIDE FERMI

Curriculum Vitae et Studiorum

Personal Data

Name and surname:	Davide Fermi
Webpage:	https://fermidavide.com
Spoken Languages:	Italian: mother tongue English: fluent
Orcid ID:	0000-0002-4651-1784
Scopus Author ID:	54383178400
Researcher ID:	S-6536-2018
MR Author ID:	1142559

Academic Positions

02/03/2020 - present — **Postdoc**, Scuola Normale Superiore, Classe di Scienze (Pisa, Italy)
Project: "*Aspetti Matematici della Fisica della Materia Condensata*" (transl. "*Mathematical Aspects of Condensed Matter Physics*")
Supervisor: Prof. Michele Correggi
Expected end date: 01/03/2021 (tempo determinato)

01/12/2016 - 29/02/2020 — **Postdoc**, Università degli Studi di Milano, Mathematics Department (Milano, Italy)
Project: "*Metodi Analitici e Geometrici per le Equazioni Differenziali e la Teoria Quantistica dei Campi*" (transl. "*Analytical and Geometrical Methods for Differential Equations and Quantum Field Theory*")
Supervisors: Prof. Marco M. Peloso and Prof. Livio Pizzocchero

15/04/2016 - 30/11/2016 — **Postdoc**, Università degli Studi dell'Insubria, DiSAT (Como, Italy)
Project: "*Problemi matematici nella fisica della materia condensata - FIR 2013*" (transl. "*Mathematical Problems in Condensed Matter Physics*")
Supervisors: Dr. Claudio Cacciapuoti and Prof. Andrea Posilicano

Qualifications and Education

2020 — **Abilitazione Scientifica Nazionale** for *Associate Professor* in Mathematical Physics
(Professore di II Fascia, s.c. 01/A4 - Fisica Matematica, valid until 09/11/2029).

2012 - 2016 — **Ph.D. degree in Mathematics**, Università degli Studi di Milano, Math. Dep. (Milano, Italy)
(XXVIII cycle, with scholarship)
Thesis: "*A functional analytic framework for local zeta regularization and the scalar Casimir effect*" defended in Milan, Italy on 22 February 2016
Advisor: Prof. Livio Pizzocchero

2010 - 2012 — **Master degree in Physics**, Università degli Studi di Milano, Physics Dep. (Milano, Italy)
Thesis: "*L'Effetto Casimir e la Regolarizzazione Zeta*" (transl. "*Zeta regularization and the Casimir effect*") defended in Milan, Italy on 24 July 2012
Marks: 110/110 *magna cum laude*
Advisor: Prof. Livio Pizzocchero
Co-advisor: Prof. Franco Gallone

2007 - 2010 — **Bachelor degree in Physics**, Università degli Studi di Milano, Physics Dep. (Milano, Italy)
Thesis: "*Lo Spaziotempo di Alcubierre*" (transl. "*Alcubierre's spacetime*") defended in Milan, Italy on 21 October 2010
Marks: 110/110 *magna cum laude*
Advisor: Prof. Livio Pizzocchero

2002 - 2007 — **Italian High School diploma**, Liceo Scientifico Statale Giordano Bruno, Melzo (Milan, Italy)
(diploma di Maturità Scientifica PNI - Piano Nazionale Informatica)
Marks: 100/100

Honors and awards

11/2020 **Winner** of a 1 – year postdoc scholarship (assegno di ricerca),
funded by Università degli Studi di Roma "La Sapienza", Mathematics Dep. (Roma, Italy)
Selection committee: Dott. Domenico Monaco, Prof. Gianluca Panati, Prof. Alessandro Teta

2019/2020 **Shortlisted** (6^{th} place, >20 partecipants) for a permanent full-time researcher position at INdAM
(concorso pubblico per titoli ed esami per l'assunzione con contratto di lavoro a tempo pieno
e indeterminato di una unità di personale Profilo Ricercatore, III Livello Professionale
presso l'Istituto Nazionale di Alta Matematica "Francesco Severi"),
Selection procedure: 1 preliminary written evaluation, 2 written exams, 1 oral exam
(8 partecipants selected for final stage).
Selection committee: Prof. Dario Bambusi, Prof. Carla Manni, Prof. Marco Romito

01/2020 **Winner** (2 partecipants) of a 2 – years postdoc scholarship (assegno di ricerca) at SISSA, Trieste,
funded by ERC Starting Grant "*MaMBoQ-Macroscopic Behavior of Many-Body Quantum Systems*"
(I renounced the assignment in favour of a postdoc scholarship at Scuola Normale Superiore).
Selection committee: Prof. Gianni dal Maso, Prof. Marcello Porta, Prof. Ludwik Dabrowski

01/2020 **Winner** (2 partecipants) of a 1 – year postdoc scholarship (assegno di ricerca),
funded by Scuola Normale Superiore (Faculty of Sciences).
Selection committee: Prof. Michele Correggi, Prof. Andrea Malchiodi, Prof. Stefano Marmi

07/2019 **Shortlisted** for a non-tenured researcher position in mathematical physics
(Ricercatore a Tempo Determinato di tipo a, s.c. 01/A4, s.s.d. MAT/07),
Università degli Studi di Roma "La Sapienza", Mathematics Dep. (Roma, Italy).
Selection committee: Prof. Alessandro Giuliani, Prof. Diego D. Noja, Prof. Alessandro Teta

05/2019 **Shortlisted** for a non-tenured researcher position in mathematical physics
(Ricercatore a Tempo Determinato di tipo a, s.c. 01/A4, s.s.d. MAT/07),
Università degli Studi di Firenze, Dip. di Matematica e Informatica "Ulisse Dini" (Firenze, Italy).
Selection committee: Prof. Luigi Barletti, Prof. Luigi Preziosi, Prof. Fabio Rosso

02/2019 **Shortlisted** for a non-tenured researcher position in mathematical physics
(Ricercatore a Tempo Determinato di tipo a, s.c. 01/A4, s.s.d. MAT/07),
Università degli Studi di Milano Bicocca, Dip. di Matematica e Applicazioni (Milano, Italy).
Selection committee: Prof. Gregorio Falqui, Prof. Annalisa Marzuoli, Prof. Marco Pedroni

11/2018 **Shortlisted** for a non-tenured researcher position in mathematical physics
(Ricercatore a Tempo Determinato di tipo a, s.c. 01/A4, s.s.d. MAT/07),
GSSI - Gran Sasso Science Institute (l'Aquila, Italy).
Selection committee: Prof. Paolo Buttà, Prof. Andrea Sacchetti, Prof. Alessandro Teta

05/2018 **Shortlisted** for a non-tenured researcher position in mathematical physics
(Ricercatore a Tempo Determinato di tipo a, s.c. 01/A4, s.s.d. MAT/07),
Università Cattolica del Sacro Cuore, Facoltà di Scienze matematiche, fisiche e naturali (Brescia, Italy).
Selection committee: Prof. Paolo Maremonti, Prof. Alfredo Marzocchi, Prof. Luciano Teresi

08/2016 **Winner** (2^{nd} place, 7 partecipants) of a 2 – years renewable postdoc scholarship (assegno di ricerca),
funded by Università degli Studi di Milano, Mathematics Dep. (Milano, Italy).
Selection committee: Prof. Giovanni Gallavotti, Prof. Valter Moretti, Prof. Marco Rigoli

03/2016 **Winner** (3 partecipants) of a 1 – year postdoc scholarship (assegno di ricerca),
funded by FIR project 2014-2017 "*COND-MATH - Condensed Matter in Mathematical Physics*",
Università degli Studi dell'Insubria, DiSAT (Como, Italy).
Selection committee: Prof. Claudio Cacciapuoti, Prof. Andrea Posilicano, Dott.ssa Stefania Ugolini

11/2012 **Winner** (1^{st} place, 26 partecipants) of a 3 – years Ph.D. scholarship funded by MIUR (Italy),
Università degli Studi di Milano, Mathematics Dep. (Milano, Italy).
Selection committee: Prof. Livio Pizzocchero, Prof. Paolo Stellari, Prof. Enrico Valdinoci

Scientific Works

Preprints

3. M. Correggi, D. Fermi,
Magnetic perturbations of anyonic and Aharonov-Bohm Schrdinger operators,
arXiv:2006.09056 [math-ph] (2020); submitted

2. C. Cacciapuoti, D. Fermi, A. Posilicano,
The semiclassical limit on a star-graph with Kirchhoff conditions,
arXiv:2005.03790 [math-ph] (2020)
to appear in Analysis and Mathematical Physics

1. C. Cacciapuoti, D. Fermi, A. Posilicano,
Scattering theory for delta-potentials supported by locally deformed planes,
to appear in A. Michelangeli (Ed.), "Mathematical Challenges of Zero-Range Physics", Springer (2021)

Books

1. D. Fermi, L. Pizzocchero,
Local zeta regularization and the scalar Casimir effect. A general approach based on integral kernels,
World Scientific Publishing, Singapore (2017) [276 pages]
ISBN: 978-981-3224-99-5 (hardcover), ISBN: 978-981-3225-01-5 (ebook); arXiv:1505.00711, arXiv:1505.01044.

Published papers

13. D. Fermi, M. Gengo, L. Pizzocchero,
Integrable scalar cosmologies with matter and curvature,
Nucl. Phys. B **957** (2020), 115095 [102 pages].
DOI:10.1016/j.nuclphysb.2020.115095 ; arXiv:2001.03228 [gr-qc]

12. C. Cacciapuoti, D. Fermi, A. Posilicano,
The semi-classical limit with a delta potential,
Annali di Matematica Pura ed Applicata (2020), *online first* [37 pages].
DOI:10.1007/s10231-020-01002-4 ; arXiv:1907.05801 [math-ph]

11. D. Fermi,
The Casimir energy anomaly for a point interaction,
Mod. Phys. Lett. A **35**(03) (2020), 2040008 [5 pages]
DOI:10.1142/S0217732320400088 ; arXiv:1909.00604 [math-ph]

10. D. Fermi,
Some remarks on a new exotic spacetime for time travel by free fall,
pp. 243–265 in S. Cacciatori, B. Güneysu, S. Pigola (Eds.), "Einstein Equations: Physical and Mathematical Aspects of General Relativity. DOMOSCHOOL 2018", Birkhäuser, Cham, Springer Nature Switzerland AG (2019) [23 pages].
DOI:10.1007/978-3-030-18061-4_8 ; arXiv:1812.09021 [gr-qc]

9. D. Fermi, M. Gengo, L. Pizzocchero,
On the necessity of phantom fields for solving the horizon problem in scalar cosmologies,
Universe **2019**, 5(3) (2019), 76 [20 pages]
(invited feature article).
DOI:10.3390/universe5030076 ; arXiv:1901.11511 [gr-qc]

8. C. Cacciapuoti, D. Fermi, A. Posilicano,
Scattering from local deformations of a semitransparent plane,
J. Math. Anal. Appl. **473**(1) (2019), 215-257 [43 pages]
DOI:10.1016/j.jmaa.2018.12.045 ; arXiv:1807.07916 [math-ph]
Corrigendum,
J. Math. Anal. Appl. **482**(1) (2020), 123554 [2 pages]
DOI:10.1016/j.jmaa.2019.123554

7. C. Cacciapuoti, D. Fermi, A. Posilicano,
On inverses of Krein's Q-functions,
Rend. Mat. Appl. (7) **39**(2) (2018), 229–240 [12 pages].
Editor's page ; arXiv:1809.05150 [math.SP]

6. D. Fermi, L. Pizzocchero,
A time machine for free fall into the past,
Class. Quant. Grav. **35**(16) (2018), 165003 [42 pages].
DOI:10.1088/1361-6382/aace6e ; arXiv:1803.08214 [gr-qc]

5. D. Fermi, L. Pizzocchero,
Local Casimir Effect for a Scalar Field in Presence of a Point Impurity,
Symmetry **2018**, **10**(2) (2018), 38 [20 pages]
(invited contribution in I. H. Brevik, K. A. Milton (guest Eds.), Special Issue of Symmetry "Casimir Physics and Applications").
DOI:10.3390/sym10020038 ; arXiv:1712.10039 [math-ph]

4. C. Cacciapuoti, D. Fermi, A. Posilicano,
Relative-Zeta and Casimir energy for a semitransparent hyperplane selecting transverse modes,
pp. 71–97 in G.F. DellAntonio and A. Michelangeli (Eds.), "Advances in Quantum Mechanics: contemporary trends and open problems", Springer (2017) [26 pages].
DOI:10.1007/978-3-319-58904-6_5 ; arXiv:1702.05296 [math-ph]

3. D. Fermi, L. Pizzocchero,
Local zeta regularization and the scalar Casimir effect IV. The case of a rectangular box,
Int. J. Mod. Phys. A **31**(04&05) (2016), 1650003 [56 pages].
DOI:10.1142/S0217751X16500032 ; arXiv:1505.03276 [math-ph]

2. D. Fermi, L. Pizzocchero,
Local zeta regularization and the scalar Casimir effect III. The case with a background harmonic potential,
Int. J. Mod. Phys. A **30**(35) (2015), 1550213 [42 pages].
DOI:10.1142/S0217751X15502139 ; arXiv:1505.01651 [math-ph]

1. D. Fermi, L. Pizzocchero,
Local Zeta Regularization and the Casimir Effect,
Prog. Theor. Phys. **126**(3) (2011), 419 – 434 [15 pages].
DOI:10.1143/PTP.126.419 ; arXiv:1104.4330 [math-ph]

Invited Talks

2019 "*Casimir energy and relative zeta function for a semitransparent plane*",
Dipartimento di Matematica, Università degli Studi di Genova, 21 May 2019.

2019 "*Zeta regularization in the scalar Casimir effect*",
invited talk at *1st Vacuum Fluctuations at Nanoscale and Gravitation conference: theory and experiments*,
Orosei, 28 April – 3 May 2019.

2018 "*Free fall into the past. A time-orientable spacetime model with closed timelike curves and no curvature singularity*",
Dipartimento di Matematica, Università degli Studi di Milano, 18 January 2018.

2017 "*Local Casimir effect and ζ-regularization: scalar field in a rectangular box*",
invited talk at *QFT Day in Milan: mathematical aspects of renormalization*,
Dipartimento di Matematica, Università degli Studi di Milano, 13 April 2017.

2017 "*Zeta regularization and Casimir effect for a scalar field with singular background potentials*",
invited talk at *Microlocal analysis: a tool to explore the quantum world*,
Dipartimento di Matematica, Università degli Studi di Genova, 12–13 January 2017.

2016 "*Zeta-function regularization in Wightman scalar field theory and applications to the Casimir effect*",
invited talk at *Workshop in Mathematical Physics*,
ETH Zürich 28–30 November 2016.

2016 "*Casimir energy for singular potentials concentrated on a plane*",
invited talk at *Mathematical Challenges of Zero-Range Physics: rigorous results and open problems*,
SISSA Trieste 7–10 November 2016.

2015 "*A functional analytic framework for local zeta regularization and the scalar Casimir effect*",
Dipartimento di Matematica, Università degli Studi di Trento, 5 October 2015.

2011 "*La regolarizzazione zeta locale e l'effetto Casimir*" (transl. "*Local zeta regularization and the Casimir effect*"),
Dipartimento di Matematica, Università degli Studi di Milano, 28 June 2011.

Contributed Talks

2019 "*Scattering from local deformations of a semitransparent plane*",
contribution at *XXI Congresso dell'Unione Matematica Italiana*,
Università degli Studi di Pavia, 2–7 September 2019.

2019 "*Scalar Casimir effect for delta-type potentials*",
contribution at *10th Alexander Friedmann International Seminar on Gravitation and Cosmology, and 4th Symposium on the Casimir Effect*,
Saint Petersburg Polytechnic University, 23–29 June 2019.

2018 "*Free fall into the past*",
contribution at *DOMOSCHOOL - International Alpine School of Mathematics and Physics. Einstein's Equations: Physical and Mathematical Aspects of General Relativity*,
Domodossola, 16–20 July 2018.

2018 "*Some results on scattering theory for delta interactions concentrated on deformed planes*",
contribution at *Mathematical Challenges in Quantum Mechanics 2018*,
"Sapienza" Università degli Studi di Roma, 19–24 February 2018.

2016 "*Zeta regularization and the Casimir effect: a functional analytic framework*",
contribution at *Mathematical Challenges in Quantum Mechanics 2016*,
Bressanone, 8–13 February 2016.

2015 "*Local zeta regularization and the scalar Casimir effect*",
contribution at *Assemblea Scientifica GNFM*,
Montecatini, 22–24 October 2015.

