CURRICULUM VITÆ

Oliver Fabio Piattella

Professor Associado (Reader, Associate Professor)
Level 2 CNPq Researcher

PERSONAL DETAILS

• Permanent Address: Physics Department, Federal University of Espírito Santo, Avenida Fernando Ferrari 514, Vitória 29075-910, Brazil
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• Web page: `http://ofp.cosmo-ufes.org/`

• Date of birth: 17.09.1981
• Place of birth: Zürich, Switzerland
• Nationality: Italian
• Family Status: Married

RESEARCH INTERESTS AND COLLABORATIONS

• Cosmology, Gravitation and Astrophysics.
• Dark Matter and Large Scale Structure.
• Dark Energy and Modified Gravity.
• Gravitational Lensing.

EDUCATION AND EMPLOYMENT HISTORY

• September 2018–February 2020. CAPES-Humboldt fellow. Institut for Theoretical Physics, Heidelberg University, Germany;
• February 2012–present. Lecturer (*Professor Adjunto IV*). Federal University of Espírito Santo, Brazil;
• February 2011–February 2012. Visiting Professor. Federal University of Espírito Santo, Brazil;
• February 2010–February 2011. Post-Doctoral fellow. Federal University of Espírito Santo, Brazil;
• Spring–Summer 2009. Visiting Researcher. Institute of Cosmology and Gravitation, Portsmouth, UK.
• January 2007–January 2010. PhD student. Università degli Studi dell'Insubria, Como, Italy.

GRANTS, AWARDS AND PRIZES

• CAPES (Brazil) and Humboldt (Germany) fellowship. Awarded in June 2018 for 18 months starting from September 2018.
• FAPES (Espírito Santo Foundation for Supporting Research, Brazil) Research Grant (*Taxa de Pesquisa*), awarded March 2016 (three-year support, total value BRL21,600)

• CNPq (National Counsel of Technological and Scientific Development, Brazil) Research Grant (*Produtividade em Pesquisa*), awarded January 2016 (three-year support, total value BRL39,600)
• UFES. International cooperation call, awarded September 2014 for exchange visits with the ICG, Portsmouth, UK (two-year support, value BRL30,000)
• CNPq. Research Grant (*Produtividade em Pesquisa*), awarded January 2013 (three-year support, value BRL39,600)
• CNPq. Post-doctoral Fellowship, awarded January 2010 (one-year support, value BRL43,200);
• Università degli Studi dell'Insubria, Como, Italy. PhD fellowship awarded October 2006 (three years support, value EUR36,000);

TALKS AND LECTURES

• July 2019, *Lectures on the cosmological constant*, two invited lectures at the Institute of Theoretical Physics of the Heidelberg University
• December 2018, *The effect of the cosmological constant on the bending of light*, cosmology group seminar at the Institute of Theoretical Physics of the Heidelberg University
• July 2018, *Introduction to Gravitational Waves*, series of 3 lectures delivered at the *Inverno Astrofísico 2018*
• June 2018, *Estate Quantistica*, Scalea, Italy. Title: *Stability of neutron stars in R^2 gravity*
• July 2017, *Introduction to Cosmology*, series of 3 lectures delivered at the *The Fourth Afro-Franco-Brazilian Meeting on Mathematics and Physics*
• April 2017, *Introduction to Cosmology*, series of 3 lectures delivered at the *First school on physical sciences Brazil-Cape Verde*
• July 2016, *Xth International Cconference on the interconnection between particle physics and cosmology*, São Paulo, Brazil. Title: *Lensing in the McVittie metric*
• September 2015, ICG theory group seminar, Portsmouth, UK. Title: *Lensing in the McVittie metric*
• February 2015, *Verão Quântico*, João Pessoa, Brazil. Title: *Velocity dispersion effect on the evolution of small fluctuations of dark matter*
• September 2014, *Estate Quantistica*, Scalea, Italy. Title: *Velocity dispersion effect on the evolution of small fluctuations of dark matter*
• May 2013, Nice Observatory, France. Title: *Velocity dispersion effects in the linear growth of cosmic structures*
• May 2013, Institute of Astrophysics, Paris, France. Title: *Velocity dispersion effects in the linear growth of cosmic structures*
• October 2010, Brazilian Centre for Research in Physics (CBPF), Rio de Janeiro, Brazil. Title: *Causal Bulk Viscous Cosmology*
• July 2009, Institute of Astronomy (IoA), Cambridge, UK. Title: *A new class of adiabatic Unified Dark Matter models*
• February 2009, Institute of Cosmology and Gravitation (ICG), UK. Title: *The Chaplygin gas as a unified model of dark energy and dark matter*
• March 2008, University of Bologna, Italy. Title: *Gauge-invariant analysis of perturbations in Chaplygin gas unified models of dark matter and dark energy*

TEACHING

Since August 2010 I teach two 60-hours courses per semester (the weekly teaching hours are typically 8).

I have been teaching all the basic physics courses for undergraduates since August 2010. I regularly teach Cosmology and General Relativity to graduate students since 2014.

I also teach in the Distance Learning modality via a *Moodle* web-based platform.

STUDENTS SUPERVISION

I have completed supervisions of 6 BSc, 5 MSc, and 3 PhD students. I am currently supervising 1 PhD student (Leonardo Giani) and co-supervising another 2 PhD students.

Together with my colleagues we created the PPGCosmo (`http://ppgcosmo.cosmo-ufes.org/`) PhD program, in August 2016. This is a new PhD course which I contributed to create in 2016 and which is based on the internationalization of its students. Each of them is co-supervised by one of our international partners, who for now are Scott Dodelson (Carnegie Mellon), Luca Amendola (Heidelberg), David Wands (ICG, Portsmouth) and Jos Pacheco (OCA, France).

