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# GIANNI TALLARITA PhD



## PERSONAL DATA

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PLACE AND DATE OF BIRTH: Rome, Italy | 18 January 1987  
ADDRESS: Via Del Salvatore 33, Torchiara (SA)  
84076, Italia  
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EMAIL: [gianni.tallarita@uai.cl](mailto:gianni.tallarita@uai.cl)  
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WEBPAGE: <https://giannitallarita.github.io>

## ACADEMIC CAREER

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MARCH 2023-present **Masters Diploma in Data Science**

Universidad Adolfo Ibáñez  
Santiago, Chile.

MARCH 2023 **Certified Microsoft Azure Data Science Associate**

Online examination

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 Científicos.  
Valdivia, Chile.  
Universidad de Santiago,  
Santiago, Chile.

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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.*

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## NON-ACADEMIC WORK EXPERIENCE

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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.

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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

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- Certified Microsoft Azure Cloud Computing Data Science Associate.
- Expert experience in Python Language, including libraries such as Numpy, Sci-kit, Cupy, Pandas.
- Expert level in Wolfram Language dedicated to numerical modeling of differential equations and neural networks.
- Advanced experience in COMSOL MultiPhysics.

## ACADEMIC REFEREES

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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

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## VISITING RESEARCH POSITIONS

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2020 TO 2021	<b>Università Sacro Cuore</b> Brescia, Italy Visiting Researcher
2018 AND 2019	<b>Yamagata University</b> Yamagata, Japan Visiting Researcher project with Dr Minoru Eto
2018 AND 2019	<b>Harvard University</b> Boston, MA, USA Visiting Researcher project with Prof Lisa Randall David Rockefeller Grant for Latin American Studies
2018 AND 2019	<b>Università Sacro Cuore</b> Brescia, Italy Visiting Researcher
JULY 2017	<b>University of Toronto</b> Toronto, Canada Visiting Researcher
FEB 2017	<b>University of Oxford - Rudolf Peierls Centre for Theoretical Physics</b> Oxford, UK Visiting Researcher
JULY 2016	<b>Università di Pisa - Dipartimento di Fisica</b> Pisa, Italy Visiting Researcher
APR-MAY, OCT-NOV 2013	<b>William I. Fine Theoretical Physics Institute</b> University of Minnesota Minneapolis, MN 55455, USA Visiting Researcher

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## PUBLICATIONS AND E-PRINTS

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- *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 001 (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

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- *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) 393-398
  - *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.

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- *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

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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

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- 2022    Martin Onetto  
PhD Thesis - Co-Supervisor  
Instituto Balseiro, Argentina  
Ongoing.
- 2019    Isai Emanuel Davila Cuba  
Master Thesis - *Modelo Abelian de Higgs*  
Universidad Nacional de La Plata, Argentina  
Defense - November 2019.
- 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.

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## ACADEMIC BOOK PUBLICATIONS

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

## SEMINARS

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- 2020 **Holographic Non-Abelian Vortices**  
Keio University, Tokyo, Japan.
- 2018 **Simple models for Non-Abelian Solitons**  
Università 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

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

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- 2020 *CP<sup>N</sup> 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

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- 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.



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- 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

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Academic referee for Physical Review and Physical Letters.

## SKILLS AND INTERESTS

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