Gianni Tallarita PhD

Personal Data

Place and Date of Birth:	Rome, Italy | 18 January 1987
Address:	Via Del Salvatore 33, Torchiara (SA) 84076, Italia
Phone:	+56 967611496
email:	gianni.tallarita@uai.cl gianni2k@gmail.com

Academic Career

August 2018-present **Associate Professor**

Universidad Adolfo Ibáñez
Santiago, Chile.

August 2015 **Assistant Professor**

Universidad Adolfo Ibáñez
Santiago, Chile.

October 2013 **Post-Doctoral Fellowship**

FONDECYT Post-doctoral Fellowship
Centro de Estudios Cientificos.
Valdivia, Chile.
Universidad de Santiago,
Santiago, Chile.

April 2012 **Post-Doctoral Fellowship**

Advisor: Prof. Fidel Schaposnik

CONICET Post-doctoral Fellowship
Universidad Nacional de La Plata (UNLP).
La Plata, Argentina.

October 2008 **PhD in String Theory**

Queen Mary, University of London, Centre for Research in String Theory. EPSRC funding.

Thesis title: *Aspects of Brane World-Volume Dynamics in String theory.*

Examiners: Prof. Dan Waldram, Dr. Dario Martelli.

Supervisor: Prof. Steven Thomas
Second Supervisor: Dr. David Berman

2007-2008 **Part III Mathematical Tripos (MSc - CASM)**

Certificate of Advanced Studies in Mathematics
Cambridge University DAMTP

Essay Supervisor : Prof. B. Allanach
Essay : *Hunting the Higgs*

A brief introduction to the current theoretical status of the Higgs boson in the MSSM.

2004-2007 **Experimental and Theoretical Physics (BA Hons + MA)**

Natural Sciences Tripos, Cambridge University. Awarded *Cambridge European Trust - Scholarship.*

Academic Referees

Mikhail Shifman **Fine Institute of theoretical Physics, University of Minnesota.**
shifman@umn.edu
TATEH 275-08 (office), 626-0723

Fidel Schaposnik **Universidad Nacional de La Plata**
fschaposnik@gmail.com
fidel@fisica.unlp.edu.ar
(54-221) 423 0122 (int.252)

Steve Thomas **Queen Mary University of London**
s.thomas@qmul.ac.uk
020 7882 5767

Lisa Randall **Harvard University**
randall@physics.harvard.edu
(617) 496-8188

Visiting Research Positions

2020 to 2021 **Universitá Sacro Cuore**

Brescia, Italy
Visiting Researcher

2018 and 2019 **Yamagata University**
Yamagata, Japan
Visiting Researcher project with Dr Minoru Eto

2018 and 2019 **Harvard University**
Boston, MA, USA
Visiting Researcher project with Prof Lisa Randall
David Rockefeller Grant for Latin American Studies

2018 and 2019 **Universitá Sacro Cuore**
Brescia, Italy
Visiting Researcher

July 2017 **University of Toronto**
Toronto, Canada
Visiting Researcher

Feb 2017 **University of Oxford - Rudolf Peierls Centre for Theoretical Physics**
Oxford, UK
Visiting Researcher

July 2016 **Universitá di Pisa - Dipartimento di Fisica**
Pisa, Italy
Visiting Researcher

Apr-May, Oct-Nov 2013 **William I. Fine Theoretical Physics Institute**
University of Minnesota
Minneapolis, MN 55455, USA
Visiting Researcher

Publications and e-prints

- *On the time dependence of holographic complexity for charged AdS black holes with scalar hair* with R.Auzzi, S.Bolognesi, E. Rabinovici and F.I.Schaposnik, JHEP 08 (2022) 235
- *Dynamics of global and local vortices with orientational moduli* with A. Peterson, M. Eto, and F.I.Schaposnik,JHEP 03 (2021) 156
- *Analytic Baby Skyrmions at Finite Density* with M. Barsanti, F. Canfora and S.Bolognesi, Eur.Phys.J.C 80 (2020) 12, 1201
- *Long Way to Ricci Flatness* with J.Chen, C.H Sheu, M. Shifman and A. Yung, JHEP 10 (2020) 059
- *The holographic vortex lattice using the circular cell method* with R.Auzzi, JHEP 2001 (2020) 056
- *Vortons with Abelian and non-Abelian currents and their stability* with S.Bolognesi, A.Peterson and P.Bedford. Eur.Phys.J. C80 (2020) no.1, 38
- *On volume subregion complexity in Vaidya spacetime*, with R.Auzzi, F. Schaposnik, G. Nardelli and N.Zenoni. JHEP 1911 (2019) 098