Invited visiting

2020 Visiting professor at Scuola Normale Superiore di Pisa,
Pisa, 12–14 February 2020.

2016 Visiting scientist at SISSA (International School for Advanced Studies, Trieste),
Trieste, 26–29 September 2016.

Research Projects and Funding

- INFN Project 2017-2019: "*BELL - Fundamental Problems in Quantum Physics*"
  National coordinator: Prof. Pierantonio Zanghì
  Local coordinator: Prof. Bassano Vacchini
  Role: participant
- Progetto Giovani GNFM 2017: "*Dinamica quasi classica per il modello di polarone*"
  (transl. "*Quasi-classical dynamics for the polaron model*")
  Principal investigator: Dr. Raffaele Carlone
  Role: participant
- FIR project 2014-2017: "*COND-MATH - Condensed Matter in Mathematical Physics*"
  Principal investigator: Prof. Michele Correggi
  Role: participant (University of Insubria Unit, from 2016)
- MIUR - PRIN 2010 - 2011: "*Teorie geometriche e analitiche dei sistemi Hamiltoniani in dimensioni finite e infinite*" (transl. "*Geometric and analytic theories of Hamiltonian systems in finite and infinite dimensions*")
  National coordinator : Prof. Boris A. Dubrovin
  Local coordinator: Prof. Dario P. Bambusi
  Role: participant

Referee's activity

- *Communications in Mathematical Physics* (by Springer)
- *Classical and Quantum Gravity* (by IOP Science)
- *Journal of Statistical Physics* (by Springer)
- *International Journal of Geometric Methods in Modern Physics* (by World Scientific)
- *Journal of Physics A: Mathematical and Theoretical* (by IOP Science)
- *Journal of Physics G: Nuclear and Particle Physics* (by IOP Science)
- *European Journal of Physics* (by IOP Science)
- *European Physical Journal C* (by Springer)
- *Physica Scripta* (by IOP Science)
- *Universe* (by MDPI)

Supervised Students

- Guglielmo Moroni, M.Sc. in Theoretical Physics, Università degli Studi di Milano, Physics Department
  Thesis: "*Scalar Casimir effect on a line in presence of delta-interaction*"
  Dissertation date: 2 April 2020
  Co-supervised with Prof. Livio Pizzocchero

Teaching activity

Total hours of teaching activity: 240

Total hours of support for exams: 60

- Teaching assistant for "Fisica Matematica" (Mathematical Physics) for the B.Sc. degree in Mathematics, Università degli Studi dell'Insubria, academic year 2020/2021 (12 hours of online teaching activity).
- Teaching assistant for "Meccanica Analitica" (Analytical Mechanics) for the B.Sc. degree in Physics, Università degli Studi di Milano, academic years 2017/2018, 2018/2019, 2019/2020 (20 hours of teaching activity per year).
- Teaching assistant for "Matematica del continuo", mathematics course for the B.Sc. degree in Computer Science, Università degli Studi di Milano, academic years 2014/2015, 2015/2016 (48 hours of teaching activity, 20 hours of support for exams per year).
- Teaching assistant for "Istituzioni di matematica", mathematics course for the B.Sc. degree in Computer Science, Università degli Studi di Milano, academic year 2013/2014 (48 hours of teaching activity, 20 hours of support for exams).
- Freshmen tutor for "Corsi di azzeramento", mathematics pre-introductory course for the B.Sc. degree in Biological Sciences, Università degli Studi di Milano, September 2014 (24 hours of teaching activity).

Administration Posts

- Representative of postdoc researchers at the Department Council ("Consiglio di Dipartimento") of the Department of Mathematics, Università degli Studi di Milano, academic years 2017/2018, 2018/2019, 2019/2020.
- Member of the Didactic Board ("Collegio Didattico") of the Department of Physics, Università degli Studi di Milano, academic years 2017/2018, 2018/2019, 2019/2020.

Affiliations

- Member of the "*Unione Matematica Italiana*" (UMI) since 2019.
- Member of the "*International Association of Mathematical Physics*" (IAMP) since 2017.
- Member of the "*Istituto Nazionale di Fisica Nucleare*" (INFN, Italian National Institute for Nuclear Physics) from March 2017 to March 2020.
- Member of the "*Gruppo Nazionale per la Fisica Matematica*" (INdAM-GNFM, Italian National Group for Mathematical Physics), Section *Relatività e Teoria dei Campi* since 2015.

Research Interests

- Schrödinger operators with Aharonov-Bohm potentials; anyonic systems and fractional statistics.
- Schrödinger operators with singular potentials; perturbations of self-adjoint operators and self-adjoint extensions of symmetric operators; scattering theory for non-relativistic quantum particles; semi-classical limit; quantum graphs.
- Mathematical aspects of relativistic quantum field theories (axiomatic QFT); zeta-regularization and its applications to the renormalization of vacuum expectation values; Casimir effect for a scalar field in presence of external potentials or classical boundaries.
- Exotic solutions of Einstein's field equations; violations of the classical positive energy conditions; non-standard causal structures with closed timelike curves; scalar field models for early-stage inflation in cosmology.

Citation Metrics

	Scopus	Web of Science	Google Scholar
Number of citations	48	36	78
Average number of citations per paper	3.43	2.57	4.59
H-index	5	4	7

Attended Schools and Meetings

2020 "*Online Minisymposium: Nonlinear Dynamics in Quantum Mechanics*", http://math.jacobs-university.de/petrat/conferences/2020_nonlinear_dynamics/index.html, 1–2 October 2020.

2020 "*Mathematical Methods in Field Theory and Quantum Mechanics - GSSI-SISSA joint lectures*", https://indico.gssi.it/event/127/, June-July 2020.

2020 "*Applications of Bogoliubov Theory, Mathematical Physics of Quantum Many-Body Systems - Online Summer School*", http://nielsbenedikter.de/conference/conference.html, 19-22 June 2020.

2020 "*One World IAMP Mathematical Physics Seminar Series*", http://www.iamp.org/page.php?page=page_seminar, May-July 2020.

2020 "*Munich-Aarhus-Santiago Seminar in Mathematical Physics*", https://math.au.dk/en/projects/sqm/mas-mp-seminar/, April-June 2020.

2019 "*From semi-classical to quantum many body through normal forms*" , workshop at Dipartimento di Matematica, Università degli Studi di Milano, 17-20 December 2019.

2019 "*Meccanica quantistica e dintorni*", workshop at "Sapienza" Università di Roma, 7–8 November 2019.

2019 "*Quantum graphs and quantum random walks*", Lake Como School of Advanced Studies at Villa del Grumello, Como, 5–9 August 2019.

2019 "*Foundations and Constructive Aspects of QFT*", 43rd workshop of the LQP series at Galileo Galilei Institute, Firenze, 20–22 February 2019.

2018 "*Mathematical Challenges of Zero Range Physics: rigorous results and open problems*", INdAM workshop at "Sapienza" Università di Roma, 9–13 July 2018.

2018 "*Trails in Quantum Mechanics and Surroundings*", workshop at SISSA Trieste, 29–30 January 2018.

2017 "*Spectral and scattering theory: from selfadjoint operators to boundary value problems - Insubria Summer School in Mathematical Physics*", workshop at Department of Science, Università degli Studi dell'Insubria (Como), 18–22 September 2017.

2017 "*Fundamental problems of quantum physics*", workshop INFN BELL 2017 at Dipartimento di Fisica, Università degli Studi di Milano, 16 June 2017.

2017 "*Linear and Nonlinear Dirac Equation: advances and open problems*", workshop at Dipartimento di Scienza e Alta Tecnologia, Università degli Studi dell'Insubria (Como), 08–10 February 2017.

2016 "*EMS – IAMP Summer School in Mathematical Physics. Universality, Scaling Limits and Effective Theories*", "Sapienza" Università di Roma, 11–15 July 2016.

2016 "*Contemporary Trends in the Mathematics of Quantum Mechanics*", INdAM workshop at "Sapienza" Università di Roma, 04–08 July 2016.

2016 "*Operator Algebras and Quantum Field Theory*", workshop at Frascati INFN-LNF, 27–29 June 2016.

2016 "*Mathematical Challenges in Quantum Mechanics*", workshop at Bressanone, 8–13 February 2016.

2016 "*Geometric and Analytic Theory of Hamiltonian Systems in Finite and Infinite Dimensions*", workshop at SISSA (Trieste), 18–21 January 2016.

2015 "*Assemblea Scientifica GNFM*", workshop at Montecatini, 22–24 October 2015.

2015 "*New Trends in Algebraic Quantum Field Theory (AQFT2015)*", workshop at Frascati INFN-LNF, 11–13 February 2015.

2014 "*Operator and Geometric Analysis on Quantum Theory*", workshop at Levico Terme (Trento), 15–19 September 2014.

2014 "*Algebraic Quantum Field Theory: its status and its future*", workshop at ESI Wien, 19–23 May 2014.

2013 "*Finite and Infinite Dimensional Hamiltonian Systems*", workshop at Dipartimento di Matematica, Università di Roma Tre, 24–25 October 2013.

2013 "*Recent Advances in Partial Differential Equations and Applications*", International School at Dipartimento di Matematica, Università degli studi di Milano, 17–21 June 2013.

2013 "*Analytical Aspects of Mathematical Physics*", workshop at ETH Zürich, 27–31 May 2013.

2012 "*La geometria degli atomi e delle molecole. La Meccanica negli studi di Carlo Cercignani*", workshop at Istituto Lombardo, Accademia di Scienze e Lettere, 22 November 2012.

Last update: November 24, 2020

Anna Florio

Curriculum Vitae

Personal Information

Date of birth
Place of birth
Mail address
Mail address
Home page
Address

Address

Employment

November 2019– October 2021 **Post-doc of Fondation de Sciences Mathématiques de Paris**, *IMJ-PRG and CEREMADE*, Paris.
Advisors: *Jean-Pierre Marco* and *Jacques Féjoz*

Education

2016–2019 **Ph.D. in Mathematics**, *Avignon Université*, Avignon.
Thesis Title: *Asymptotic Maslov Indices.*
Advisor: *Marie-Claude Arnaud*, Co-advisor: *Andrea Venturelli*

2014–2016 **Master degree in Mathematics**, *Università degli Studi di Padova*, Padua, Final mark – 110/110 cum laude.
Thesis Title: *Chain recurrent sets and Lyapunov functions: from Topological Dynamics to Weak KAM Theory.*
Advisor: *Prof. Olga Bernardi*

2011–2014 **Bachelor degree in Mathematics**, *Università degli Studi di Padova*, Padua, Final mark – 110/110 cum laude.
Thesis Title: *Lorenz dynamics-exact reduction systems and applications.*
Advisor: *Prof. Franco Cardin*

2011 **Science High School Diploma**, *Liceo Scientifico "Jacopo da Montagnana"*, Montagnana (PD).
Final mark – 100/100 cum laude

Publications

A Conley-type function for the strong chain recurrent set, *Olga Bernardi, Anna Florio, Jim Wiseman*, Preprint, (2020).

Smooth conjugacy classes of 3D Axiom A flows and Spectral rigidity of hyperbolic billiards, *Anna Florio, Martin Leguil*, Preprint, (2020).

Torsion of instability zones for conservative twist maps on the annulus, *Anna Florio, Patrice Le Calvez*, To appear in *Nonlinearity*, (2020).

On the set of points of zero torsion for negative-torsion maps of the annulus, *Anna Florio*, Preprint, (2020).

The generalized recurrent set, explosions and Lyapunov functions, *Olga Bernardi, Anna Florio, Jim Wiseman, Journal of Dynamics and Differential Equations*, Vol. 32, n. 4, p. 1797–1817, (2019).

Torsion and Linking number for surface diffeomorphisms, *Anna Florio, Mathematische Zeitschrift*, Vol. 292, n.1-2, p. 231–265, (2019).

Existence of Lipschitz continuous Lyapunov function strict outside the strong chain recurrent set, *Olga Bernardi, Anna Florio, Dynamical Systems: an International Journal*, Vol. 34, n.1, p. 71–92, (2019).

A Conley-type decomposition of the strong chain recurrent set, *Olga Bernardi, Anna Florio, Ergodic Theory and Dynamical Systems*, Vol. 39, n.5, p.1261–1274, (2019).

Teaching

2021 **Vacataire (42h)**, *Université Paris Dauphine*, Paris, TD of Probability (First year).

2020 **Vacataire (36h)**, *Sorbonne Université*, Paris, TD of Basic Mathematics (First year).

2017–2019 **Monitrice**, *Université d'Avignon et des Pays de Vaucluse*, Avignon, Basic Mathematics (First year, Earth Science), Algebra (First year, Informatics and Physics) and Differential Equations (Third year, Mathematics).

March–June 2016 **Tutorship in Linear Algebra and Probability**, *Universitá degli Studi di Padova*, Padua.

Invited talks

June 2021 **13th AIMS conference**, *Atlanta (USA)*, as invited speaker.

June 2021 **Conference Weak KAM theory - XXV years later**, *Avignon (France)*, as invited speaker.

2021 **Colloque international en l'honneur de Jean-Pierre Marco**, *Paris (France)*, as invited speaker.

February 2021 **Séminaire Analyse-Probabilité**, *CEREMADE Université Paris Dauphine*, Paris (France).

February 2021 **A hyperbolic day online**, *Virtual event.*

December 2020 **Dinamici Day**, Lecce (Italy).

November 2020 **Séminaire des Systémes Dynamiques**, *IMJ-PRG*, Paris (France).

November 2020 **Séminaire de Géométrie, Topologie et Dynamique**, *Orsay*, Paris (France).

September 2020 **Wild dynamical systems**, *Banyuls-sur-mer (France)*, as invited speaker.

March 2020 **Séminaire Dynamique et Probabilités**, *LAMFA, Amiens (France).*

February 2020 **Séminaire Géométrie et Topologie**, *IMJ-PRG*, Paris (France).

January 2020 **Séminaire Symplectix**, *IHP*, Paris (France).

November 2019 **Paroles aux jeunes chercheur-es en Géométrie et Dynamique**, *Nancy (France)*, as invited speaker.

October 2019 **Post Graduate Seminar Geometry and Analysis**, *Aachen (Germany).*

August 2019 **On the Trail of Women in Mathematics**, *Krakow (Poland)*, as invited speaker.

June 2019 **Interactions of Symplectic Topology and Dynamics**, *Cortona (Italy)*, as invited speaker.

April 2019 **Oberseminar Dynamical Systems**, *Ruhr-Universität, Bochum (Germany).*

March 2019 **Conference "Real and Complex Dynamics of Hénon's Maps**, *Yokohama (Japan)*, as invited speaker.

February 2019 **Séminaire Géométries**, *ICJ, Lyon (France).*

February 2019 **Séminaire Géométrie et applications**, *IRMA, Strasbourg (France).*

September 2018 **Séminaire Dynamique et Probabilités**, *LAMFA, Amiens (France).*

April 2018 **Séminaire de Géométrie, Groupes et Dynamiques**, *UMPA, ENS Lyon (France).*

March 2018 **Séminaire de Géométrie Hamiltonienne**, *IMJ-PRG, Paris (France).*

November 2017 **Department of Mathematics "Tullio Levi-Civita"**, *University of Padua (Italy).*

November 2017 **Forum des Jeunes Mathématicien-ne-s**, *IECL, Nancy (France).*

November 2017 **Séminaire de Systémes dynamiques, Analyse et Géométrie**, *LMA, Avignon (France).*

October 2017 **1/2 journée doctorants LMA-BioSP**, *INRA, Avignon (France).*

Scientific activities and Experiences

August-September 2018 **Program Associate at MSRI (Berkeley, USA)**, *in the program Hamiltonian Systems, from topology to applications through analysis.*

Since 2017 **Member of Council of "Laboratoire de Mathématiques d'Avignon".**

October 2017 **Organization of the Math stand at "Fête de la Science".**

Since 2017 **Member of GDR CNRS Platon Géométrie, dynamique, probabilités.**

2017 **Participant at *Progetto Giovani 2017***, *GNFM*, with Prof. Olga Bernardi.

Since 2016 **Member of *Société Mathématique de France*.**

Since 2016 **Member of GNFM.**

Attended conferences and schools

June 2021 **Holomorphic curves and low dimensional topology**, *Dubrovnik (Croatia).*

May 2019 C^0 **aspects of symplectic geometry and Hamiltonian dynamics**, *Tel Aviv, Israel.*

December 2018 **Workshop on Surface Dynamics on the occasion of Patrice Le Calvez's 60th anniversary**, *Montevideo, Uruguay.*

August 2018 **Introductory Workshop: Hamiltonian Systems, from topology to applications through analysis**, *MSRI Berkeley, USA.*

August 2018 **Connections for Women: Hamiltonian Systems, from topology to applications through analysis**, *MSRI Berkeley, USA.*

April 2018 **Surfaces in Bedlewo**, *Bedlewo, Poland.*

February 2018 **Recent advances in Hamiltonian dynamics and symplectic topology**, *University of Padua, Italy*, **organizing commitee member.**

November 2017 **Forum des Jeunes Mathématicien-ne-s**, *IECL Nancy, France.*

October 2017 **Conference on Hamiltonian Systems**, *Ascona, Switzerland, organized by the ETH Institute for Theoretical Studies.*

June 2017 **15th School on Interactions between Dynamical Systems, Geometry and Partial Differential Equations**, *CRM Barcelona, Spain.*

March 2017 **Doctoral Course**, *Weak KAM and Aubry-Mather Theory*, Professor Alfonso Sorrentino and Professor Olga Bernardi.

February 2017 **Winter School in Conservative Dynamics**, *Engelberg, Switzerland, organized by the ETH Insitute for Theoretical Studies.*

January 2017 **Beyond Hamilton-Jacobi, Last call to Bordeaux**, *University of Bordeaux, Institut de Mathématiques.*

October 2016 **Surfaces in Luminy**, *Centre International de Rencontres Mathématiques, Marseille.*

June 2016 **Eleventh meeting on Nonlinear Hyperbolic PDEs and Applications**, *SISSA, Trieste.*

March 2016 **Analysis and Control on Networks: trends and perspectives**, *Padua.*

January 2016 **KukulKAM School in Conservative Dynamics**, *Merida (Mexico)*.

