

Fabio Ferrari Ruffino

Assistant professor - Mathematics Department

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Personal details

Date of birth:	December 15, 1981	Citizenship	Italian
Place of birth:	Brescia, Italy	Languages	Italian, English, Portuguese, Spanish

Education

Aug 2010–Jan 2013	FAPESP Post-doctoral fellowship , ICMC - Universidade de São Paulo, São Carlos - SP, Brazil.
Nov 209–Dec 209	Research fellowship , SISSA, Trieste.
Nov 2005–Oct 2009	Ph. D. in Mathematical Physics , SISSA, Trieste. Thesis: <i>“Topics on topology and superstring theory”</i> , Advisors: Prof. Lorian Bonora, Prof. Ugo Bruzzo; arXiv:0910.4524
Oct 2003–Jun 2005	Diploma in Mathematics , Scuola Normale Superiore, Pisa. Advisor: Prof. Fulvio Ricci.
Oct 2003–Jun 2005	Second level undergraduate degree (Laurea specialistica) in Mathematics , Università degli Studi di Pisa, Pisa. Thesis: <i>“Gelfand pairs”</i> , final mark: 110/110 cum laude, Advisor: Prof. Fulvio Ricci. 13 exams taken, average mark: 30/30, 12 cum laude.
Oct 2000–Sep 2003	First level undergraduate degree (Laurea triennale) in Mathematics , Università degli Studi di Milano, Milan. Thesis: <i>“Stokes theorem and applications”</i> , final mark: 110/110 cum laude, Advisor: Prof. Massimo Tarallo. 23 exams taken, average mark: 30/30, 20 cum laude.

Employment history

Feb 2013–Now	Assistant professor , Mathematics Department – Universidade Federal de São Carlos, São Carlos - SP, Brasil.
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Research interests

Algebraic and differential topology, in particular differential cohomology theories. Applications in mathematical physics, especially in string theory.

Publications and preprints

- 2018 F. Ferrari Ruffino and Juan Carlos Rocha Barriga, *Relative differential cohomology and generalized Cheeger-Simons characters*, accepted for publication on Communications in Analysis and Geometry, arXiv:1811.07035
- 2015 F. Ferrari Ruffino, *Flat pairing and generalized Cheeger-Simons characters*, Journal of Homotopy and Related Structures, DOI 10.1007/s40062-015-0124-9; arXiv:1208.1288
- 2015 F. Ferrari Ruffino, *Differential K-characters and D-branes*, Proceedings of String-Math 2014, in Proceedings of Symposia in Pure Mathematics, Volume 93, 2016; arXiv:1603.05323
- 2014 F. Ferrari Ruffino, *Relative differential cohomology*, Journal of Homotopy and Related Structures (2015) 10:923–937, DOI 10.1007/s40062-014-0088-1; arXiv:1401.1029
- 2013 F. Ferrari Ruffino, *Relative Deligne cohomology and Cheeger-Simons characters*, Communications in analysis and geometry, Volume 22, Number 3, 573–593, 2014; arXiv:1401.0631
- 2012 F. Ferrari Ruffino, *Freed-Witten anomaly and D-brane gauge theories*, Proceedings of String-Math 2011, in Proceedings of Symposia in Pure Mathematics, Volume 85 (2012) pp. 433–441; arXiv:1104.2798
- 2012 F. Ferrari Ruffino, *Classifying A-field and B-field configurations in the presence of D-branes - Part II: Stacks of D-branes*, Nuclear Physics, Section B 858 (2012), pp. 377–404; arXiv:1104.2798
- 2009 F. Ferrari Ruffino, *Topics on the geometry of D-brane charges and Ramond-Ramond fields*, JHEP 11 (2009) 012; arXiv:0909.0689
- 2009 L. Bonora, F. Ferrari Ruffino and R. Savelli, *Revisiting pinors and orientability*, Bollettino U.M.I. (9) IV (2012); arXiv:0907.4334
- 2009 F. Ferrari Ruffino, *Gysin map and Atiyah-Hirzebruch spectral sequence*, Bollettino U.M.I. (9) IV (2011); arXiv:0904.4103
- 2008 L. Bonora, F. Ferrari Ruffino and R. Savelli, *Classifying A-field and B-field configurations in the presence of D-branes*, JHEP 12 (2008) 078; arXiv:0810.4291
- 2008 F. Ferrari Ruffino and R. Savelli, *Comparing two different K-theoretical classifications of D-branes*, Journal of Geometry and Physics 61 (2011) pp. 191–212; arXiv:0805.1009
- 2006 F. Ferrari Ruffino, *The topology of the spectrum for Gelfand pairs on Lie groups*, Bollettino U.M.I. (8) 10-B (2007), 569–579; arXiv:0706.0708
- 2005 F. Ferrari Ruffino, *Coppie di Gelfand*, master thesis (in Italian), available in the website <http://etd.adm.unipi.it/theses/available/etd-06062005-090954/unrestricted/tesi.pdf>

Published books

- 2013 F. Ferrari Ruffino, *Topics on topology and superstring theory*, Ph. D. Thesis, LAP LAMBERT Academic Publishing, ISBN 978-3-659-36834-9.