- *The holographic non-abelian vortex*, with Roberto Auzzi and Adam Peterson, JHEP 1903 (2019) 114.
- *$SU(2)$ Chern-Simons Theory Coupled to Competing Scalars*, with J.P.Ipiña and F. Schaposnik, Phys.Rev. D97 (2018) no.11, 116010.
- *Non-Abelian Vortex Lattices*, with Adam Peterson, Phys.Rev. D97 (2018) no.7, 076003.
- *A Simple Model for a dual non-Abelian monopole-vortex complex*, with Adam Peterson, Phys.Rev. D96 (2017) no.11, 116017.
- *Multi-Skyrmions on $AdS_2 \times S_2$, Rational Maps and Popcorn Transitions*, with Fabrizio Canfora. Nucl.Phys. B921 (2017) 394-410.
- *Multi-Skyrmions with orientational moduli*, with Fabrizio Canfora. Phys.Rev. D94 (2016) no.2, 025037.
- *Visible and hidden sectors in a model with Maxwell and Chern-Simons gauge dynamics* , with Edwin Ireson and Fidel Schaposnik. arXiv:1607.01348.
- *String Pair Production in non homogeneous backgrounds*, with Stefano Bolognesi and Eliezer Rabinovici. JHEP 1604 (2016) 174 .
- *Non-Abelian vortices in Holographic Superconductors*, Phys.Rev. D93 (2016), 066011.
- *Spin vortices in the Abelian-Higgs model with cholesteric vacuum structure*, with Adam Peterson and Mikhail Shifman. Annals Phys. 363 (2015) 515-532
- *Chern-Simons-Higgs Theory with Visible and Hidden Sectors and its $\mathcal{N} = 2$ SUSY Extension*, with Fidel Schaposnik, Paola Arias and Edwin Ireson. Phys.Lett. B749 (2015) 368-373, arXiv:1263168.
- *'t Hooft-Polyakov Monopoles with Non-Abelian Moduli*, with Alexei Yung and Mikhail Shifman, Phys.Rev. D91 (2015) 10, 105026.
- *$SU(N)$ BPS Monopoles in $\mathcal{M}^2 \times S^2$*, with Fabrizio Canfora, Phys.Rev. D91 (2015) 085033.
- *Confining Strings in Supersymmetric Theories with Higgs Branches*, with Alexei Yung and Mikhail Shifman, Phys.Rev. D91 (2015) 065005
- *Low energy dynamics of $U(1)$ vortices in systems with cholesteric vacuum structure*, with Adam Peterson and Mikhail Shifman, Annals Phys. 353 (2014) 48-63
- *Constraining Monopoles by Topology: an Autonomous System*, JHEP 1409 (2014) 136, with Fabrizio Canfora.
- *Holographic Lifshitz Superconductors with an Axion Field*, Phys.Rev. D89 (2014) 106005,
- *More on the Abrikosov String with Non-Abelian Moduli* with Mikhail Shifman and Alexei Yung, Int.J.Mod.Phys. A29 (2014) 1450062
- *Lifshitz Holography with a Probe Yang-Mills Field* with Fidel A. Schaposnik, Physics Letters B 720 (2013) 393Ð398
- *Gauged Lifshitz model with Chern-Simons term* with Fidel A. Schaposnik, G. Lozano, Int.J.Mod.Phys.A Vol 28, Nu. 9
- *AdS Phase Transitions at Finite Kappa*, JHEP 1108 (2011) 048.
- *Maxwell-Chern-Simons Vortices in Holographic Superconductors* with S.Thomas, JHEP:029:1110.
- *Connection Constraints from Non-Abelian Supersymmetric quantum mechanics* , J.Pure Appl.Phys. 4 (2016) no.1, 18-21.
- *Non-Abelian Geometrical Tachyon* with S.Thomas and V.Calo', JHEP:071:0610.

- *Dirac-Born-Infeld actions and Tachyon Monopoles* with S.Thomas and V.Calo', Phys.Rev.D81:086007,2010.
- *Non Abelian Tachyon Kinks* with S.Thomas and V.Calo', JHEP 0908:094,2009.

Teaching Experience

Teaching assistant positions at Queen Mary (QM), Universidad Nacional de La Plata (UNLP) and Universidad Adolfo Ibáñez (UAI).

2019-present CORE science course , UAI.

2015-2018 Ciencias 1 y 2 , UAI.

2013 Fisica 2, 2nd year course, UNLP.
General Relativity, 4th year course, UNLP.

2012 Quantum Mechanics I, 3rd year course, UNLP.
Statistical Mechanics, 4th year course, UNLP.

2012 Quantum Mechanics I, 3rd year course, UNLP.
Quantum Mechanics and Symmetries, 3rd year course. QM
Quantum Physics, 1st year course, QM.

2009 Quantum Mechanics A, First year course. QM.
Electricity and Atomic Physics, Foundation course. QM.
Mathematical Methods I, 1st year course. QM.

2008 Space-Time and Gravity, 2nd and 3rd year course. QM

Supervising Experience

2017 Juan M. P. Ipiña.
Master Thesis - *Non-Abelian Chern- Simons Higgs theory coupled to a scalar field*
Universidad Nacional de La Plata, Argentina
Defense - November 2017.

Academic Book Publications

2022 *Advanced Topics in Quantum Field Theory* - M.Shifman 2nd Edition
Cambridge University Press
Co-author chapter 3.

Seminars

2020 **Holographic Non-Abelian Vortices**
Keio University, Tokyo, Japan.

2018 **Simple models for Non-Abelian Solitons**
Universitá del Sacro Cuore, Brescia, Italy.