November 2015 **Doctoral Course**, *Applications of Canonical Perturbation Theory in Dynamical Astronomy*, Professor Christos Efthymiopoulos.

July–August 2010 **Scuola Normale Superiore di Pisa Summer Camp**, *Camigliatello Silano (CS)*.

Computer skills

Basic JAVA, Adobe Illustrator

Intermediate C++, LaTeX, Microsoft Windows, MacOs, Matlab, Mathematica

Languages

Italian **Mothertongue**

English **Fluent** *IELTS Certificate: 8.0 Overall*

French **Fluent**

Brazilian Portuguese **Basic**

Academic Positions

2020 – **Postdoctoral researcher in Mathematical Physics**,
Department of Mathematics "F. Enriques", Università degli studi di Milano, Milano (Italy),
Advisor: Vieri Mastropietro.

Education

2015–2019 **Ph.D. in Geometry and Mathematical Physics**,
Area of Mathematics, SISSA, Trieste (Italy), awarded *cum laude*,
Title of the thesis: Self-adjointness of quantum Hamiltonians with symmetry
Advisor: Alessandro Michelangeli
Date of dissertation: 30/9/2019 .
Position with scholarship

2013–2015 **Master Degree (Laurea specialistica) in Physics**,
Università degli Studi di Padova, awarded 110/110 *cum laude*
Title of the thesis: Hydrodynamics of the Fermi-Pasta-Ulam problem and its integrable aspects
Advisor: Antonio Ponno
Date of dissertation: 23/9/2015.

2010–2013 **Bachelor Degree (Laurea) in Physics**,
Università degli Studi di Padova, awarded 107/110
Title of the thesis: Gauss's least constraint principle: geometrical and mechanical aspects
Advisors: Franco Cardin, Kurt Lechner
Date of dissertation: 16/7/2013.

Publications

Published

[7] M.G., A. Michelangeli, A. Ottolini, *Kreĭn-Višik-Birman self-adjoint extension theory revisited,* Mathematical Challenges of Zero-Range Physics, INdAM-Springer series, vol. 42, 219-304 (2020)

[6] M.G., A. Michelangeli, *Self-adjoint extensions with Friedrichs lower bound,* Complex Anal. Oper. Theory **14**, 73 (2020), doi: 10.1007/s11785-020-01032-z

[5] M.G., A. Michelangeli, *Hydrogenoid spectra with central perturbations*,
Reports on Mathematical Physics, Vol. 84, Issue 2 (2019), doi: 10.1016/S0034-4877(19)30084-9

[4] M.G., A. Michelangeli, E. Pozzoli, *On Geometric quantum confinement in Grushin-type manifolds*,
Z. Angew. Math. Phys. (2019) 70:158, doi: 10.1007/s00033-019-1203-2

[3] M.G., A. Michelangeli, *Discrete spectra for critical Dirac-Coulomb Hamiltonians*,
Journal of Mathematical Physics, Vol. 59, Issue 6, doi: 10.1063/1.5011305

[2] M.G., A. Michelangeli, *Self-adjoint realisations of the Dirac-Coulomb Hamiltonian for heavy nuclei*,
A. Anal.Math.Phys. (2019) 9: 585-616. doi: 10.1007/s13324-018-0219-7

[1] M.G., *Self-adjoint extensions of Dirac-Coulomb operator*,
Advances in Quantum Mechanics pp. 169-185, doi: 10.1007/978-3-319-58904-6_10

Preprints

[11] M.G., A. Michelangeli, *Quantum particle across Grushin singularity,*
arXiv:2011.13712

[10] M.G., A. Ponno, B. Rink, *FPU and KdV: asymptotic integrability of quasi unidirectional waves,*
arXiv:2010.03520

[9] M.G., S. Pasquali, *Metastability phenomena in two-dimensional rectangular lattices with nearest-neighbour interaction,*
arXiv:1911.12648

[8] M.G., A. Michelangeli, E. Pozzoli, *Geometric confinement and dynamical transmission of a quantum particle in the Grushin cylinder,*
arXiv:2003.07128

Scientific Communications

20/8/2019 **Contributed Talk - Quantissima in the Serenissima III**,
Palazzo Pesaro-Papfava, Venice (Italy).
Title: On geometric quantum confinement in Grushin type manifolds

22/3/2019 **Seminar - Analysis Junior Seminars**,
SISSA, Trieste (Italy).
Title: On geometric quantum confinement in Grushin type manifolds

14/3/2019 **Seminar - Geometry and Mathematical Physics Seminars**,
SISSA, Trieste (Italy).
Title: What is the ergodic problem?

11/7/2018 **Invited talk - Mathematical Challenges of zero range physics: rigorous results and open problems**,
INdAM headquarters, Rome (Italy).
Title: Darwin-like perturbations of the Hydrogen spectra

22/6/2018 **Seminar - Geo & Math Phys Student Seminars**,
SISSA, Trieste (Italy).
Title: Fermi-Pasta-Ulam-Tsingou: When Paradox Turns into a Discovery

18/6/2018 **Invited talk - International Workshop on PDEs: Analysis and Modelling**,
University of Zagreb, Zagreb (Croatia).
Title: Dirac Operators with Coulomb Interaction

18/5/2018 **Contributed talk - Trieste Junior Quantum Days**,
Universitdi Trieste, Trieste (Italy).
Title: The touchy business of formal computations

13/4/2018 **Invited talk - Il problema di Fermi-Pasta-Ulam: stato dell'arte e prospettive**,
Scuola Galileiana, Padova (Italy).
Title: FPU and KdV hierarchy

19/2/2018 **Contributed talk - Mathematical Challenges in Quantum Mechanics**,
Università "La Sapienza", Rome (Italy).
Title: Self-adjoint realisations of the Dirac-Coulomb Operator

12/12/2017 **Seminar**,
Università degli Studi Milano Bicocca, Milano (Italy).
Title: Discrete spectra and self-adjointness for Critical Dirac-Coulomb

24/11/2017 **Seminar - Analysis Junior Seminars**,
SISSA, Trieste (Italy).
Title: Self-adjoint realisations of Dirac-Coulomb operators

24/5/2016 **Seminar - Analysis, MathPhys and Quantum**,
SISSA, Trieste (Italy).
Title: Self-adjoint realisations of the Dirac Operator with Coulomb interaction

12/5/2016 **Contributed talk - Junior Trieste Quantum Days**,
ICTP, Trieste (Italy).
Title: Self-adjoint reasliations of the Dirac-Coulomb Hamiltonian

25/4/2017 **Seminar**,
Università di Padova, Padova (Italy).
Title: A brief journey in Mathematical Physics

Conferences, Workshops and Schools

As invited speaker

9-13/7/2018 **Mathematical Challenges of zero range physics: rigorous results and open problems**,
INdAM headquarter, Rome (Italy).
Title of the contribution: Darwin-Like perturbations of the Hydrogen Spectra

17-20/6/2018 **International workshop on PDEs: Analysis and Modelling**,
University of Zagreb (Croatia).
Title of the contribution: Dirac operators with Coulomb Interaction

12-14/4/2018 **Il problema di Fermi-Pasta-Ulam: stato dell'arte e prospettive**,
Scuola Galileiana, Padova (Italy).
Title of the contribution: FPU and KdV Hierarchy

Participation

19-23/8/2019 **Quantissima in the Serenissima III**,
Palazzo Pesaro-Papfava, Venice (Italy).

24-26/7/2019 **Trieste Junior Quantum Days**,
ICTP, Trieste (Italy).

13-14/9/2018 **Matematica a misura della natura: due giornate di conversazioni scientifiche con Giancarlo**,
Department of Mathematics "T. Levi-Civita", Università degli Studi di Padova, Padova (Italy).

23-27/7/2018 **International Congress on Mathematical Physics**,
McGill University, Montreal (Canada).

20-21/7/2018 **Young Researchers Symposium**,
McGill University, Montreal (Canada).

11,18/5/2018 **Junior Trieste Quantum Days**,
Università degli Studi di Trieste, Trieste (Italy) .

6-10/5/2018 **Junior Math Days**,
SISSA, Trieste (Italy).

19-24/2/2018 **Mathematical Challenges in Quantum Mechanics**,
Università "La Sapienza", Rome (Italy).

29-30/1/2018 **Trails in Quantum Mechanics and Surroundings**,
SISSA, Trieste (Italy).

18-22/9/2017 **Insubria Summer School in Mathematical Physics. Spectral and scattering theory: from selfadjoint operators to boundary value problems**,
Università degli Studi dell'Insubria, Como (Italy).

12,19/5/2017 **Junior Trieste Quantum Days 2017**,
Università degli Studi di Trieste, Trieste (Italy) .

3-7/4/2017 **Spectral Days 2017**,
University of Stuttgart, Stuttgart (Germany).

30/3-1/4/2017 **Workshop on Macroscopic Limits of Quantum Systems**,
LMU University and TU University, München (Germany).

20-24/2/2017 **Trieste Quantum Days 2017**,
Università degli Studi di Trieste and ICTP, Trieste (Italy).

8-10/2/2017 **Linear and Nonlinear Dirac Equation: advances and open problems**,
Università degli Studi dell'Insubria, Como (Italy).

17-20/12/2016 **OTIND - Operator Theory and Indefinite Inner Product Spaces**,
TU University, Wien (Austria).

7-10/11/2016 **Mathematical Challenges of zero range physics: rigorous results and open problems**,
SISSA, Trieste (Italy).

11-15/7/2016 **Summer School: Universality, Scaling Limits and Effective Theories**,
Università "La Sapienza", Rome (Italy).

4-8/7/2016 **Contemporary Trends in the Mathematics of Quantum Mechanics**,
INdAM headquarter, Rome (Italy).

21-23/6/2016 **Trieste Quantum Days**,
SISSA, Trieste (Italy).

8-13/2/2016 **Mathematical Challenges in Quantum Mechanics**,
Bressanone (Italy).

Scientific visits

14-19/6/2019 **Universitat Politècnica de Catalunya, Barcelona (Spain)**,
Host: Stefano Pasquali.

13-17/5/2019 **Università degli Studi di Milano Bicocca**,
Host: Diego Noja.

11-12/12/2017 **Università degli Studi di Milano Bicocca**,
Host: Diego Noja.

20-22/11/2017 **Università degli Studi dell'Insubria**,
Hosts: Claudio Cacciapuoti and Andrea Posilicano.

4-8/7/2017 **Università degli Studi di Padova**,
Hosts: Giancarlo Benettin and Antonio Ponno.

4-10/12/2016 **Vrije Universiteit Amsterdam**,
Host: Bob Rink.

July 2015 **Vrije Universiteit Amsterdam**,
Host: Bob Rink.

Organisational Duties

Workshops

24-26/7/2019 Junior Quantum Days 2019

17-19/12/2018 Junior Math Days 2018

11,18/5/2018 Junior Quantum Days 2018

6-10/5/2018 Junior Math Days 2018

Cycles of Seminars

AY 2017-2018 Geometry and Mathematical Physics Student Seminars

AY 2016/2017 Analysis, Math-Phys and Quantum Seminars

Administrative experience

AY 2013-2015 Representative of Students in Department Council, Didactic Commission, Council of the Course of Studies for Physics at Università degli Studi di Padova

Supervised students

AY 2018/2019 **Internship - S. Baronio (University of Trieste)**,
Tutors: M.G. and Alberto Maspero
Project title: Mathematical aspects of symplectic algorithms.

AY 2018/2019 **Internship - V. Di Florio (University of Trieste)**,
Tutors: M.G. and Alberto Maspero
Project title: Basic algorithms for machine learning.

AY 2017/2018 **Bachelor thesis - M. Marian (University of Trieste)**,
Advisors: M.G. and Stefano Ruffo.
Date of dissertation: 15/03/2019

Teaching Experience

Spring 2015 **Introduzione alle equazioni differenziali alle derivate parziali**,
Department of Physics and Astronomy "Galileo Galilei", Università degli Studi di Padova, Padova (Italy).
Class: Undergraduate students in Physics and Astronomy - 8h

11-12/2014 **Mathematics high school teacher**,
Liceo Artistico Statale M. Guggenheim, Venice (Italy).
Class: 1st and 2nd year high school students

Computer skills

`C++` Intermediate knowledge: basics of object oriented programming, used mainly for numerical simulations

`Mathematica` Intermediate knowledge: used mainly for formal manipulations and plots

`Excel` Advanced knowledge: used mainly for data analysis and dynamical spreadsheets

`LaTeX` Intermediate knowledge: used mainly for writing and customisation of templates

`RStudio` Intermediate knowledge: used for statistical data analysis; good knowledge of packages for ecological data analysis

Affiliations

2016 - Gruppo Nazionale per la Fisica Matematica, Istituto di Alta Matematica (GNFM - INdAM)

Popularisation of Science

9/10/2020 **CICAP fest young**,
Online (due to COVID pandemic),
Title of the contribution: The silence of extinction.
I collaborated in the production of a 25 minutes video on the importance of biodiversity and ecosystem services. I collaborated with Francesca Zampieri both for video editing and text draft improvements.

3-4/9/2020 **A Basic sCience**,
Piazza Verdi, Trieste (Italy),
Title of the Activity: Relativity is not relative.
I wrote and recited a fifteen minutes monologue on Einstein's relativity principle. Project directed by Diana Höbel, see https://www.youtube.com/watch?v=IpSVUEa4XTI&feature=youtu.be for a short presentation video.

24/5/2019 **Science Picnic**,
ICTP, Trieste (Italy),
Title of the Activity: The mathematics of everyday life.
Interactive lecture for high school students. The lecture aims at showing how to model an everyday life problem and to get some useful information out of its mathematical modelisation. (Italian title: Matematizzare la realtà).

27/6/2018 **Fest@t 2018**,
Polo Giovani Toti, Trieste (Italy),
Title of the Activity: Pills of Science.
Theatral show on various scientific topics: from music and Kepler's laws to genetics and data economy. Written and recited by Federica Baldassarri, Emanuele Caputo, Riccardo De Filippis, Matteo Gallone, Costantino Pacilio and Gessica Racca in a project directed by Diana Höbel (Italian title: Pillole di Scienza).

Languages

Italian Mothertongue
English Proficient

Curriculum Vitae Europass

Informazioni personali

Cognome(i/)/Nome(i)	**Javarone Marco Alberto**		
Indirizzo(i)	—		
Telefono(i)	—	Mobile	——
E-mail	——		
Cittadinanza	Italiana		
Data di nascita	——		
Sesso	M		

Esperienza professionale

Date	Dal 01/07/2019 al 30/09/2020
Lavoro o posizione ricoperti	Lecturer in Applied Mathematics
Principali attività e responsabilità	Attività di ricerca e didattica
Nome e indirizzo del datore di lavoro	University College London (UCL), London, UK
Tipo di attività o settore	Università

Date	10/09/2018 - 15/03/2019
Lavoro o posizione ricoperti	Senior Lecturer in Statistical Physics
Principali attività e responsabilità	Attività di ricerca e didattica
Nome e indirizzo del datore di lavoro	Coventry University, Coventry, UK
Tipo di attività o settore	Università

Date	10/09/2018 - 09/09/2018
Lavoro o posizione ricoperti	Research Associate
Principali attività e responsabilità	Attività di ricerca
Nome e indirizzo del datore di lavoro	University of Kent, Chatam, UK
Tipo di attività o settore	Università

Date	Aprile 2018
Lavoro o posizione ricoperti	Visiting Lecturer
Principali attività e responsabilità	Attività didattica e scientifica
Nome e indirizzo del datore di lavoro	ITMO University, St Petersburg, Russia
Tipo di attività o settore	Università

Date	08/01/2018 - 22/12/2018
Lavoro o posizione ricoperti	Senior Researcher
Principali attività e responsabilità	Attività di ricerca su bitcoin networks e blockchain based technologies
Nome e indirizzo del datore di lavoro	nChain, London, UK
Tipo di attività o settore	Azienda

Date	03/04/2017 - 31/01/2018
Lavoro o posizione ricoperti	Senior Research Fellow
Principali attività e responsabilità	Attività di ricerca
Nome e indirizzo del datore di lavoro	University of Hertfordshire, Hatfield, UK
Tipo di attività o settore	Università

Date	01/10/2014 - 30/09/2015
Lavoro o posizione ricoperti	Assegno di ricerca
Principali attività e responsabilità	Attività di ricerca
Nome e indirizzo del datore di lavoro	Università di Sassari, Sassari, Italia
Tipo di attività o settore	Università

Date	19/05/2014 - 19/06/2014
Lavoro o posizione ricoperti	Invited Researcher
Principali attività e responsabilità	Attività di ricerca
Nome e indirizzo del datore di lavoro	Ecole Polytechnique de Paris, Paris, France
Tipo di attività o settore	Università

Date	16/07/2012 - 15/07/2014
Lavoro o posizione ricoperti	Assegno di ricerca
Principali attività e responsabilità	Attività di ricerca
Nome e indirizzo del datore di lavoro	Università di Sassari, Sassari, Italia
Tipo di attività o settore	Università

Date	AA 2016/2017 e AA 2017/2018
Lavoro o posizione ricoperti	Professore a Contratto
Principali attività e responsabilità	Attività didattica in Fisica
Nome e indirizzo del datore di lavoro	Università di Sassari, Sassari, Italia
Tipo di attività o settore	Università

