

Giuseppe Vitagliano

Personal Informations

current affiliation: PhD. student at Department of Theoretical Physics and History of Science, University of the Basque Country

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Education

- Masters' degree with highest honors in Theoretical Physics, University of Pisa, Italy, 2007-2010

Final work (thesis)

Topic Theoretical interplay between Condensed Matter and Quantum Information, focused on the study of Entanglement

Supervisors: prof. *José Ignacio Latorre* (University of Barcelona), prof. *Pasquale Calabrese* (University of Pisa)

Title: *Area laws for Entanglement, QMA-completeness of the local Hamiltonian problem and the simulation of Quantum Mechanics.*

- **2004-2007** Bachelors' degree in Physics with highest honors, University of Pisa, Italy, 2004-2007

Final work (thesis)

Topic: Causality violations of General Relativity

Supervisor: prof. *Enrico Meggiolaro* (University of Pisa)

Title: *Cilindri Rotanti e Possibilità di CTC in Relatività Generale*

- *High School Diploma*, Scientific High School *P.S. Mancini*, Avellino, Italy, 1999-2004

Preprints

- *C. Budroni, G. Vitagliano, G. Colangelo, R. J. Sewell, O. Gühne, G. Tóth, M.W. Mitchell*, Quantum non-demolition measurement enables macroscopic Leggett-Garg tests (2015) <http://arxiv.org/abs/1503.08433>

Papers

1. *B. Lücke, J. Peise, G. Vitagliano, J. Arlt, L. Santos, G. Tóth, and C. Klempt*, Detecting multiparticle entanglement of Dicke states, *Phys. Rev. Lett.* **112**, 155304 (2014); Editors' Suggestion; synopsis at physics.aps.org; article in the *Revista Española de Física*. <http://link.aps.org/doi/10.1103/PhysRevLett.112.155304> <http://arxiv.org/abs/1403.4542>

2. *G. Vitagliano, I. Apellaniz, I.L. Egusquiza, and G. Tóth*, Spin squeezing and entanglement for arbitrary spin, *Phys. Rev. A* **89**, 032307 (2014) <http://link.aps.org/doi/10.1103/PhysRevA.89.032307> <http://arxiv.org/abs/1310.2269>
3. *G. Vitagliano, P. Hyllus, I. L. Egusquiza and G. Tóth*, Spin Squeezing Inequalities for Arbitrary Spin , *Phys. Rev. Lett.* **107**, 240502 (2011) <http://link.aps.org/doi/10.1103/PhysRevLett.107.240502> <http://arxiv.org/abs/1104.3147>
4. *G. Vitagliano, A. Riera and J.I. Latorre*, Volume-law scaling for the entanglement entropy in spin-1/2 chains , *New J. Phys.* **12** 113049 (2010) <http://iopscience.iop.org/1367-2630/12/11/113049>

Other publications

1. *B. Lücke, J. Peise, G. Vitagliano, J. Arlt, L. Santos, G. Tóth, and C. Klempt*, Synopsis: Measuring Entanglement Among Many Particles, *APS physics* (2014) <http://physics.aps.org/synopsis-for/10.1103/PhysRevLett.112.155304>
2. Puntos de interés: A vueltas con el entrelazamiento cuántico, *Revista Española de Física* **Vol 28**, Number 2, page 31 (2014).
3. *G. Vitagliano*, Area laws for Entanglement, QMA-completeness of the local Hamiltonian problem and the simulation of Quantum Mechanics, (Masters' thesis), University of Pisa (2010)
4. *G. Vitagliano*, Cilindri Rotanti e Possibilità di CTC in Relatività Generale, (Bachelors' thesis), University of Pisa (2007)