2017 **Simple models for Non-Abelian Solitons**
ICTP- Sao Paolo, Brazil.

2015 **Simple models for truly Non-Abelian Solitons**
Universidad Andres Bello, Santiago, Chile.

2015 **Simple models for truly Non-Abelian Solitons**
Universidad Catolica, Santiago, Chile.

2014 **Low Energy Dynamics of Abrikosov Strings with Non-Abelian Moduli**
Universidad de Santiago, Santiago, Chile.

2013 **Aspects of Holographic Superconductivity**
William I. Fine Theoretical Physics Institute, University of Minnesota.

2012 **Gauged Lifshitz Model with a Chern-Simons term**
String Theory, Gravity, and Fields: A journey with Chern and Simons Conference, UBA.

2012 **New insights in the SuperHiggs mechanism from the Goldstino Multiplet**
50th Strings @ Ar Conference, Universidad Buenos Aires.

2010 **Chern-Simons Interactions in Holographic Superconductors**
Max-Planck Institute, Munich

2010 **Chern-Simons Interactions in Holographic Superconductors**
Queen Mary, University of London

2009 **Berry Phase in Non-Abelian Suerpsymmetric Quantum Mechanics**
Queen Mary, University of London

2008 **Non-Abelian Tachyon Kinks**-Queen Mary, University of London

Conferences and Schools

2021 *Wolfram Summer School on Fundamental Physics: Visiting Professor*
Online event

2020 *CP^N model: recent developments and future directions*
Keio University, Tokyo, Japan

2019 *Topological Solitons, Non-perturbative gauge dynamics and confinement*
Pisa, Italy

2017 *Workshop on Solitons: Integrability, Duality and applications*
ICTP Sao Paolo, Brazil

2016 *Holographic theories with anisotropic scaling*
Viña del Mar, Chile

2014 *Quantum Field theory, String theory and Condensed Matter Physics*

Crete

2014 *Mathematica Summer School on Holography*
Lisbon-Porto

2014 *Grav UaCh*
Universidad Austral de Chile

2013 *Trends in Theoretical Physics V*
Universidad Nacional de La Plata

2012 *String Theory, Gravity, and Fields: A journey with Chern and Simons*
Universidad de Buenos Aires

2012 *Introduction to AdS/CFT correspondence*
J. Maldacena, Universidad de Buenos Aires

2009 *CERN Winter School on Supergravity, Strings and Gauge Theories*
CERN, Geneva

2008 *Spring School on Superstring Theory and Related topics*
ICTP, Trieste

Awards, Grants and Outreach Activities

2019 Fondecyt Regular Principal Researcher Grant. 150 000 USD

2019 MIT Collaboration grant with Prof Hong Liu. 10 000 USD

2019 Harvard DRCLAS grant with Prof Lisa Randall. 10 000 USD

2018 Best Young Reasercher award, Universidad Adolfo Ibáñez.

2018 Harvard DRCLAS grant with Prof Lisa Randall. 10 000 USD

2018 Member of the "Grupo de Estudios: Astronomía, cosmología y particulas" Fondecyt.

2016 Fondecyt Iniciacion Research grant 120000 USD, Chilean government.

2016 Best Young Reasercher award, Universidad Adolfo Ibáñez.

2014 Tertulia Public Lecture on physics, CECs Valdivia.

2014 Physics lecturer for visiting high-schools, CECs Valdivia.

2010 Book on D-Branes and Tachyons in String theory. Amazon ISBN: 3847306863

Academic Referee

Academic referee for Physical Review and Physical Letters.

Non-Academic Work Experience

June 2008 **Summer Intern: Bank of America, Technology Division.**

Bank of America Merrill Lynch, Financial Centre, 2 King Edward Street, London, EC1A 1HQ.

Contact Reference: Satya Gorthy, satya.gorthy@gmail.com, 07711 481777.

During the internship I followed courses on Capital Markets and the City. I spent eight weeks in the technology team supporting the equity derivatives trading team and two more shadowing the Quantitative analyst team. Through this experience I have become comfortable working in a team, working under systematic time pressure and in close contact with traders. I assisted regular business meetings within our department and contributed actively by presenting projects in both Excel and C++.

June 2006 **Systems Engineer: UltraElectronics.**

UltraElectronics Limited. Controls. Vitrum Building, St John's Innovation Park, Cowley Road, Cambridge, CB4 0WS

Contact Reference: Dr. Lewis Rees, projectx.loz@gmail.com, 07779123179.

Worked as a systems engineer assigned to the mechanical and electrical testing of the Tunable Vibration Absorber (TVA) system mounted on military cargo and passenger aircraft. Involved in the engineering of the anti-ice mechanism on aircraft wings for major aircraft companies such as Airbus and Boeing. Operated within a team and played an important role in client meetings.

Programming expertise

- Expert level in Wolfram Language dedicated to numerical modelling of differential equations and neural networks.
- Intermediate experience in Python Language.
- Advanced experience in COMSOL MultiPhysics.

Skills and Interests

- Native level in three languages, both written and spoken: **Italian**, **English** and **Spanish**. Also fluent in **French**.
- Full UK driving license. Licensed lifeguard. Full Sailing License.