Istruzione e formazione

Date	01/01/2014 - 31/12/2016
Titolo della qualifica rilasciata	Dottore di Ricerca in Matematica e Informatica. Indirizzo: Matematica, Valutazione: SUMMA CUM LAUDE
Principali tematiche/competenza professionali possedute	Attività di formazione alla ricerca e attività di ricerca in Fisica Matematica e Fisica Statistica dei sistemi complessi
Nome e tipo d'organizzazione erogatrice dell'istruzione e formazione	Università di Cagliari, Cagliari, Italia
Livello nella classificazione nazionale o internazionale	Scuola di Dottorato

Date	03/2010 - 02/2013
Titolo della qualifica rilasciata	Dottore di Ricerca in Ingegneria Elettronica e Informatica. Indirizzo: Sistemi di Elaborazione delle Informazioni, ING-INF/05. Valutazione: Eccellente
Principali tematiche/competenza professionali possedute	Attività di formazione alla ricerca e attività di ricerca in Reti Complesse e loro applicazione ai sistemi sociali
Nome e tipo d'organizzazione erogatrice dell'istruzione e formazione	Università di Cagliari, Cagliari, Italia
Livello nella classificazione nazionale o internazionale	Scuola di Dottorato

Capacità e competenze personali

Madrelingua **Italiano**

Altra(e) lingua(e) **Inglese e Francese**

Autovalutazione	Comprensione		Parlato		Scritto
Livello europeo (*)	Ascolto	Lettura	Interazione orale	Produzione orale	
Inglese	Ottimo	Ottimo	Ottimo	Ottimo	
Francese	Base	Buono	Base	Base	

(*) Quadro comune europeo di riferimento per le lingue

Capacità e competenze informatiche	Linguaggi di programmazione Python, C. Utilizzo database SQL, NOSQL, utilizzo API, tecniche di machine learning quali Neural Networks.
Patente	A,B

Elenco Pubblicazioni

Titolo, autori, journal/conferenza, anno	A mean field approach to model levels of consciousness from EEG recordings. Marco A. Javarone et al., Journal of Statistical Mechanics: Theory and Experiment, 083405, 2020
Titolo, autori, journal/conferenza, anno	Strategy equilibrium in dilemma games with off-diagonal payoff perturbations, M.A. Amaral and Marco A. Javarone, Physical Review E, 101(6), 2020
Titolo, autori, journal/conferenza, anno	Heterogeneity in evolutionary games: an analysis of the risk perception, M.A. Amaral and Marco A. Javarone, Proceedings of the Royal Society A 476 (2237), 20200116, 2020
Titolo, autori, journal/conferenza, anno	The Host-Pathogen Game: an evolutionary approach to biological competitions. Marco Alberto Javarone. Frontiers in Physics 6(94), 2018
Titolo, autori, journal/conferenza, anno	Heterogeneous update mechanisms in evolutionary games: mixing innovative and imitative dynamics. Marco A. Amaral and Marco Alberto Javarone. Physical Review E 97 2018
Titolo, autori, journal/conferenza, anno	Dilution of Ferromagnets via a Random Graph-based Strategy. Marco Alberto Javarone and Daniele Marinazzo. Complexity, 2845031, 2018
Titolo, autori, journal/conferenza, anno	From Bitcoin to Bitcoin Cash: a Network Analysis. MA Javarone and Craig S. Wright, ACM MobiSys, CryBlock2018 Munich Germany, 2018
Titolo, autori, journal/conferenza, anno	Evolutionary Dynamics of Group Formation. Marco Alberto Javarone and Daniele Marinazzo, PloS ONE 12(11) e0187960, 2017
Titolo, autori, journal/conferenza, anno	Solving Optimization Problems by the Public Goods Game. Marco Alberto Javarone EPJ-B 90:171, 2017
Titolo, autori, journal/conferenza, anno	The beneficial role of 'mobility' for the emergence of Innovation. Giuliano Armano and Marco Alberto Javarone. Scientific Reports (7) 1781, 2017
Titolo, autori, journal/conferenza, anno	A Statistical Physics Perspective to Understand Social Visual Attention in Autism Spectrum Disorder. Alessio Liberati, Roberta Fadda, Giuseppe Doneddu, Sara Congiu, Marco Alberto Javarone, Tricia Striano and Alessandro Chessa. Perception, doi:10.1177/0301006616685976, Perception 2017
Titolo, autori, journal/conferenza, anno	Modeling Poker Challenges by Evolutionary Game Theory. Marco Alberto Javarone, 7(4) 39, Games, 2016
Titolo, autori, journal/conferenza, anno	An Evolutionary Strategy based on Partial Imitation for Solving Optimization Problems. M.A. Javarone, Physica A: Statistical Mechanics and Its Applications 463, 2016
Titolo, autori, journal/conferenza, anno	The Role of Noise in the Spatial Public Goods Game. MA Javarone and F Battiston. Journal of Statistical Mechanics: Theory and Experiment P073404 2016
Titolo, autori, journal/conferenza, anno	Conformity-driven agents support ordered phases in the spatial Public Goods Game. MA Javarone, AA and F Caravelli EPL 114(3) 38001, 2016

Titolo, autori, journal/conferenza, anno	Modeling Radicalization Phenomena in Heterogeneous Populations. S Galam and MA Javarone. PloS ONE 11(5): e0155407 2016
Titolo, autori, journal/conferenza, anno	Statistical Physics of the Spatial Prisoner's Dilemma with Memory-aware Agents. MA Javarone. European Physical Journal B (89:2) 2 2016
Titolo, autori, journal/conferenza, anno	Modeling Evolutionary Dynamics of Lurking in Social Networks. Marco Alberto Javarone, Roberto Interdonato, Andrea Tagarelli, CompleNet16 Springer-Verlag Studies in Computational Intelligence 2016
Titolo, autori, journal/conferenza, anno	Emerging Heterogeneities in Italian Customs and Comparison with Nearby Countries. E Agliari, A Barra, A Galluzzi, M A Javarone, A Pizzoferrato, D Tantari. PloS ONE 10(12): e0144643 2015
Titolo, autori, journal/conferenza, anno	Conformism-driven phases of opinion formation on heterogeneous networks: The q-voter model case. MA Javarone and T Squartini, Journal of Statistical Mechanics: Theory and Experiment, P10002, 2015
Titolo, autori, journal/conferenza, anno	The Role of Competitiveness in the Prisoner's Dilemma. MA Javarone and A E Atzeni. Computational Social Networks (2) 2015
Titolo, autori, journal/conferenza, anno	Fermionic Networks: Modeling Adaptive Complex Networks with Fermionic Gases. MA Javarone. International Journal of Modern Physics – C, 2015
Titolo, autori, journal/conferenza, anno	Is Poker a Skill Game? New Insights from Statistical Physics. MA Javarone. EuroPhysics Letters (EPL), 110 – 58003, 2015
Titolo, autori, journal/conferenza, anno	Poker as a Skill Game: Rational vs Irrational Behaviors. MA Javarone. Journal of Statistical Mechanics: Theory and Experiment, P03018, 2015
Titolo, autori, journal/conferenza, anno	Gaussian networks generated by random walks. MA Javarone. Journal of Statistical Physics, 159-1, 2015
Titolo, autori, journal/conferenza, anno	Emergence of Extreme Opinions in Social Networks. MA Javarone and S Galam. CrimeNet – SociInfo2014 Barcelona Springer, 8852, 2015
Titolo, autori, journal/conferenza, anno	Social Influences in Opinion Dynamics: the Role of Conformity. MA Javarone. Physica A: Statistical Mechanics and Its Applications – volume 414, 2014
Titolo, autori, journal/conferenza, anno	The Role of the Shannon Entropy in the identification of acronyms. M A Javarone. Studies in Computational Intelligence Volume 549. CompleNet14 Bologna March, Springer, 2014
Titolo, autori, journal/conferenza, anno	Network Strategies in the Election Campaigns. Marco Alberto Javarone. Journal of Statistical Mechanics: Theory and Experiment – volume 2014 – P08013, 2014
Titolo, autori, journal/conferenza, anno	Competitive dynamics of lexical innovations in multi-layer networks. MA Javarone. International Journal of Modern Physics C. DOI: 10.1142/S012918311450048X, 2014
Titolo, autori, journal/conferenza, anno	Emergence of acronyms in a community of language users. MA Javarone and G Armano. European Physical Journal – B. 86:474, 2013

Titolo, autori, journal/conferenza, anno	Perception of similarity: a model for social networks dynamics. MA Javarone and G Armano. Journal of Physics A: Mathematical and Theoretical. 46-455102, 2013
Titolo, autori, journal/conferenza, anno	Quantum-classical transitions in complex networks. Marco Alberto Javarone and Giuliano Armano. Journal of Statistical Mechanics: Theory and Experiment. P04019, 2013
Titolo, autori, journal/conferenza, anno	P Clustering Datasets by complex networks analysis. G Armano and MA Javarone. Complex Adaptive Systems Modeling 1:5, 2013
Titolo, autori, journal/conferenza, anno	Phase Transitions in Fermionic Networks. MA Javarone and G Armano. 11th International Conference on Adaptive and Natural Computing Algorithms (ICANNGA13), LNCS Springer, 2013
Titolo, autori, journal/conferenza, anno	A Fitness Model for Epidemic Dynamics in Complex Networks. MA Javarone and G Armano. The 8th International Conference on Signal Image Technology and Internet Based Systems (SITIS2012) - IEEE Workshop on Complex Networks and Their Applications, 2012

Libri e Capitoli su Libri

Titolo, autori, Editore, anno	Statistical Physics and Computational Methods for Evolutionary Game Theory. MA Javarone, Springer, 2018
Titolo, autori,Editore, anno	Complex Networks and Epidemiology. MA Javarone and G Armano. Complex Networks and Their Applications – Chapter 8. Cambridge Scholars Publishing. 2014

Tesi di Dottorato

Titolo, autori,Editore, anno	Statistical Physics of Evolutionary Game Theory and its Applications. MA Javarone. Supervisori: Prof. Salvatore Mignemi and Prof. Adriano Barra, Cagliari 2017. Tesi di dottorato in Matematica
Titolo, autori,Editore, anno	Models and Frameworks for Studying Social Behaviors. MA Javarone. Supervisori: Prof.Giuliano Armano. Cagliari 2013. Tesi di dottorato in Ingegneria Informatica

Presentazioni presso conferenze

Titolo, autori, conferenza, anno	Emerging Patterns in the Bitcoin Network. BlockNet2018, Paris, June 2018
Titolo, autori, conferenza, anno	From Bitcoin to Bitcoin Cash: a Network analysis. CryBlock2018, Munich, June 2018
Titolo, autori, conferenza, anno	Uncovering the Dynamics of Consciousness on Multiplex Networks: a preliminary analysis. Network Neuroscience, Paris, June 2018
Titolo, autori, conferenza, anno	Investigating consciousness and its disorders by network analysis. Data Natives, London 2018

Titolo, autori, conferenza, anno	Tutorial: Evolutionary Game Theory: Models and Applications. European Conference on Artificial Life 2017, Lyon (France), 2017
Titolo, autori, conferenza, anno	An Evolutionary Game for Modeling the Emergence of Innovation in Social Systems. Dubrovnik (Croatia), 2017
Titolo, autori, conferenza, anno	Poker Games on Complex Networks. International Workshop on Complex Systems and their Applications. Milano, 2016
Titolo, autori, conferenza, anno	The Public Goods Game as Heuristic for Solving Optimization Tasks. CCS16, Amsterdam, Sept. 2016
Titolo, autori, conferenza, anno	Conformity-driven agents support ordered phases in the spatial public goods game. CCS16, Amsterdam, Sept. 2016
Titolo, autori, conferenza, anno	Skill games versus gambling: from Poker to financial markets. An old debate faced by Statistical Physics. Satellite co-located at CCS16 Computational Social Science: Social Contagion, Collective Behaviour, and Networks Amsterdam, Sept. 2016
Titolo, autori, conferenza, anno	***Invited tutorial.*** Social Behaviors through Networks: Models and Applications. International Workshop on Knowledge Discovery on the Web - KDWeb2016. Cagliari, 8-10 Sept. 2016
Titolo, autori, conferenza, anno	Statistical Physics of Evolutionary Games: from the emergence of cooperation to optimization problems. STATPHYS26, Lion France, July 2016
Titolo, autori, conferenza, anno	A mean field approach to the emergence of cooperation in evolutionary games. Econophysics Colloquium 15, Prague, September 2015
Titolo, autori, conferenza, anno	Is Poker a skill game? IC2S2 – International Conference on Computational Social Science, Helsinki, June 2015
Titolo, autori, conferenza, anno	Modeling Group Polarization in Terrorism Dynamics. IC2S2 – International Conference on Computational Social Science, Helsinki, June 2015
Titolo, autori, conferenza, anno	***Keynote Speaker*** Opinion Dynamics in Criminal Contexts. NetCrime 2015, co-located at NetSci 2015, Saragoza (Spain), June 2015
Titolo, autori, conferenza, anno	***Invited-talk*** Poker Challenges: a sociophysical perspective. Workshop on Sociophysics. 30-31 March 2015 (Paris - France)
Titolo, autori, conferenza, anno	Emergence of Cooperation in Competitive Environments. Signal-Image Technology and Internet-Based Systems (SITIS) 2014 IEEE – Complex Networks 2014 (Marrakech – Morocco), 2014
Titolo, autori, conferenza, anno	Emergence of Extreme Opinions in Social Networks. CrimeNet – SociInfo2014 – Barcelona
Titolo, autori, conferenza, anno	Poker as a Skill Game: Rational vs Irrational Behaviors. Lucca-ECCS14
Titolo, autori, conferenza, anno	Conformism-driven phase transition on heterogeneous networks: the q-voter model case. Lucca-ECCS14, 2014
Titolo, autori, conferenza, anno	The Role of the Shannon Entropy in the identification of acronyms. CompleNet14 Bologna March (Springer), 2014

Titolo, autori, conferenza, anno	The Acronyms Game, ECCS13 - Satellite 'CSS: from Social Contagion to Collective Behavior'. Barcelona 2013
Titolo, autori, conferenza, anno	Phase Transitions in Fermionic Networks, 11th International Conference on Adaptive and Natural Computing Algorithms (ICANNGA13), 2013
Titolo, autori, conferenza, anno	A Fitness Model for Epidemic Dynamics in Complex Networks, The 8th International Conference on Signal Image Technology and Internet Based Systems (SITIS2012) - IEEE Workshop on Complex Networks and Their Applications, 2012

Attività didattica

Corso, Università, Anno Accademico	Lecturer - Operational Research, UCL, London, 2019/2020
Corso, Università, Anno Accademico	Tutor - Applied Mathematics, UCL, London, 2019/2020
Corso, Università, Anno Accademico	Lecturer - Mathematics for theoretical physics and mathematical analysis. Coventry University, Coventry, UK, 2018/2019
Corso, Università, Anno Accademico	Tutor - Applied Mathematics 1 and Applied Mathematics 2. Coventry University, Coventry, UK, 2018/2019
Corso, Università, Anno Accademico	Visiting Lecturer at ITMO University teaching Mathematical and Computational Models for Complex Systems, St Petersburg, Russia, Aprile 2018
Corso, Università, Anno Accademico	Adjunct Professor of Physics at University of Sassari, 2017/2018
Corso, Università, Anno Accademico	**Invited seminar.** Evolutionary Game Theory: a brief introduction. International Summer School: Mediterranean School of Complex Networks. Salina, Sicily (Italy), 06/09/2017
Corso, Università, Anno Accademico	Adjunct Professor of Physics at University of Sassari, 2016/2017
Corso, Università, Anno Accademico	Tutor in Analytical Mechanics, Università di Cagliari, 2016/2017
Corso, Università, Anno Accademico	Tutor in Analytical Mechanics, Università di Cagliari, 2015/2016
Corso, Università, Anno Accademico	Adjunct Professor of Computer Science at University of Sassari, 2014/2015
Corso, Università, Anno Accademico	Adjunct Professor of Computer Science at University of Sassari, 2013/2014
Corso, Università, Anno Accademico	Adjunct Professor of Computer Science at University of Sassari, 2011/2012
Corso, Università, Anno Accademico	Adjunct Professor of Computer Science at University of Sassari, 2010/2011

Supervisione Tesi

MS Degree Theoretical Physics. University of Cagliari. Student: omesso. Agent-based Models in Game Theory: Cooperation as an Emergent Phenomenon. Advisor: Prof. P. Olla (co-supervisor), 2014

BA Tourism Sciences. University of Sassari. Student: omesso. Marketing and Social Networks: an analysis on human factors that influence decisions. Advisor: Prof. B. Pinna, 2014

Supervisore di 2 summer project presso UCL, London, per MSc Mathematical Modeling (nomi studenti omessi)

(1) Understanding cooperation: analysing human behaviours by mathematical models

(2) Modelling emergent phenomena in the human brain

Supervisore di 5 summer project presso UCL, London, per MSc Financial Mathematics

(1) Cybersecurity and fraudulent behaviours in Blockchain based systems

(2) Cryptographic protocols in blockchain based technologies

(3) Econophysics models for studying financial markets

(4) The evolution of financial markets with the advent of blockchain based technologies and cryptocurrencies.