Talks

- Generalized spin squeezing in the vicinity of Dicke states, **Conference of the German Physical Society**, Heidelberg, Germany, March 23-27, 2015
- Detecting multiparticle entanglement with spin squeezing inequalities, **Información Cuántica en España-1**, Zaragoza, Spain, 25-27 June 2014
- Generalized squeezing inequalities, entanglement and its depth, **Conference of the German Physical Society**, Berlin, Germany, 17-21 March 201
- SU(d) squeezing and entanglement in systems of d-level particles, **4th International Workshop on Quantum Entanglement and its Detection (QED4)**, Siegen, Germany, 23-27 September, 2013.
- SU(d) squeezing and entanglement in systems of d-level particles, **Conference of the German Physical Society**, Hannover, Germany, 18-22 March 2013

- Spin squeezing inequalities for spin- j particles, **3rd International Workshop on Quantum Entanglement and its Detection (QED3)**, Bilbao, Spain, 3-7 September 2012
- Spin squeezing and entanglement in systems of spin- j particles, **Conference of the German Physical Society**, Stuttgart, Germany, 12-16 March, 2012
- Volume law scaling of entanglement entropy in spin chains, **Conference of the German Physical Society**, Dresden, Germany, 13-18 March, 2011
- Entanglement detection in systems of spin- j particles with collective observables, **Conference of the German Physical Society**, Dresden, Germany, 13-18 March, 2011

Invited

- Spin squeezing inequalities for higher spin particles, **COQUIT workshop**, Torino, Italy, 11-14 September, 2012
- Spin squeezing for higher spins, **2nd International Workshop on Quantum Entanglement and its Detection (QED2)**, University of Siegen, Germany, 21 September, 2011
- Volume law scaling of entanglement entropy in spin chains, **ISI Foundation**, Torino, Italy, 18 July, 2011
- Volume law scaling of entanglement entropy in spin chains, **CoQuS PhD interviews**, Vienna, Austria, 14-15 June, 2010

Posters

- Spin-squeezing and entanglement for arbitrary spin, **Advances in Foundations of Quantum Mechanics and Quantum Information with atoms and photons**, Torino, Italy, 25-31 May 2014
- Spin-squeezing and entanglement for arbitrary spin, **Bilbao Conference on Entanglement Detection and Quantification**, Bilbao, Spain, 10-13 March, 2014
- Spin-squeezing and entanglement for arbitrary spin, **XVIIth conference on Quantum Information Processing**, Barcelona, Spain, 3-7 February 2014
- Spin-squeezing and entanglement for arbitrary spin, **Quantum Information Processing and Communication International Conference (QIPC2013)**, Florence, Italy, June 30-July 5, 2013
- Entanglement and spin squeezing for arbitrary spin, **Workshop on Quantum Simulations**, Bilbao, Spain, 22-25 October 2012

Schools and Visits

- visit to the group of M. W. Mitchell, ICFO, Barcelona, Spain, 15-19 December 2014
- visit to M. Cramer and M. Plenio at the University of Ulm, Germany, 11-14 November, 2013
- Quantum Frontiers summer school, ICFO, Barcelona, Spain, July 25-July 27, 2013
- visit to the group of Prof. P. Calabrese, Department of Physics, University of Pisa, Italy, December 2012 - March 2013
- Thesis work at the quantum information group (prof. J.I. Latorre), University of Barcelona (UB), Spain, February-October 2009
- Erasmus program, UAB university, Barcelona, Spain, February-October 2009

Grants

- Ph.D grant from SISSA, section Condensed Matter Physics, starting from **November 2010**, (declined)
- Master Thesis grant from the University of Pisa, **February-October 2009**
- Erasmus grant from the University of Pisa, **February-October 2009**

High school scientific competitions

- *Olimpiadi della Matematica (IMO)*: first place at the regional competition and bronze medal at the national competition, (2004)
- *Olimpiadi della Fisica (IPhO)*: first place at the regional competition and participation to the national competition (2003)
- *Olimpiadi della Matematica (IMO)*: second place at the regional competition and participation to the national competition, (2003)
- *Premio E. R. Caianiello*: third place, University of Salerno, (2003)
- *Olimpiadi della Matematica (IMO)*: third place at the regional competition, (2002)
- *Campionati Internazionali di Giochi Matematici*: participation to regional and national competition, Bocconi University (Milan), (2002)