Research grants

Jul 2014–Jun 2018 **Auxílio à pesquisa – Jovem Pesquisador**, Fapesp, DM – UFSCar.

Students and post-docs

SUPERVISED

Mar 2015 – Mar 2016 **Murilo Barbosa Alves**, Bachelor student with one-year fellowship *Young talents for science*, Physics department – UFSCar.

2014–2017 **Juan Carlos Rocha Barriga**, Ph. D. , Mathematics department – UFSCar.

Jun 2016 – May 2018 **Murilo Barbosa Alves**, Bachelor student with two-year Fapesp fellowship, Physics department – UFSCar.

2016–2018 **Julien Korinman**, Post-doc PNPd–CAPES, Mathematics department – UFSCar.

2017–2018 **Rodrigo Pires dos Santos**, Post-doc PNPd–CAPES, Mathematics department – UFSCar.

2018 **Gabriel Longatto Clemente**, Bachelor student with one-year Fapesp fellowship, Mathematics department – UFSCar.

UNDER SUPERVISION

Juan Carlos Rocha Barriga, Post-doc, Mathematics department – UFSCar.

Juan Carlos Nuñez Maldonado, Ph. D. student, Mathematics department – UFSCar.

Brenno Gustavo Barbosa, Ph. D. student, Mathematics department – UFSCar.

Alffer Gustavo Hernandez Posada, Ph. D. student, Mathematics department – UFSCar.

Gabriel Longatto Clemente, Bachelor student with Fapesp fellowship, Mathematics department – UFSCar.

Talks, courses and posters

Jun 2018 **Talk: “Relative differential cohomology and generalized Cheeger-Simons characters”**, International Conference on Manifolds, Groups and Homotopy, Skye (Scotland).

Jun 2018 **Talk: “Twisted differential K-characters and D-branes”**, VI Workshop on Poisson Geometry and Related Topics, ICMC - USP, São Carlos (Brazil).

Feb 2018 **Poster: “Relative differential cohomology and Cheeger-Simons characters”**, 20th School of Differential Geometry, João Pessoa (Brazil).

Feb 2018 **Mini-course: “Introduction to differential cohomology”**, II Patricio Letelier School on Mathematical Physics, ICMC - USP, São Carlos (Brazil).

May 2016 **Talk: “Generalized Cheeger-Simons characters and D-branes”**, Institut de Physique Théorique - Saclay, Paris (France).

- May 2016 **Talk: "Charge quantization and generalized cohomology theories"**, Coloquio MAP, IME - USP, São Paulo, SP (Brazil).
- Sep 2014 **Poster: "Flat pairing and differential homology"**, Workshop on Special Geometric Structures in Mathematics and Physics, Universität Hamburg, Hamburg (Germany).
- Jun 2014 **Talk: "Differential homology and D-branes"**, String-Math 2014, University of Alberta, Edmonton (Canada).
- Feb 2014 **Talk: "Relative differential cohomology"**, Workshop on Topology and dynamics, UFF, Rio de Janeiro, RJ (Brazil).
- Oct 2013 **Talk: "Short history of non-euclidean geometries"**, DM - UFSCar, São Carlos, SP (Brazil).
- Jul 2013 **Talk: "Differential cohomology in mathematical physics"**, DM - UFSCar, São Carlos, SP (Brazil).
- May 2013 **Talk: "Differential cohomology and mathematical physics"**, Mini-workshop on Poisson geometry and related topics, IMPA, Rio de Janeiro, RJ (Brazil).
- May 2013 **Talk: "Short introduction to mathematical physics and string theory"**, DM - UFSCar, São Carlos, SP (Brazil).
- Apr 2013 **Talk: "Short introduction to mathematical physics and string theory"**, DM - UFSCar, São Carlos, SP (Brazil).
- Dec 2012 **Talk: "Differential homology and applications to string theory"**, Christmas Workshop on Moduli Spaces and Integrable Systems, Genova (Italy).
- Oct 2012 **Talk: "Dirac monopole and Aharonov-Bohm effect from the topological viewpoint"**, ICMC - USP, São Carlos, SP (Brazil).
- Sep-Oct 2012 **Mini-course: "K-theory and Atiyah-Singer index theorem"**, ICMC - USP, São Carlos, SP (Brazil).
- Jul 2012 **Talk: "Differential homology"**, Encontro italo-brasileiro de geometria 2012, Salvador de Bahia (Brazil).
- Jul 2012 **Poster: "Flat pairing and differential homology"**, String-Math 2012, Bonn (Germany).
- Jul 2011 **Talk: "Freed-Witten anomaly and D-brane gauge theories"**, SISSA, Trieste (Italy).
- Jun 2011 **Talk: "Freed-Witten anomaly and D-brane gauge theories"**, String-Math 2011, Philadelphia (USA).
- Nov 2010 **Talk: "Non-integral bundles and gerbes"**, Campinas - SP (Brazil).
- Oct 2010 **Talk: "Non-integral bundles and gerbes"**, Workshop on Topology, Brotas - SP (Brazil).
- Jul 2009 **Talk: "Spinors and orientability"**, 2nd Workshop on Geometric Methods in Theoretical Physics, Trieste (Italy).
- Sep 2008 **Talk: "Freed-Witten anomaly and D-branes gauge theory"**, Workshop on algebraic geometry and physics, Hangzhou (China).
- Sep 2008 **Talk: "K-theory and D-brane charges"**, School and workshop on the geometry of algebraic stacks, Trento (Italy).
- Jul 2008 **Mini-talk: "K-theory and D-branes: Sen's conjecture"**, Eurostrings, Amsterdam (Netherlands).