(5) Modelling the dynamics of cryptocurrencies

Attività Editoriale

Elenco riviste

Scientific Reports – Nature, Reviewer; Proceedings of the Royal Society, Reviewer; Physical Review (APS), Reviewer; Social Network Analysis and Mining (SNAM), Reviewer; Europhysics Letters, Reviewer; Entropy, Reviewer and Topic Board; EPJ Data Science, Reviewer; EPJ-B Reviewer; PlosOne, Reviewer; Games, Reviewer; Physica A: Statistical Mechanics and its Applications, Reviewer; Journal of Statistical Mechanics: Theory and Experiment (JSTAT), Reviewer; Applied Network Science, Reviewer; Journal of. Physics: Complexity; Physics Letters A, Reviewer; Frontiers in Physics, Reviewer; Modern Physics Letters B, Reviewer; Frontiers in ICT – Quantum Computing, Review Editor; Frontiers in Human Neuroscience, Reviewer; Casmodeling – SpringerOpen Journal, Reviewer; Sensors mdpi, Reviewer; Int Journal of Research and Public Health, Reviewer; Frontiers in Psychology; Reviewer.

Sassari, 02/12/2020

Marco Alberto Javarone

Stefano Marchesani

November 4, 2020

Born in:

Education

2013–2017	DPhil in Mathematics, University of Oxford - OxPDE Group.
2011–2013	Master's degree in Theoretical Physics (110 cum Laude), Università di Roma Tor Vergata.
2008–2011	Bachelor's degree in Physics (110 cum Laude), Università di Roma Tor Vergata.

Languages

Italian	Native speaker
English	**TOEFL: score 105/120**
French	Good

Research Area

My research focuses on hydrodynamic limits of Hamiltonian systems inspired by physical models. In particular I am interested in finding solutions to systems of nonlinear hyperbolic PDEs in shock regime from a microscopic point of view. This not only provides a method to obtain existence of solutions for systems of PDEs, but is also used to study the Physics of macroscopic systems, with particular emphasis on their Thermodynamics.

List of Publication

- Published Articles

  (1) S Marchesani and S Olla *On the existence of L^2-valued thermodynamic entropy solutions for a hyperbolic system with boundary conditions*, Communications in Partial Differential Equations, DOI: 10.1080/03605302.2020.1750426, 2020

  (2) L Alasio and S Marchesani *Global existence for a class of viscous systems of conservation laws*, Nonlinear Differ. Equ. Appl. 26:32. https://doi.org/10.1007/s00030-019-0577-3, 2019

(3) S Marchesani and S Olla *Hydrodynamic Limit for an Anharmonic Chain Under Boundary Tension*, Nonlinearity, 31(11):4979, 2018

- Accepted Articles

(1) S Marchesani *Hydrodynamic limit for a diffusive system with boundary conditions*, To appear on ALEA, 2020

- Preprints

(1) S Marchesani and S Olla *Hydrodynamics Limits and Clausius inequality for Isothermal Nonlinear Elastodynamics with Boundary Tension*, https://arxiv.org/abs/1911.13167, 2020

Professional Experience

2018-Present	**Postdoc in Mathematics** Gran Sasso Science Institute, L'Aquila
2020	**Tutorship, Università dell'Aquila** Subject taught: Analisi II
2017-2018	**High School Teacher of Mathematics, Physics and Computer Science** Complesso Scolastico Seraphicum and Istituto San Gabriele, Rome
2016-2017	**College Lecturer, University of Oxford** During the Academic Year 2016/2017 I worked as College Lecturer for Worcester College. The subjects I taught were first year Linear Algebra, Analysis and Integration.
2016	**Teaching Assistant, University of Oxford** In Hilary term 2016 I worked as a Teaching Assistant for B4.2 Hilbert Spaces under the supervision of Richard Earl.
2015	**Class Tutor, University of Oxford** In Michaelmas term 2015 I worked as a Class Tutor for the graduate PDE CDT course Measure Theory and Probability.
2015	**Class Tutor, University of Oxford** In Michaelmas term 2015 I worked as a Class Tutor for C5.3 Statistical Mechanics, under the supervision of Andrew Fowler.
2015	**Teaching Assistant, University of Oxford** In Michaelmas term 2015 I worked as a Teaching Assistant for C7.2 Electromagnetism, under the supervision of Luis Fernando Alday, Pietro Benetti Genolini and Mathew Bullimore.
2015	**Class Tutor, University of Oxford** In Hilary term 2015 I worked as a Class Tutor for B7.1 Classical Mechanics, under the supervision of James Sparks.
2014	**Organising Prof. Chen's Nonlinear PDE seminars** Michaelmas term 2014.
2014	**Teaching Assistant, University of Oxford.** In Michaelmas term 2014 I worked as a Teaching Assistants for C7.2 Electromagnetism, under the supervision of Luis Fernando Alday and Agnese Bissi.
2014	**Short Course on Stochastic Dynamics** From the 28th June to the 2nd of July I attended the *Short Course in Stochastic Dynamics, Filtering and Rare Events* at the University of Warwick.
2014	**Teaching Assistant, University of Oxford.** In Hilary term 2014 I worked as Teaching Assistant for C7.6 General Relativity II, under the supervision of Xenia de la Ossa and Micheal Enciso.
2013	**Association to the Tor Vergata INFN (Italian National Institute of Nuclear Physics) Section.**

2013 **Tutorship, Università di Roma Tor Vergata.**
In the second semester of the Academic year 2012/2013 I worked as a tutor for the Mathematics Master course *Analisi di Fourier - modulo 2* (Fourier Series, Fourier Transform, Tempered Distributions and DFT/FFT algorithms), under the supervision of Massimo Picardello.

2013 **Summer school, University of Crete.**
During the month of April I attended the summer school *Non Perturbative Quantum Field Theories*, organised by Elias Kiritsis and Vasilis Niarchos in the University of Crete.

2012 **Tutorship, Università di Roma Tor Vergata.**
In the second semester of the Academic year 2011/2012 I worked as a tutor for the Physics Bachelor courses *Fisica 2* (Electromagnetism and Special Relativity) and *Fisica 3* (Waves and Optics), under the supervision of Pietro Chiaradia.

Licences and Certifications

→ **IBM Data Science Professional Certificate** - IBM (issued by Coursera on April 2020).
Completed courses:

1. What is Data Science?
2. Tools for Data Science
3. Data Science Methodology
4. Python for Data Science and AI
5. Databases and SQL for Data Science
6. Data Analysis with Python
7. Data Visualization with Python
8. Machine Learning with Python
9. Applied Data Science Capstone

→ **Machine Learning** - Stanford University (issued by Coursera on March 2020).

Fruther Skills

→ **Coding and softwares:**

- I am able to program in LaTeX, *C*, *C++* , *C#*, Python, *R*, *MATLAB* and *Mathematica*.
- I am able to write apps for iOS and MacOS machines using XCode (coding in Swift 3) and I am currently working on writing Android apps using Android Studio (coding in Java and XML).
- I am also proficient in using Word, Excel, Power Point and their MacOS equivalents.

→ **Music:**
I am an amateur musician: I have been playing classical piano for twelve years and I have been studying lyrical and modern sing for eight.

Other Experiences

2013–2015 **Oxford Musical Theatre Society.** President in 2015. Member since Michaelmas term 2013.

VINCENZO MORINELLI | CV

Office: Mathematics Department, "Tor Vergata" University of Rome, via della Ricerca Scientifica, 1 - I-00133 Rome, Italy.

Employment history

Mar '21-Aug 22	**Postdoctoral Researcher**	FAU Erlangen-Nürnberg

- Alexander von Humboldt Foundation postdoctoral fellowship for Experienced Researchers at the Mathematics Department of the Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany).

Mar '20-Feb '21	**Postdoctoral Researcher**	"Tor Vergata" Univ. of Rome

- postdoc for the Roberto Longo ERC advanced grant "Quantum Algebraic Structures and Models".

Mar '19-Feb '20	**Postdoctoral Researcher**	INdAM (Istituto Nazionale di Alta Matematica)

- collaboration postdoc fellowship provided by INdAM, the National Institute for High Mathematics. My research project "Operator algebraic aspects of Quantum Field Theory is 2^{nd} ranked on the call. Host Institution: "Tor Vergata" Univ. of Rome

Mar 16-Feb '19	**Postdoctoral Researcher**	"Tor Vergata" Univ. of Rome

- postdoc for the Roberto Longo ERC advanced grant "Quantum Algebraic Structures and Models"; from 01/03/2018 supported by the program MIUR FARE R16X5RB55W.

Education

Dec 15th,2015	**Ph.D. in Mathematics**	"Tor Vergata" Univ. of Rome

- **Thesis:** "On the Bisognano-Wichmann Property, Nuclearity and Particle Localization", Advisor: Prof. Roberto Longo.

Jul 18th,2012	**Master's degree in Mathematics**	"Roma Tre" Univ. of Rome

- Final Mark:110/110 cum Laude
- **Thesis:** "The Semilinear Klein-Gordon Equation in two and three space dimensions", Advisor: Prof. Giovanni Mancini.

Jul 15th, 2010	**Bachelor's degree in Mathematics**	"Roma Tre" Univ. of Rome

- Final Mark:110/110 cum Laude

Fields of interests

My **research interests** concern *Functional Analysis*, *Operator Algebras* and its applications to *Relativistic Quantum* systems with infinitely many degrees of freedom. My research centrally involves further topics as *Operator Theory*, *(compact and locally compact) Group Representation Theory*, Lie algebra/group theory, *Lattice scaling limit*, Entropy theory, Subfactor theory. *Partial differential equations*, in particular elliptic and hyperbolic equations, are also part of my background (referring to undergraduate studies, cf. master thesis)..

I am also interested in **science communication** (see additional information section).

Scientific Contributions:

My research concerns the relation between geometric and algebraic properties in the operator algebraic approach to QFT. The Haag-Kastler axioms describe (continuum) infinite degrees of freedom systems respecting basic quantum and relativistic assumptions. In brief, models are defined axiomatically by algebras of bounded operators (observables) on an infinite dimensional Hilbert space, associated to regions of the spacetime (Minkowski, S^1-chirality) undergoing a covariant action of the symmetry group (Poincaré, Möbius, Diffeomorfisms...). They further commute when they are spacelike separated (locality).

My scientific contributions:

- Solution of a long standing problem on infinite spin representations localization property (Publication 1)
  We study the (non-)dilation covariance property of infinite spin Poincaré representations to conclude the absence of local algebras
  with R. Longo (Univ. Tor Vergata) and K.-H. Rehren (Univ. Göttingen)

- An algebraic sufficient condition for the Bisognano-Wichmann property (Publications 2 and 4)
  I introduce new algebraic condition on the Poincaré covariant representation that ensures an identification of algebraic and geometric objects/symmetries.

- Split Property for conformal field theories (Publication 3)
  We prove the existence of a product state (statistical independence = Split property) on positively separated local von Neumann algebras of a local conformal (diffeomorphism covariant) net on the circle. Counterexamples in 1+1 dimensional MInkowski space-time are also discussed.
  with Y. Tanimoto (Univ. Tor Vergata) and M. Weiner (BME).

- Dilation covariance imply Möbius covariance in 1+1 spacetime dimension (Publication 5)
  Algebraic structure of von Neumann algebra (Tomita operators) allows a larger symmetry group: from Poincaré and Dilation to conformal (Möbius) symmetries
  with Y. Tanimoto (Univ. Tor Vergata)

- Split Property for free massless finite helicity fields (Publication 6)
  The existence of conformal subtheories ensures the existence of product states (statistical independence) for positive-spacelike separated local von Neumann algebras
  with R. Longo (Univ. Tor Vergata), F. Preta (NYU), K.-H. Rehren(Univ. Göttingen)

- Bisognano-Wichmann property in massless interacting theory (Publication 7)
  Identification of geometric and algebraic objects is proven for general QFT (possibly interacting); breakthrough technique based on Publication 4.
  with W.Dybaslki (TU München)

- New algebraic constructions in QFT (Publication 8, Preprint 3)
  - New constructions and new relations between Poincaré representations and free QFT are provided by deforming Lie generators (Publication 8)
  with K.-H. Rehren (Univ. Göttingen)

  - Algebraic construction of new models provided through Lie theory techniques. (Preprint 3)
  with K.-H. Neeb (FA University Erlangen-Nürnberg)

- Scaling limit and operator-algebraic renormalization procedure (preprints 1 and 2.)
  We provide a rigorous operator algebraic procedure for the lattice scaling limit to the continuum which applies to the free field. A central role in the lattice approximation is covered by wavelets and scaling functions
  with G. Morsella (Univ. Tor Vergata), A. Stottmeister (Univ. Hannover), Y. Tanimoto(Univ. Tor Vergata)

Ongoing projects topics:

- Algebraic sufficient condition for the Bisognano-Wichmann property, Modular covariance in Quantum Field Theory.

- Nuclearity and compactness conditions on superselection sectors, namely for the representation theory of chiral theories.

- Modular covariance on Lie group and for general interacting theories
  in part with K.-H.Neeb (Univ. Erlangen-Nürnberg)and W. Dybalski (TU Münich)

- Scaling limit on lattice Quantum field theory
  with A. Stottmeister (Univ. Hannover), Gerardo Morsella and Yoh Tanimoto (Univ. Tor Vergata)

- Entropy and Tomita modular theory in QFT
  in part with with R. Longo (Univ. Tor Vergata) and G. Lechner (Univ. Cardiff)

Publications:

Published:

1. R. Longo, V. Morinelli, K.-H. Rehren, *Where Infinite Spin Particles Are Localizable*, Commun. in Math. Phys., Volume 345, Issue 2, pp 587–614 (2016). https://doi.org/10.1007/s00220-015-2475-9
2. V. Morinelli, *An algebraic condition for the Bisognano-Wichmann Property*, Proceedings of the 14th Marcel Grossmann Meeting - MG14, Rome pp. 3849-3854 (2017) https://doi.org/10.1142/9789813226609_0509
3. V. Morinelli, Y. Tanimoto, M. Weiner, *Conformal covariance and the split property* Commun. Math. Phys. Volume 357, Issue 1, pp 379–406 (2018). https://doi.org/10.1007/s00220-017-2961-3
4. V. Morinelli, *The Bisognano-Wichmann property on nets of standard subspaces, some sufficient conditions*, Ann. Henri Poincaré, Volume 19, Issue 3, 937–958 (2018). https://doi.org/10.1007/s00023-017-0636-4
5. V. Morinelli, Y. Tanimoto, *Scale and Möbius covariance in two-dimensional Haag-Kastler net*, Commun. in Math. Phys. Vol 371, Issue 2, pp 619–650 (2019) https://doi.org/10.1007/s00220-019-03410-x
6. R. Longo, V. Morinelli, F. Preta, K.-H. Rehren, *Split property for free finite helicity fields*, Ann. Henri Poincaré, Volume 20, Issue 8, pp 2555-2258 (2019). https://doi.org/10.1007/s00023-019-00820-4
7. W. Dybalski, V. Morinelli, *Bisognano-Wichmann property for asymptotically complete massless QFT*, Commun. in Math. Phys. 380, 1267–1294 (2020) https://doi.org/10.1007/s00220-020-03755-8
8. V. Morinelli, K.-H. Rehren, *Spacelike deformations: Higher-helicity fields from scalar fields*, Lett. in Math. Phys., 110, 2019-2038 (2020) https://doi.org/10.1007/s11005-020-01294-w

Preprint:

1. A. Stottmeister, V. Morinelli, G. Morsella, Y. Tanimoto, *Operator-algebraic renormalization and wavelets*, arXiv:2002.01442[1] (2020) (submitted to a scientific journal). https://arxiv.org/abs/arXiv:2002.01442
2. V. Morinelli, G. Morsella, A. Stottmeister, Y. Tanimoto, Scaling limits of lattice quantum fields by wavelets, arXiv:2010.11121 (2020) (submitted to a scientific journal). https://arxiv.org/pdf/2010.11121.pdf
3. V. Morinelli, and K.-H. Neeb, Covariant homogeneous nets of standard subspaces , arXiv:2010.07128 (2020) (submitted to a scientific journal) https://arxiv.org/pdf/2010.07128.pdf

In preparation

1. V. Morinelli, Y. Tanimoto, B. Wegener, "Modular operator for null plane algebras in free fields"

Student supervision

Here is a list of M.Sc and Ph.D. Students to whose supervision I gave a contribution:

- Benedikt Wegener, (INdAM Cofund, Univ. Roma Tor Vergata, Advisor: Prof Roberto Longo), **Ph. D. Student**, Ongoing.
  Joint paper in preparation.
- Francesco Preta, (Univ. Roma Tor Vergata, Advisor: Prof. Roberto Longo), **M. sc.** 2015.
  Joint paper on Annales Henri Poincaré (Publication 6). He is currently Ph.D. student at New York University (NYU), Courant Institute of Mathematical Sciences.
- Francesco Bonesi (Univ. Roma Tor Vergata, Advisor: Prof. Roberto Longo), **M.Sc.** 2014 (unofficially), Stefania Romani (Univ. Roma Tor Vergata, Advisor: Prof.Gerardo Morsella), **M.Sc.** 2013 (unofficially)

[1] the contribution of the authors have to be considered equal. Alexander Stottmeister is the corresponding author.

Involvement in funding research projects:

- June 15th, 2016 - December 15th, 2017: participating in the research project: Ricerca Scientifica di Ateneo, Consolidate the Foundations - *Operator Algebraic Structures in Noncommutative Geometry.*
- December 1st, 2019 - June 1st, 2021: participating in the research project: Ricerca Scientifica di Ateneo, Beyond Borders - *Interaction of Operator Algebras with Quantum Physics and Noncommutative Structure*

Services

- **Referee** for Communication in Mathematical Physics, Annales Henri Poincaré, Nuclear Physics B.
- **Reviewer** for Mathematical Reviews of AMS.

Organization of international conferences

- 43rd LQP workshop "Foundations and Constructive aspects of QFT" Galileo Galilei Institute Firenze (Italy) February 20-22 , 2019.
  Webpage: https://sites.google.com/view/43-lqp

Some special events I took part:

1. May 2-8, 2014, spring school: *"NCGOA Spring Institute 2014, Subfactors, CFT and VoA"*, Department of Mathematics, **Vanderbilt University, Nashville, Tennessee, USA.**
2. March, 22-28, 2015, workshop: *"Subfactors and Conformal Field Theory"*, **Oberwolfach**, Germany.
3. July 12-18, 2015 **"14th Marcel Grossmann Meeting"** Rome, Italy.
   Invited talk: "Where Infinite Spin Particles Are Localizable" ("QF3 - Operator Algebras and Quantum Field Theory" session)
4. February 8-14, 2017, "Operator Algebras: Subfactors and their Applications" programme, Isaac Newton Institute, **Cambridge**, UK.
   Invited talk: "Conformal covariance and the split property".
   http://www.newton.ac.uk/seminar/20170209140015002
5. June, 17-22, 2019, Participation to the program at **the Simons Center for Geometry and Physics** *Program: Operator Algebras and Quantum Physics*, State University of **New York, Stony Brook (USA)**.
   Invited talk: Scale and Möbius covariance in two-dimensional Haag-Kastler net.
   http://scgp.stonybrook.edu/video_portal/video.php?id=4176
6. July 10, 2020, **Colloquium** "Mathematical Physics Regensburg-Munich", LMU and TU Munich.
   Invited talk:" Covariant homogeneous nets of standard subspaces".
7. November, 18, 2020 Tokyo-Kyoto Joint Online Operator Algebra Seminars, University of Tokyo, Japan.
   Invited talk:" Covariant homogeneous nets of standard subspaces".

Next events I will join to

- August 17th-21st, 2020, International Workshop on Operator Theory and its Applications, Lancaster (UK).
  Invited talk at special session on "Quantum groups and algebraic quantum field theory" Postponed for COVID pandemic to 2021

Some events I took part:

Past events:

1. December 17-19, 2012, workshop: *"NGAP - Noncommutative geometry and application to physics"* Milan, Italy.
2. January 29-February 2, 2013, workshop: *"Trails in quantum mechanics and surroundings"* Frascati, Italy.
3. June 17-28, 2013, summer school: *"Rigiditè et actions de groupes"* at Institut Mathèmatiques de Jussieu, at Paris Diderot University, Paris, France.

4. July 8-12, 2013 workshop: *"Mathematics and Quantum Physics"* Accademia dei Lincei, Rome, Italy.
5. September 1-8, 2013, workshop: *"Noncommutative Geometry and Applications"* organized by Stoilow Institute of Mathematics of the Romanian Academy, Poiana Brasov, Romany.
6. November 14-16, 2013, workshop: 33rd Workshop *"Foundations and Constructive Aspects of QFT"*, Göttingen, Germany,
7. June 16-21, 2014, workshop: *"Noncommutative Geometry and Applications"*; Villa Mondragone, Frascati, Italy.
8. February 11-13, 2015, workshop: *"New trends in algebraic quantum field theory"*, LNF-INFN, Frascati, Italy
9. April 20-24, 2015, conference: *"Advances in Noncommutative Geometry"*, Paris, France;
   Invited talk: "The Bisognano-Wichmann Theorem and Particle Localization"
10. May 29-30, 2015, workshop: *"36th, Local Quantum Physics"*, Leipzig, Germany.
    Title of the talk: "On Localization of Infinite Spin Particles"
11. May 17-25, 2016, "*NCGOA Spring Institute 2016*", Bonn, Germany.
12. June 23, 2016, *"Ph.D. Colloquium"*, Uni. Tor Vergata, Rome, Italy.
    Invited talk: "Particle Localization and Infinite Spin"
13. December 20, 2016, *"Department's day"*, Uni. Tor Vergata, Rome, Italy.
    Invited talk: "Conformal covariance and the split property".
14. June 6-September 30, 2016, "*Intensive trimester Mathematics and Physics at the Crossroads*" LNF, Frascati and INdAM, Rome, Italy.
15. Februry 26- March 3, 2017, workshop: *"Noncommutative Geometry and Applications"*, ICTP - Trieste, Italy.
    Invited talk: "Conformal covariance and the split property".
16. June 23-24, 2017, *LQP 40 Foundations and Constructive Aspects of Quantum Field Theory*, Max-Planck institute for Mathematics in the Sciences, Leipzig (Germany).
17. September 19-22, 2017, "Advances in Mathematics and Theoretical Physics" accademia dei Lincei, Rome.
18. December 8-10, 2017, workshop "Quantum Physics meets Mathematics", Hamburg, Germany.
19. February 2-3, 2018, workshop: *"41st, Local Quantum Physics"*, Leipzig, Germany.
    Title of the talk: "A sufficient condition for the Bisognano-Wichmann property"
20. February 15-16, 2018, workshop *"Quantum Information and Operator Algebras"*, INdAM, Rome (Italy)
21. June 4-8, 2018, conference "Algebraic Quantum Field Theory: where Operator Algebra meets Microlocal Analysis", INdAM meeting, Cortona (Italy).
    Title of the Talk: "A sufficient condition for the Bisognano-Wichmann property".
22. February 20-22 , 2019, 43rd LQP workshop "Foundations and Constructive aspects of QFT" Galileo Galilei Institute Firenze (Italy). **I am part of the organizing commettee**.
23. April 16-18, 2019, "Algebraic and geometric aspects in Quantum Field Theory", Universität Freiburg, (Germany),
    Invited talk: Bisognano-Wichmann property for asymptotically complete massless theories.
24. December 4-7, 2019,"Operator Algebras in Quantum Field Theory and Quantum Probability", Department of Mathematics, University of Rome Tor Vergata
    Invited talk: Bisognano-Wichmann property for asymptotically complete massless theories.
25. June 17-19, 2020, "First Virtual LQP Workshop - 45th LQP", Cardiff Univ. School of Mathematics
    Title of the talk: Covariant homogeneous nets of standard subspaces

Scientific visits

1. May 30-June 6, 2015 visiting Prof. K.-H. Rehren at Institut für Theoristiche Physik, Göttingen, Germany.
2. January 23-28, 2017, Visiting Prof. Mihaly Weiner at Department of Mathematical Analysis, Budapest University of Technology and Economics (BME)

3. August 21-25, 2017, visiting Dr. Wojciech Dybalski, Technische Universtiät München, München (Germany)
   Invited Seminar talk: "An algebraic condition for the Bisognano-Wichmann property"
4. December 3-8, 2017 visiting Prof. K.-H. Rehren at Institut für Theoristiche Physik, Göttingen, Germany.
   Invited Seminar talk: "An algebraic condition for the Bisognano-Wichmann property".
5. March 11-16, 2018, visiting Dr. Wojciech Dybalski, Technische Universtiät München, München (Germany)
   Invited Seminar talk: "Comments on the Split property for conformal theories in 3+1 dimensional spacetime"
6. November 5-10, 2018, visiting Dr. Wojciech Dybalski, Technische Universtiät München, München (Germany)
   Invited Seminar talk: "Scale and Möbius covariance in two-dimensional Haag-Kastler net"
7. January 27 - February 2, 2019, visiting Prof. Gandalf Lechner, Univ. Cardiff, School of Mathematics (United Kingdom)
   Invited Seminar talk: "Scale and Möbius covariance in two-dimensional Haag-Kastler net"
8. April 8-12, 2019, Visiting Prof. Claudio Dappiaggi, Univ. Pavia. (Italy).
   Invited Seminar talk: Split property for free massless finite helicity fields.
9. May 5-10, 2019, visiting Dr. Daniela Cadamuro, Institute of Theoretical Physics, Leipzig (Germany).
   Invited Seminar talk: Split property for free massless finite helicity fields.
10. July 21-26, 2019, visiting K.-H. Neeb, Department Mathematik, FAU Erlangen-Nürnberg, (Germany).
    Invited Seminar talk: On the Bisognano-Wichmann property for one-particle nets.
11. February 23- March 6, 2020, visiting K.-H. Neeb, Department Mathematik, FAU Erlangen-Nürnberg, (Germany).
    Invited Seminar Talk: Spacelike deformations: Higher-spin fields from scalar fields

Teaching:

- Teaching assistance at University of Rome "Tor Vergata":
  - **a.y. 2020/2021** Course: "Analisi Matematica 1" at Engineering department, Tor Vergata University (Prof. Marco Caponigro).
  - **a.y. 2019/2020** Course: "Matematica Generale" at Economy and Finance department, Tor Vergata University (Prof. Stefano Viaggiu).
  - **a.y. 2018/2019** Course: "Matematica Generale" at Economy and Finance department, Tor Vergata University (Prof. Stefano Viaggiu).
  - **a.y. 2017/2018** Course: "Matematica Generale" at Economy and Finance department, Tor Vergata University (Prof. Stefano Viaggiu).
  - **a.y. 2016/2017** Course: "Matematica Generale" at Economy and Finance department, Tor Vergata University (Prof. Stefano Viaggiu).
  - **a.y. 2015/2016** Course: "Matematica Generale" at Economy department, Tor Vergata University (Prof. Stefano Viaggiu).
  - **a.y. 2012/2013** Teaching assistance for the Bachelor/Master degree courses in Mathematics (Prof. Livio Triolo).
- Teaching assistance at University of Rome "Roma Tre":
  - **from a.y 2010/11 to a.y. 2011/12** Course of Mathematical Analysis: "AM210 - Analisi Matematica 3" at Mathematics Department (Prof. Giovanni Mancini).
  - **a.y. 2011/12** Course of Mathematical Analysis: "AM120 - Analisi Matematica 2" at Mathematics Department (Prof. Luigi Chierchia).
  - **a.y 2009/10** Course of Mathematical Analysis: "AM2 - Analisi Matematica 2" at Mathematics Department (Prof. Giovanni Mancini).
  - **a.y. 2009/10** Course of Mathematical Analysis: "AM3 - Analisi Matematica 3" at Mathematics Department (Prof. Pierpaolo Esposito).

For Recommendation Information

- **Prof. Roberto Longo**, Univ. of Rome Tor Vergata, longo@mat.uniroma2.it
- **Prof. Karl-Henning Rehren**, Univ. of Göttingen, rehren@theorie.physik.uni-goettingen.de
- **Prof. Karl-Hermann Neeb**, Univ. Erlangen-Nürnberg, neeb@mi.uni-erlangen.de

Additional information:

- Member of INdAM-GNAMPA from 2012
- **Science communication:** 2016-2017, attending the "Scuola Sperimentale di Comunicazione della Scienza" ("Sperimental school of Science Communication"), Rome, Italy: school with lectures given by experts in communicating science for INFN, ASI, CNR, Radio Tre, and chief editors of Zanichelli
  `http://maddmaths.simai.eu/news-2/scuola-sperimentale-di-comunicazione-della-scienza-201617/`

  I collaborate with the blog on Mathematics and its applications: *Math is in the air - Blog divulgativo sulla matematica applicata*: `http://www.mathisintheair.org/wp/author/vincenzo/`
  The article on false positive had more than 1500 reads.
- Programming Languages/Mathematics Software: C, Mathematica.
- Languages: Italian (native language), English (second language), French (Intermediate), German (beginner)
- September, 2007, Grant by Roma Tre University for first year students of Bachelor's courses of Mathematics.
- May, 2011, 14^{th} placement to the mathematical national contest organized by INdAM

Le dichiarazioni rese nel presente curriculum sono da ritenersi rilasciate ai sensi degli artt. 46 e 47 del D.P.R. 445/2000.

Rome, 01/12/2020

Vincenzo Morinelli

MARCO OLIVIERI

Post-Doc Researcher in Mathematics
Karlsruhe Institute of Technology (KIT),
Institute for Analysis (IANA)
CRC 1173, Project A11

PROFESSIONAL ADDRESS:
Englerstrasse 2, 76131 Karlsruhe (Germany)

SPOKEN LANGUAGES:

Italian
English
French
German

RESEARCH INTERESTS:

- Effective limits of models of quantum particles interacting with quantized radiation.
- Semiclassical analysis in infinite dimensions.
- Retardation effects for quantized electromagnetic fields.
- Spectral theory on quantum graphs.

EDUCATION

PhD degree in Mathematics
January 2020,
University of Rome "La Sapienza"
Thesis: "*Quasi-classical dynamics of quantum particles interacting with radiation*"
Advisors: M. Correggi, M. Falconi
Committee for the defense: A. Giuliani, D. Benedetto, D. Noja.

Master degree in Mathematics
July 2016
University of Rome "La Sapienza"
Grade: 110/110 cum laude
Thesis: "*The inverse spectral problem for quantum graphs*"
Advisors: A. Teta, D. Finco.

Bachelor degree in Mathematics
July 2014
University of Rome "La Sapienza"
Grade: 110/110 cum laude
Thesis: "*Black-Scholes equation*"
Advisor: D. Benedetto.

High School Diploma
July 2011
Liceo Scientifico E. Majorana
Grade: 100/100 cum laude.

POSITIONS

Post-Doc Researcher
January 2020 - ongoing
in Karlsruhe Institute of Technology (KIT),
Institute for Analysis (IANA),
working group of D. Hundertmark for the project A11 (CRC1173).

PhD Student in Mathematics
November 2016 – January 2020
In University of Rome "La Sapienza"
Advirors: M. Correggi, M. Falconi

PUBLICATIONS

1. M. Correggi, M. Falconi, M. Olivieri, *Ground State Properties in the Quasi-Classical Regime*, preprint arXiv:2007.09442 (2020).
2. M. Correggi, M. Falconi, M. Olivieri, *Quasi-Classical Dynamics*, preprint arXiv:1909.13313 (2019).
3. R. Carlone, M. Correggi, M. Falconi, M. Olivieri, *Microscopic Derivation of Time-dependent Point Interactions*, preprint arXiv:1904.11012 (2019).
4. M. Correggi, M. Falconi, M. Olivieri, *Magnetic Schrödinger operators as the quasi-classical limit of Pauli–Fierz-type models*, J. Spectr. Theory 9, 1287-1325 (2019).
5. D. Finco, M. Olivieri, *On the inverse spectral problems for quantum graphs*, in Advances in Quantum Mechanics: Contemporary Trends and Open Problems, A. Michelangeli, G. Dell'Antonio edts., 267-281 (2017).

AFFILIATIONS

Member of International Association of Mathematical Physics (IAMP)

Member of Gruppo Nazionale di Fisica Matematica (GNFM) of INDAM

Member of CRC1173, project A11
Position financed by DFG

VISITS

2019: Scientic collaboration at “GSSI", L'Aquila (Italy),
for the project “*Progetto Giovani 2019*",
principal investigator: S. Cenatiempo,
period: December 18-20th.

2019: PhD student in visit at “Université de Rennes I", France,
supervisor: Z. Ammari,
period: August-October 2019.

2019: visit at “Université de Rennes I", France,
invitation from: Z. Ammari,
period: one week in April 2019.

2018: visit at “Université de Rennes I", France,
invitation from: Z. Ammari,
period: one week in April 2018.

2018: PhD student in visit at “University of Tübingen", Germany,
supervisor: S. Teufel,
period: February-July 2018.

2016: research training fellowship for undergraduate students
at SISSA, Trieste, Italy,
supervisor: A. Michelangeli,
period: one week in May 2016.

TALKS

2020: PhD defense in “Sapienza", University of Rome (Italy),
title: “*Quasi-Classical Dynamics of Quantum Particles Interacting with Radiation*",
Committee: A. Giuliani (president), D. Benedetto, D. Noja.

2019: Talk in “Sapienza", University of Rome (Italy),
title: “*Quasi-Classical Dynamics of Systems of Particles Interacting with Bosonic Fields*",
for the cycle of “Mathematical Physics seminars",
Seminar related to PhD thesis.

2019: Contributed talk at the workshop “*Spectral theory & Semiclassical Analysis*", in Institute Mittag-Leer, Stockholm (Sweden),
title: ”*Derivation of time-dependent point interactions from polaron models*."
from a joint work with R. Carlone, M. Correggi, M. Falconi.

2018: Contributed talk at the conference “*Gran Sasso Quantum Meetings: from many particle systems to quantum fluids*", in “GSSI" (Italy),
title: “*Microscopic derivation for time-dependent point interactions in ionization models*",
from a joint work with R. Carlone, M. Correggi, M. Falconi.

2018: Talk in “Université de Rennes I", France,
title: “*Derivation of Magnetic Laplacians from Microscopic Models*",
from a joint work with M. Correggi, M. Falconi,
invitation from: Z. Ammari.

2018: Contributed talk at the conference “*Mathematical Challenges in Quantum Mechanics*", in “Sapienza" University of Rome, Italy
title: “*Quasi-classical limit for the Pauli-Fierz model*".
from a joint work with M. Correggi, M. Falconi.

2018: Talk in “Sapienza" University of Rome, Italy,
title: “*The Mathematical theory of Mechanics: between Classical and Quantum*", for the cycle “*Young researcher seminar*".