- May 2006 **Talk: “The topology of the spectrum for Gelfand pairs on Lie groups”**, Italian meeting of harmonic analysis, Cortona (Italy).
- Dec 2004 **Talk: “Gelfand pairs: theory and examples”**, Scuola Normale Superiore, Pisa (Italy).

Other activities

- 2012–Now MathSciNet reviewer.
- 2013 Referee for the journal *SIGMA* (Symmetry, Integrability and Geometry: Methods and Applications).
- 2017 Referee for the journal *Communications in Analysis and Geometry*.
- 2019 Referee for the journal *Advances in Mathematics*.

Participation in schools and congresses

- Jun 2018 **International Conference on Manifolds, Groups and Homotopy**, Skye (Scotland).
- Jun 2018 **VI Workshop on Poisson Geometry and Related Topics**, ICMC - USP, São Carlos (Brazil).
- Feb 2018 **20th School of Differential Geometry**, João Pessoa (Brazil).
- Feb 2018 **II Patricio Letelier School on Mathematical Physics**, ICMC - USP, São Carlos (Brazil).
- Sep 2014 **Workshop on Special Geometric Structures in Mathematics and Physics**, Universität Hamburg, Hamburg (Germany).
- May 2014 **String–Math 2014**, University of Alberta, Edmonton (Canada).
- Feb 2014 **Workshop on topology and dynamics**, UFF, Rio de Janeiro, RJ (Brazil).
- May 2013 **Mini-workshop on Poisson geometry and related topics**, IMPA, Rio de Janeiro (Brazil).
- Dec 2012 **Christmas Workshop on Moduli Spaces and Integrable Systems**, Genova (Italy).
- Jul 2012 **Encontro italo-brasileiro de geometria 2012**, Salvador de Bahia (Brazil).
- Jul 2012 **String-Math 2012**, Bonn (Germany).
- May 2012 **Algebraic topology, field theory and strings**, Stony Brook (USA).
- Aug 2011 **Simons Summer Workshop**, Stony Brook (USA).
- Jun 2011 **String-Math 2011**, Philadelphia (USA).
- Oct 2010 **Workshop on Topology**, Brotas - SP (Brazil).
- Jul 2009 **2nd Workshop on Geometric Methods in Theoretical Physics**, Trieste (Italy).
- Sep 2008 **Workshop on algebraic geometry and physics**, Hangzhou (China).
- Sep 2008 **School and workshop on the geometry of algebraic stacks**, Trento (Italy).
- Jul 2008 **Eurostrings**, Amsterdam (Netherlands).
- Jun 2008 **Vector Bundles**, Madrid (Spain).
- Dec 2007 **Avogadro meeting**, Alessandria (Italy).

- Sep 2007 **Summer school in mathematical physics**, Modave (Belgium).
- Jun 2007 **Workshop on algebraic geometry and physics**, Korean Institute for Advanced Studies, Seoul (South Korea).
- Jun 2007 **College on Mirror symmetry**, Chern Institute of Mathematics, Nankai University, Tianjin (China).
- Apr 2007 **Workshop on derived categories, non-commutative geometry and strings**, Hamilton Mathematics Institute – Trinity College, Dublin (Ireland).
- May 2006 **Italian meeting of harmonic analysis**, Cortona (Italy).
- Apr 2005 **Short course on Euclidean harmonic analysis**, Edinburgh (Scotland, UK).

São Carlos, November 20th, 2018