CONFERENCES

2020: participation at the cycle of seminars of “*CRC seminars*”, organized by CRC1173, Karlsruhe Institute of Technology (Germany).

2019: participant at the conference “*QMath14: Mathematical Result in Quantum Physics*" in Aarhus University, Aarhus (Denmark), winner of poster competition in “Many Body Systems" session,
title: “*Quasi-Classical Dynamics of the Nelson Model*".

2019: participant at the conference “*Tübingen-Zürich Meeting in Mathematical Physics*" in University of Tübingen, Tübingen (Germany).

2019: speaker and participant at the workshop “*Spectral theory & Semiclassical Analysis*" in Institute Mittag-Leer, Stockholm (Sweden) Contributed talk,
title: “*Derivation of time-dependent point interactions from polaron models*".

2018: speaker and participant at the conference “*Gran Sasso Quantum Meetings: from many particle systems to quantum fluids*" in GSSI, L'Aquila (Italy). Contributed talk,
title: “*Microscopic derivation for time-dependent point interactions in ionization models*".

2018: participant at the conference “*Trails in Quantum Mechanics and Surroundings*" in Politecnico di Torino, Torino (Italy).

2018: participant at the conferences “*International Congress of Mathematical Physics (ICMP)*" and “*Young Researchers Symosium*" in Centre Mont-Royal, Montreal (Canada).

2018: speaker and participant at the conference “Mathematical Challenges in Quantum Mechanics", “Sapienza" University of Rome (Italy). Contributed talk,
title: “*Quasi-classical limit for the Pauli-Fierz model*".

2018: participant at the conference “*Trails in Quantum Mechanics and Surroundings* ", in S.I.S.S.A., Trieste (Italy).

2017: participant at the one-day meeting “*The many aspects of Low Energy Physics*", in “Federico II" University of Naples (Italy).

2017: participant at the summer school “*Insubria Summer School in Mathematical Physics*" in “University of Insubria", Como (Italy).

2017: participant at the summer school “*Current topics in Mathematical Physics*" in “University of Zurich", Zurich (Switzerland).

2017: participant at the conference “*Quantum Mean Field and Related Problems*" in “Université Paris 13", Paris (France).

2017: participant at the conference “*Spectral Days 2017*" in “Universität Stuttgart", Stuttgart (Germany).

2016: participant at the International Indam workshop “*Contemporary Trends in the Mathematics of Quantum Mechanics*".

AWARDS AND GRANTS

2019: fellowship “*Progetto Giovani GNFM 2019*", Young Researchers program of the Italian Group of Mathematical Physics (GNFM). Investigators: S. Cenatiempo (P.I.), C. Caraci, M. Falconi and M. Olivieri, obtained fundings for research activities.

2019: fellowship for internationalization of “Sapienza" University of Rome,
for the project “*Magnetic Schrödinger Operators in Quantum Mechanics*", in joint work with PhD L. Oddis,
obtained fundings for a visit of 3 months at the “Université de Rennes 1" (France).

2018: fellowship for internationalization of “Sapienza" University of Rome,
for the project “*Effective Limits in Quantum Dynamics*",
in joint work with PhD M. Moscolari,
obtained fundings for a visit of 6 months
at the “University of Tübingen" (Germany).

2018: fellowship “*Progetti per Avvio alla Ricerca - Tipo 1, 2018*" of “Sapienza" University of Rome, for the project “*Dinamica effettiva come limite quasi-classico di modelli di interazione campo-particella*",
obtained fundings for research activities.

2018: fellowship “*Progetto Giovani GNFM 2017*", Young Researchers program of the Italian Group of Mathematical Physics. Investigators: R. Carlone, M. Falconi, D. Fermi, and M. Olivieri, obtained fundings for research activities.

2017: fellowship “*Progetti per Avvio alla Ricerca - Tipo 1, 2017*" of “Sapienza" University of Rome, for the project “*Il limite semiclassico per il modello di interazione di Pauli-Fierz*",
obtained fundings for research activities.

TEACHING ACTIVITY

2020: correction and evaluation of written exams in Mathematics courses held in Karlsruhe Institute of Technology (KIT).

2019: tutor for the course “*Calculus and Biostatistics*", Department of Biology, “Sapienza" University of Rome.

2017: tutor for the course “*Mathematical Physics*", Department of Mathematics, “Sapienza" University of Rome.

2017: tutor for the course “*Mathematical and Computer Methods for Biology*", Department of Biology, “Sapienza" University of Rome.

2016: tutor for the course “*Probability 1*" for the project “Laurea Tutoring 2", Department of Mathematics, “Sapienza" University of Rome.

OTHER SKILLS

2020: Participation at the Webinar “*Scientific writing*”, offered by Karlsruhe Institute of Technology (KIT), Germany.

Programming languages: C++, Fortran 90, Matlab.
Good knowledge of Linux system and LaTeX.

Curriculum Vitæ

November 18, 2020

Education and academic positions

2018-present	**Full research grant**; Universidad de Buenos Aires
2017-2018	**Postdoc**; Universidad de Buenos Aires; supervisor: P. Groisman
2015-2017	**Postdoc**; Gran Sasso Science Institute; supervisor: E. Presutti
2010-2015	**PhD in Mathematics**; Universidad de Buenos Aires; advisors: P. A. Ferrari and I. Armendáriz
2006-2010	**Licenciatura en Matemática**; Universidad Nacional de La Plata; grade: 9.94/10
2004-2006	**Ingeniería Civil (not concluded)**; Universidad Nacional de La Plata

Scientific production

Published articles

1. **Generalized max-weight policies in stochastic matching**
   With M. Jonckheere, P. Moyal and C. Ramírez
   arXiv:2011.04535
   Submitted to Queueing Systems: Theory and Applications (QUESTA)

2. **Rank Dependent Branching-Selection Particle Systems**
   With P. Groisman
   arXiv:2008.09460
   Submitted to The Electronic Journal of Probability (EJP)

3. **Non local branching Brownians with annihilation and free boundary problems**
   With A. De Masi, P. A. Ferrari and E. Presutti
   Electron. J. Probab., Volume 24 (2019), paper no. 63, 30 pp.

4. **Turing instability in a model with two interacting Ising lines: linear stability and non-equilibrium fluctuations**
   With M. Capanna
   J Stat Phys (2019) 174: 365. https://doi.org/10.1007/s10955-018-2206-7

5. **Turing instability in a model with two interacting Ising lines: hydrodynamic limit**
   With M. Capanna
   Markov Proc. Rel. Fields, 23(3):401-420, 2017

6. **Large deviations for spatially inhomogeneous magnetization and Young-Gibbs measures**
   With A. Montino and D. Tsagkarogiannis
   J. Stat. Phys. (2016) 164: 1318

7. **Transición de fase para modelos diluidos y grandes desvíos para magnetizaciones no homogéneas (PhD Thesis)**
   `http://cms.dm.uba.ar/academico/carreras/doctorado/tesis_sopranoloto.pdf`
   Universidad de Buenos Aires

8. **Phase transition for the dilute clock model**
   With I. Armendáriz and P. A. Ferrari
   Stochastic Process. Appl., 125(10):3879-3892, 2015
   arXiv:1404.4071

Book chapters

Hydrodynamics of the N-BBM process
With A. De Masi, P. A. Ferrari and E. Presutti
Chapter of the book Stochastic Dynamics out of Equilibrium, Springer Proceedings in Mathematics & Statistics series, Volume 282, ISBN 978-3-030-15095-2

Articles in preparation

Uniqueness and non-uniqueness criteria based on the generalized FK representation
With R. Fernández

Presentations

Conference talks

2020 **Bernoulli-IMS One World Symposium 2020**

2017 **Annual meeting of the Argentinian Mathematics Society**; Buenos Aires, Argentina

2017 **Thematic meeting in large deviations theory**; Montevideo, Uruguay

2017 **IHP trimester "Stochastic Dynamics Out of Equilibrium"**; Paris, France

2016 **From statistical mechanics to context tree estimation**; Cergy, France

2014 **XVIII Escola Brasileira de Probabilidade**; Mambucaba, Brazil

2014 **Conference on Stochastic Processes and Their Applications**; Buenos Aires, Argentina

Seminar talks

2018 **Math Probability Seminar Series**; NYU Shanghai

2017 **Seminario de Probabilidad**; Universidad de Buenos Aires

2016 **Seminario de Probabilidad**; Universidad de Buenos Aires

2014 **Seminario de Probabilidad**; Universidad de Buenos Aires

2013 **Stochastics Colloquium**; Utrecht University

2013 **Most Informal Probability Seminar**; Leiden University

2013 **Sztochasztika Szeminárium**; Budapest University of Technology and Economics

Posters

2017 **XXI Escola Brasileira de Probabilidade**; Rio de Janeiro, Brazil

Fellowships and awards

2017-2018 **Beca Interna Posdoctoral**; Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET)

2015-2017 **Full Research Grant**; Gran Sasso Science Institute

2013-2015 **Beca Interna Doctoral Tipo II**; Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET)

2010-2013 **Beca Interna Doctoral Tipo I**; Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET)

2010 **Distinción Dr. Joaquín V. GONZÁLEZ**; Special Mention Award for the best grade of the Faculty of Exact Sciences; Universidad Nacional de La Plata

2007 **Competencia Ernesto Paenza (math competition for university students)**; 5th place with P. De Caria; Universidad Nacional de La Plata

2000, 2003 **Argentinian Mathematics Olympiad**; Special Mention Award

1997 **Argentinian Mathematics Olympiad**; 3rd place

1997 **Clubes Cabri Competition (competition in geometry)**; 1st place

Teaching experience

2018-present **Graduate teacher instructor**; Universidad de Buenos Aires

2012-2015 **Graduate teacher instructor**; Universidad Nacional de La Plata

2012-2013 **Math Olympiad training instructor**; Colegio Nacional Rafael Hernández

2006-2012 **Graduate teacher assistant**; Universidad Nacional de La Plata

Events organization

2019 **Analysis/Noncommutative Analysis/Probability-Stochastics/PDEs and Applications**; Buenos Aires, Argentina

2018 **Geometry and scaling of random structures**; Buenos Aires, Argentina

Scientific visits

2019 **Université de Lorrainei**; P. Moyal

2018 **NYU Shanghai**; P. Groisman

2014 **University of Sussex**; D. Tsagkarogiannis

2014 **University of Warwick**; S. Grosskinsky

2013 **Gran Sasso Science Institute**; E. Presutti

2013 **Utrecht University**; R. Fernández

2013 **Budapest University of Technology and Economics**; B. Toth

Conferences and schools attendance

2018 **Random Physical Systems**; Puerto Natales, Chile

2017 **31st Brazilian Mathematical Colloquium**; Rio de Janeiro, Brazil

2016 **Nonequilibrium: Physics, Stochastics and Dynamical Systems**; Marseille, France

2014 **Glassy Systems and Constrained Stochastic Dynamics**; Warwick, England

2014 **Gradient Random Fields**; Warwick, England

2013 **School on Mathematical Statistical Physics**; Prague, Czech Republic

2013 **XVII Escola Brasileira de Probabilidade**; Mambucaba, Brazil

2013 **29º Colóquio Brasileiro de Matemática**; Rio de Janeiro, Brazil

2013 **IMPA summer school**; Rio de Janeiro, Brazil

2012 **CIMPA school "Stochastic dynamics of particles and networks"**; Mar del Plata, Argentina

2012 **PASI: Topics in percolative and disordered systems**; Santiago de Chile and Buenos Aires, Chile and Argentina

2012 **XV Escola Brasileira de Probabilidade**; Mambucaba, Brazil

2010 **School of Information and Randomness**; Pucón, Chile

2010 **XIV Escola Brasileira de Probabilidade**; Mambucaba, Brazil

2010 **Annual meeting of the Argentinian Mathematics Society**; Tandil, Argentina

2010 **CLAY summer school "Probability and Statistical Physics in Two and more Dimensions"**; Búzios, Brazil

2009 **Annual meeting of the Argentinian Mathematics Society**; Mar del Plata, Argentina

2009 **IMPA summer school**; Rio de Janeiro, Brazil

2008 **Annual meeting of the Argentinian Mathematics Society**; Mendoza, Argentina

2008 **3rd Meeting of Differential Equations**; Buenos Aires, Argentina

2006 **Annual meeting of the Argentinian Mathematics Society**; Bahía Blanca, Argentina

Research grants

2015-2018 **Grafos aleatorios, procesos puntuales y metaestabilidad**; manager: P. A. Ferrari; Fondo para la Investigación Científica y Tecnológica (FONCYT)

2014-2017 **Procesos Estocásticos y Mecánica Estadística**; manager: P. A. Ferrari; Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET)

2013-2016 **Procesos Estocásticos y Mecánica Estadística**; manager: P. A. Ferrari; Universidad de Buenos Aires

2013-2016 **Procesos Estocásticos con Interacción**; manager: P. A. Ferrari; Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET)

2010-2013 **Probabilidad y Procesos Estocásticos**; manager: P. A. Ferrari; Agencia Nacional de Promoción Científica y Tecnológica

2010-2013 **Procesos Estocásticos**; manager: P. A. Ferrari; Universidad de Buenos Aires

Additional experience

2012 **International Mathematical Olympiad coordinator**; Mar del Plata, Argentina

Languages: Spanish (native language), English, Portuguese and Italian

References

I. Armendáriz (PhD Advisor)	ines.armendariz@gmail.com	Universidad de Buenos Aires
R. Fernández	R.Fernandez1@uu.nl	NYU Shangai
P. A. Ferrari (PhD Advisor)	pferrari@dm.uba.ar	Universidad de Buenos Aires
P. Groisman (Postdoc Supervisor)	pgroisma@dm.uba.ar	Universidad de Buenos Aires
E. Presutti (Postdoc Supervisor)	errico.presutti@gssi.infn.it	Gran Sasso Science Institute

INFORMAZIONI PERSONALI

Alessio Troiani

FORMAZIONE

Ottobre 2012 — Doctoral degree (Dottorato di ricerca - titolo equipollente)
Università di Leiden (Paesi Bassi) Titolo della tesi: "Metastability for low-temperature Kawasaki dynamics with two types of particles".
Relatori: Prof. Dr. F. den Hollander (Università di Leiden) e Dr. F. R. Nardi (TU Eindhoven).

Ottobre 2007 — Laurea Specialistica *cum laude* in Ingegneria Gestionale
Università degli Studi di Roma "Tor Vergata"
Relatore: Prof. B. Scoppola.

Luglio 2007 – Ottobre 2007 — Visiting Student (Special Focus Year on Discrete Random Systems)
Center for Discrete Mathematics and Theoretical Computer Science (DIMACS) – Rutgers, The State University of New Jersey
Supervisore: Prof. Dr. J. L. Lebowitz.

Ottobre 2004 — Laurea *cum laude* in Ingegneria Gestionale
Università degli Studi di Roma "Tor Vergata"
Relatore: Prof. B. Scoppola.

ATTIVITÀ ACCADEMICA

Ottobre 2020 – Settembre 2021 — Assegnista di ricerca
Dipartimento di Matematica – Università degli Studi di Padova
Tema di ricerca: Statistical Mechanics of Gravitational Systems
Supervisor: Prof.ssa Gabriella Pinzari

Maggio 2018 – Maggio 2020 — Assegnista di ricerca
Dipartimento di Matematica – Università degli Studi di Padova
Tema di ricerca: Statistical Study of Gravitational Systems
Supervisor: Prof.ssa Gabriella Pinzari

Maggio 2017 – Aprile 2018 — Assegnista di ricerca
Dipartimento di Matematica – Università degli Studi di Firenze
Tema di ricerca: Dinamiche stocastiche parallele e applicazioni alla meccanica statistica
Supervisor: Prof.ssa Francesca R. Nardi

Novembre 2015 – Novembre 2016

Assegnista di ricerca

Dipartimento di Matematica – Università degli Studi di Roma "Tor Vergata"
Tema di ricerca: Dinamiche stocastiche parallelle e calcolo su GPU
Supervisor Prof. Benedetto Scoppola

ATTIVITÀ DI INSEGNAMENTO

Febbraio 2020 – Maggio 2020

Docente a contratto

Corso "Statistics" – LUISS Guido Carli

Febbraio 2020 – Giugno 2020

Assistente alla didattica

Corso "Applicazioni della Fisica Matematica" – Dipartimento di Matematica e Fisica – Università degli studi di Roma "Tre"

Febbraio 2019 – Maggio 2019

Docente a contratto

Corso "Statistics" – LUISS Guido Carli

Settembre 2018 – Dicembre 2018

Docente a contratto

Corso "Elementary probability"– LUISS Guido Carli

Febbraio 2018 – Maggio 2018

Docente a contratto

Corso "Statistics" – LUISS Guido Carli

Settembre 2017 – Dicembre 2017

Docente a contratto

Corso "Elementary probability"– LUISS Guido Carli

Settembre 2016 – Dicembre 2016

Assistente alla didattica

Corso "Elementary probability"– LUISS Guido Carli

Marzo 2016 – Giugno 2016

Assistente alla didattica

Corso "Calcolo delle probabilità" – Dipartimento di Matematica – Università degli studi di Roma "Tre"

Gennaio 2011 – Giugno 2011

Assistente alla didattica

Corso "Stochastic Processes" – "Dutch master's degree program in mathematics" – Paesi Bassi.

Settembre 2009 – Gennaio 2012

Assistente alla didattica

Corso "Introductory Statistics" (anni accademci 2009/10 - 2010/11 - 2011/12) – Facoltà di Scienze – Università di Leiden – Paesi Bassi

PUBBLICAZIONI E PREPRINT

Pubblicate:

1. Metastability for Kawasaki dynamics with two types of particles: stable/metastable configurations and communication heights, *Journal of Statistical Physics*, 145, 1423–1457,

2011, https://doi.org/10.1007/s10955-011-0370-0 (with F. den Hollander and F. R. Nardi).

2. Metastability for Kawasaki dynamics at low temperature with two types of particles, *Electronic Journal of Probability*, 17(2), 1–26, 2012, doi:10.1214/EJP.v17-1693 (with F. den Hollander and F. R. Nardi).
3. Metastability for Kawasaki dynamics with two types of particles: critical droplets, *Journal of Statistical Physics*, 149, 1013–1057, 2012,https://doi.org/10.1007/s10955-012-0637-0 (with F. den Hollander and F. R. Nardi).
4. Metastability for Kawasaki dynamics with two types of particles, PhD Thesis, 2012, ISBN 9789461914644, handle: http://hdl.handle.net/1887/20065
5. The blockage problem, *Bulletin of the Institute of Mathematics Academia Sinica (New Series)*, 8(1), 49–72, 2013, ISSN: 2304-7895 [online] (with O. Costin, J. L. Lebowitz and E. R. Speer).
6. Gaussian Mean Fields Lattice gas, *Journal of Statistical Physics* (2018), 170:1161, https://doi.org/10.1007/s10955-018-1984-2, (with B. Scoppola)
7. Criticality of measures on 2-d Ising configurations: from square to hexagonal graphs, *Journal of Statisticsl Physics* (2019), https://doi.org/10.1007/s10955-012-0637-0 (with V. Apollonio, R. D'Autilia, B. Scoppola and E. Scoppola)

Preprints:

8. Parallel simulation of two–dimensional Ising models using Probabilistic Cellular Automata, (2019), arXiv:1908.07341,(with R. D'Autilia and L. Nantenaina Andrianaivo)
9. Lonely planets and light belts: the Statistical Mechanics of Gravitational Systems, (2020), arXiv:2006.07003 (with G. Pinzari and B. Scoppola)
10. Shaken dynamics: an easy way to parallel MCMC (2020), arXiv:1904.06257, (with V. Apollonio, R. D'Autilia, B. Scoppola and E. Scoppola)

SELECTED TALKS

Ottobre 2020	Series of Seminars on Machine Learning, Optimization and Data Analysis, Unversità di Roma "Tor Vergata" (Italy)
Giugno 2019	Second Italian Meeting on Probability and Mathematical Statistics, Vietri sul Mare (Italia)
Marzo 2019	Mathematical Physics and Related Subjects Seminar, Università di Padova (Italia)
Maggio 2018	Probability Seminar, Università di Leiden (Paesi Bassi).
Marzo 2012	Mark Kac Seminar on Stochastics and Physics, Utrecht (Paesi Bassi).
Luglio 2011	Cornell Probability Summer School, Ithaca (USA).

Maggio 2011 Oberseminar Stochastics, Università di Bonn (Germania).

Maggio 2010 Probability Seminar, Università di Leiden (Paesi Bassi).

ATTIVITÀ NON ACCADEMICA

Dicembre 2014 – Dicembre 2018

Attività di consulenza e formazione su
- Salute e sicurezza nei luoghi di lavoro
- Igiene degli alimenti
- Quality management

Ottobre 2012 – Giugno 2014

Software Engineer
Team di Studi Statistici (dipartimento di revenue management)
Amadeus (Sophia Antipolis - Francia)

Febbraio 2008 – Aprile 2008

Business Analyst
Accenture Italia S.p.a.

COMPETENZE PERSONALI

MADRELINGUA Italiano

ALTRE LINGUE

	Comprensione		Parlato		Produzione scritta
	Ascolto	Lettura	Interazione	Produzione orale	
Inglese	C2	C2	C2	C2	C2
Francese	B1	C1	B2	B1	B1
Olandese	A2	A2	A2	A2	A2

A1, A2: Utente base; B1, B2: Utente autonomo; C1, C2: Utente avanzato

LINGUAGGI DI PROGRAMMAZIONE Python, Julia, C/C++, Fortran, R, CUDA, SQL, LaTeX

europass Curriculum vitae

PERSONAL INFORMATION Jacopo Viti

SHORT BIO

I am a theoretical physicist specialized in Statistical Physics. I earned my Ph.D. from the International Institute of Advanced Studies (SISSA) of Trieste in Italy in 2012, where I worked on Quantum Field Theories applied to Statistical Mechanics.

In the years 2012-2014, I was employed as a post-doctoral researcher by the Laboratoire de Physique Theorique (LPT) de l'École Normale Supérieure in Paris. Finally, in 2014-2016, I completed a second post-doc at the Max Planck Institute for the Physics of Complex Systems (MPIPKS) in Dresden, working on out-of-equilibrium quantum systems.

Since February 2016, I am an Assistant Professor at the Federal University of Rio Grande do Norte (UFRN). From August 2017, I am also a Research Leader in Statistical Physics at the International Institute of Physics (IIP) of Natal (Brazil). In 2020, I spent a sabbatical leave at the Italian National Institute for Nuclear Physics (INFN) in Florence (Italy).

ACADEMIC POSITIONS

Aug 2017 – Present — Research Leader in Statistical Physics
International Institute of Physics (IIP), Natal, Brazil.

Feb 2016 – Present — Assistant Professor (currently on leave of absence)
Federal University of Rio Grande do Norte (UFRN), Natal, Brazil.
Affiliated to the mathematics department of the School of Science and Technology (ECT).

Oct 2014 – Feb 2016 — Research Associate (Post-doc)
Max Planck Institute for the Physics of Complex Systems (MPIPKS), Dresden, Germany.
Independent post-doc in the group of Prof. R. Moessner.

Oct 2012 – Sep 2014 — Research Associate (Post-doc)
LPT-École Normale Supérieure, Paris, France.
Supervisor: Prof. D. Bernard.

EDUCATION

2008–2012 — PhD in Statistical Physics
SISSA, Trieste, Italy
Thesis title: *'Universal properties of two-dimensional percolation'*, Advisor: Prof. G. Delfino.

2005–2008 **Laurea Specialistica (Master) in Physics**

University of Florence, Florence, Italy

Thesis title: *'Entanglement entropy in two-dimensional conformal field theories' (in italian)*, Advisor: Dr. A. Cappelli, Mark: 110/110 (cum laude).

2001–2005 **Laurea Magistrale (Bachelor) in Physics**

University of Florence, Florence, Italy

Thesis title: *'La precessione di Thomas e le sue applicazioni'*, Advisor: Prof. G. Longhi, Mark: 110/110 (cum laude).

VISITING POSITIONS

Jan 2020 – Dec 2022 INFN Researcher at Florence University (Florence, Italy)

ADDITIONAL INFORMATION

Italian Habilitations (ASN) Associate Professor FIS 02/A2 (until 07/01/2029), Associate Professor FIS 02/B2 (until 10/05/2028)

Referee activity Referee for JHEP, JSTAT, JPhys A, PRA, PRB, PRE, PRL, PRR, SciPost

Research activity (keywords) Statistical Mechanics and Critical Phenomena, Conformal Field Theory, Quantum Dynamics and Entanglement, Lattice Models.

PERSONAL SKILLS

Mother tongue Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
Portuguese	C2	C2	C2	C2	C2
French	B1	B1	B1	B1	B1
German	A1	A1	A1	A1	A1

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
Common European Framework of Reference for Languages

Digital competences

SELF-ASSESSMENT				
Information Processing	Communication	Content creation	Safety	Problem solving
Proficient user	Proficient user	Proficient user	Proficient user	Proficient user

Digital competences - Self-assessment grid

Computer skills – Proficient user (professional): Linux, Mathematica

Driving license B

TEACHING AND SUPERVISING ACTIVITY

Undergraduate level *From February 2016*, I am teaching the semestral courses (one per semester) *Vetores e Geometria Analítica* (Vectors and Analytic Geometry) and *Álgebra Linear* (Linear Algebra), for 1st and 2nd year undergraduates respectively. The total number of teaching hours per year is 120h/semester, including exams. The total amount of students attending each course is around 200 for each semester. The courses are mandatory for first and second year students at the School of Science and Technology of UFRN.

Graduate level

- *July 2019-December 2019:* I taught the graduate course (60h/semester) *Teoria dos grupos e álgebras de Lie* (Group Theory and Lie Algebras) for graduate students at the Physics department of the UFRN. The course introduces elementary notions of Lie Algebras and Lie Groups.
- *February 2019-June 2019:* I taught the graduate course (60h/semester) *Teoria dos campos I* (Quantum Field Theory I) for graduate students at the Physics department of the UFRN. The course introduces the basic computational tools of Quantum Field Theory.
- *February 2018-June 2018:* I taught the graduate course (60h/semester) *Teoria dos campos II* (Quantum Field Theory II) for graduate students at the Physics department of the UFRN. The course introduces the concepts of scaling and renormalization.
- *February 2017:* Topic course on 'Some aspects of quantum transport', three invited lectures (10h) at the PhD School 'Statistical Field Theory Lectures', GGI, Florence, Italy.

Projects for Postdocs

- *Dr. Ivar Lyberg (2 papers), 2016-2018; 'Monte Carlo study of vertex models'.* Now working for Nordic Investment Bank (Tallin, Estonia).
- *Dr. Máté Lencses (3 papers), 2018-2020; 'Entanglement in 1+1 QFTs and Truncated Conformal Space Approach'.* Now at Budapest University.
- *Dr. Filiberto Ares, 2018-present (2 papers); 'Painlevé equations and Toeplitz determinants'*

Master students

- *Bruno Enrique Nogueira*; '*Conectividades no Modelo de Potts Crítico Bidimensional'* (March 2020)

ORGANIZATION ACTIVITY

International Conferences

- *March 2021:* Organizer together with P. Calabrese (SISSA, Italy), O. Castro-Alvaredo (City London, UK), M. Rajapbour (UFF, Brazil) and S. Ryu (Chicago, USA) of the conference *'Entanglement measures in many-body systems'*, two weeks, approx. 60 participants. The conference is hosted by the IIP.
- *May 2019:* Organizer together with B. Doyon (Kings College, UK), J. Dubail (CNRS, France), G. Mussardo (SISSA, Italy), M. Rajapbour (UFF, Brazil) of the conference *'Emergent hydrodynamics in low-dimensional systems'*, three weeks, approx. 60 participants. The conference is hosted by the IIP.
- I also contributed in the local organization and secured financial support through the CAPES agency (http://www.capes.gov.br/index.php) for the following programs held at IIP: 'New Trends in Integrable models' (Aug 2016-Nov 2016), 'Finite Systems in Nonequilibrium: From Quantum Quenches to the Formation of Strong Correlations' (Sep 2017), 'Number theory and physics' (Jun 2020).

Schools

- *From February 2020:* Organizer together with P. Calabrese (SISSA, Italy), A. Cappelli (INFN Florence, Italy), J. Dubail (CNRS, France), F. Essler (Oxford, UK), C. Morais-Smith (Utrecht, Netherlands) and A. Trombettoni (Trieste, Italy) of the *'Statistical Field Theory School'* at GGI (Florence, Italy)

TALKS IN INTERNATIONAL CONFERENCES

Oct 2019 'Emptiness formation probability and the Painlevé V equation in the Ising spin chain', invited talk presented during the conference 'The beauty of theoretical physics, celebrating 60 years of Giuseppe Mussardo', ICTP, Trieste, Italy.

Jul 2019 'Logarithmic correlations in statistical mechanics', invited talk presented during the program 'Random Geometry and Multifractality in Condensed Matter and Statistical Mechanics', IIP, Natal, Brazil.

Oct 2018 'Exact logarithmic correlations in critical percolation', invited talk presented during the program 'Exactly Solvable Model', Simon Center for Geometry and Physics, Stony Brook University, USA.

Jun 2018 'Exact logarithmic correlations in critical percolation', invited talk presented during the program 'Entanglement in Quantum Systems', GGI, Florence, Italy.

Jun 2018 'Exact logarithmic correlations in critical percolation', invited talk presented at the Workshop 'Quantum spin chains and integrable models', IIP, Natal, Brazil.

Sep 2017 'Analytic solution of the Domain Wall Initial State', invited talk presented at the Workshop 'Finite Systems in Nonequilibrium: From Quantum Quenches to the Formation of Strong Correlations', IIP, Natal, Brazil.

Aug 2017 'Analytic solution of the Domain Wall Initial State', contributed talk presented at the Workshop 'Quantum Devices', IIP, Natal, Brazil.

Aug 2016 'Arctic curves in fermionic systems', invited talk presented at the Workshop 'Boundary degrees of freedom and thermodynamic of integrable models', IIP, Natal, Brazil.

Jul 2016 'Quantum dynamics after connecting two integrable spin chains', invited talk presented at the Workshop 'Quantum Systems out-of-equilibrium', IIP, Natal, Brazil.

Apr 2016 'Arctic curves in fermionic systems', invited talk presented at the Workshop 'Statistical Mechanics and Combinatorics', Simon Center for Geometry and Physics, Stony Brook, USA.

Jan 2016 'Inhomogeneous quenches and arctic curves in fermionic systems', contributed talk presented at the Workshop 'Mathematical aspects of quantum systems out-of-equilibrium', Isaac Newton Institute for Mathematics, Cambridge, UK.

Nov 2015 'Inhomogeneous quenches and arctic curves in fermionic systems', invited talk presented at the Workshop 'Quantum many-body systems out-of-equilibrium', Bad-Honnef, Germany.

Aug 2015 'Inhomogeneous quenches and arctic curves in fermionic systems', invited talk presented at the Workshop 'Strongly Coupled Field Theory for Condensed Matter', IIP, Natal, Brazil.

Apr 2015 'Non-equilibrium CFT (with impurities)', invited talk presented at the Workshop 'Statistical physics and low-dimensional systems', Pont-à-Mousson, France.

Mar 2014 'Imaginary Liouville Theory and applications', contributed talk presented at the Workshop 'Quantum Integrability, CFT and Topological Quantum Computation', IIP, Natal, Brazil.

Apr 2013 'The three-point connectivity in the Q-color Potts model', invited talk presented at the Workshop 'Conformal Invariance in Continuous and Discrete Systems', Simon Center for Geometry and Physics, Stony Brook, USA.

Mar 2013 'Non-equilibrium thermal transport in the Quantum Ising chain', contributed talk presented at the Workshop 'MECO, 38-th European Conference for the Middle European Cooperation in Statistical Physics', ICTP, Trieste, Italy.

Apr 2012 'Field Theory approach to percolation and the Potts model', contributed talk presented at the Workshop '2012 British Mathematical Colloquium', Kent University, UK.

Sep 2012 'Universal properties of two-dimensional percolation', contributed talk presented at the conference '8th Bologna workshop on CFT and Integrable models', Bologna, Italy.

INVITED SEMINARS

Dec 2020 'Entanglement entropies and the modular bootstrap for Z_3 Riemann surfaces, virtual seminar at SISSA (Stat. Phys.), Trieste, Italy.

Nov 2020 'Entanglement dynamics in 1+1 dimensions: the example of the Ising spin chain', virtual seminar at Math. Department of City U., London, UK.

Jul 2020 'Entanglement oscillations near a Quantum Critical Point', virtual seminar at International Institute of Physics, Natal, Brazil.

Jan 2020 'Emptiness formation probability and the Painlevé V equation in the Ising spin chain', seminar at Racah Institute for Theoretical Physics, Jerusalem, Israel.

Jun 2018 'Exact logarithmic correlations in critical percolation', seminar at Oxford Physics Department, Oxford, UK.

Jan 2018 'Logarithmic correlations in the Ising model', seminar at Florence University, Florence, Italy.

Dec 2017 'Analytic solution of the Domain Wall initial state', seminar at UFF, Niteroi, RJ, Brazil.

Sep 2017 'Logarithmic correlations in the Ising model', seminar at ICTP-SAIFR, São Paulo, Brazil.

Jul 2017 'Logarithmic correlations in the Ising model', seminar at Lorraine University, Nancy, France.

Feb 2017 'Quantum Quenches near a quantum critical point', seminar at SISSA, Trieste, Italy.

Feb 2017 'Arctic curves in fermionic systems', seminar at Florence University, Florence, Italy.

Apr 2016 'Dimers on the honeycomb lattice', seminar at Simon Center for Geometry and Physics, Stony Brook, USA.

Aug 2015 'Inhomogeneous quenches and arctic curves in fermionic systems', seminar at UFRN, Natal, Brazil.

Nov 2014 'Non-equilibrium steady states in quantum spin chains', seminar at TUD, Dresden, Germany.

May 2014 'Non-equilibrium steady states in quantum spin chains', seminar at Pisa University, Pisa, Italy.

Apr 2014 'Non-equilibrium steady states in quantum spin chains', seminar at MPIPKS, Dresden, Germany.

Sep 2012 'A Field Theory approach to percolation and phase separation in two dimensions', seminar at LPTMS, Orsay, France.

Jun 2012 'Universal properties of two-dimensional percolation', seminar at LPT-ENS, Paris, France.