JOURNAL REFEREE

- Physics of the Dark Universe;
- General Relativity and Gravitation (GERG);
- Monthly Notices of the Royal Astronomical Society (MNRAS);
- Physical Review D (PRD);
- Journal of Cosmology and Astroparticle Physics (JCAP);
- European Journal of Physics C (EJPC);
- Classical and Quantum Gravity (CQG);

EVENTS ORGANISED

The web-pages of the following events can be found on `http://www.cosmo-ufes.org/events.html`. Typically, I have been able to win financial support of about 10,000 BRL for each of the below listed event from the local funding agency (FAPES, Espírito Santo, Brazil) and from the two federal ones (CNPq and CAPES, Brazil). This financial support was necessary in order to pay travel expenses and accommodations of the invited speakers.

- June 2018: *Estate Quantistica 2018*, Scalea, Italy.
- June 2018: *Homage to Winfried Zimdahl's 70th birthday*, Vitória, Brazil.
- October 2017: *Homage to Júlio César Fabris's 60th birthday*, Vitória, Brazil.
- March 2017: *Seventh Verão Quântico*, Anchieta, Brazil.
- September 2016: *Third José Plínio Baptista School in Gravitation and Cosmology*, Pedra Azul, Domingos Martins, Brazil.
- June 2016: *Estate Quantistica*, Scalea, Italy.
- February 2016: *Patrício Letelier School in Mathematical Physics*, Ubu, Anchieta,

Brazil.
• April 2015: *Black holes and their analogues*, Ubu, Anchieta, Brazil.
• February 2015: *Sixth Verão Quântico*, João Pessoa, Brazil.
• September 2014: *Estate Quantistica*, Scalea, Italy.
• March 2014: *Second José Plínio Baptista School in Gravitation and Cosmology*, Pedra Azul, Domingos Martins, Brazil.
• February 2013: *Fifth Verão Quântico*, Ubu, Anchieta, Brazil.
• October 2012: *First José Plínio Baptista School in Gravitation and Cosmology*, Ubu, Anchieta, Brazil.
• February 2012: *Quantum Field Theory and Quantum Gravity: A workshop in homage to Professor Olivier Piguet's 70th birthday*, Ubu, Anchieta, Brazil.

GENERAL SKILLS

• Computer Literacy:
Fortran 77/90/95, Mathematica, Maple, Matlab, CAMB, CMBFAST, CLASS, Moodle;
• Languages (with classification according to the Common European Framework of Reference for Languages):
Italian (mother tongue, C2), English (C2), Portuguese (C2), French (C1), Spanish (C1), German (B2), Russian (A2), Japanese (A1).

ADMINISTRATIVE RESPONSIBILITIES

• I have been coordinator of the distance learning course in physics of UFES in the period March 2016-March 2018;
• Vice-director of the PPGCosmo PhD course (2016-2018).

LIST OF PUBLICATIONS

Articles published in international scientific journals

1. V. Gorini, A. Y. Kamenshchik, U. Moschella, O. F. Piattella and A. A. Starobinsky, *Gauge-invariant analysis of perturbations in Chaplygin gas unified models of dark matter and dark energy*, JCAP **0802** (2008) 016, arXiv:0711.4242

2. V. Gorini, A. Y. Kamenshchik, U. Moschella, O. F. Piattella and A. A. Starobinsky, *More about the Tolman-Oppenheimer-Volkoff equations for the generalised Chaplygin gas*, Phys. Rev. D **80**, 104038 (2009), arXiv:0909.0866

3. O. F. Piattella, *The extreme limit of the generalised Chaplygin gas*, JCAP **1003** (2010) 012, arXiv:0906.4430

4. O. F. Piattella, D. Bertacca, M. Bruni and D. Pietrobon, *Unified Dark Matter models with fast transition*, JCAP **1001** (2010) 014, arXiv:0911.2664

5. L. Rizzi, S. L. Cacciatori, V. Gorini, A. Y. Kamenshchik and O. F. Piattella, *Dark matter effects in vacuum spacetime*, Phys. Rev. D **82**, 027301 (2010), arXiv:1006.4059

6. L. Rizzi, O. F. Piattella, S. L. Cacciatori and V. Gorini, *The Step-Harmonic potential*, Am. J. Phys. **78**, 8, August 2010, arXiv:0912.3198

7. D. Bertacca, O. F. Piattella, M. Bruni and D. Pietrobon, *Unified Dark Matter scalar field models with fast transition*, JCAP **02** (2011) 018, arXiv:1011.6669

8. F. Belgiorno, S. L. Cacciatori, F. Dalla Piazza and O. F. Piattella, *Quantum loss of angular momentum for BTZ black holes*, J. Phys. A **44** (2011) 025202, arXiv:1007.4439

9. Daniele Bertacca, Alvise Raccanelli, Oliver F. Piattella, Davide Pietrobon, Nicola Bartolo, Sabino Matarrese and Tommaso Giannantonio, *CMB-Galaxy correlation in Unified Dark Matter Scalar Field Cosmologies*, JCAP **1103** (2011) 039, arXiv:1102.0284

10. Oliver F. Piattella, Júlio C. Fabris and Winfried Zimdahl, *Bulk viscous cosmology with causal transport theory*, JCAP **1105** (2011) 029, arXiv:1103.1328

11. L. Rizzi, O. F. Piattella, S. L. Cacciatori and V. Gorini, *Two variants of the step-harmonic potential*, Revista Brasileira de Ensino de F sica, vol. 38, no 2, e2302 (2016), arXiv:1102.2994

12. Oliver F. Piattella and Daniele Bertacca, *Gravitational potential evolution in Unified Dark Matter Scalar Field Cosmologies: an analytical approach*, Modern Physics Letters **A26** (2011) 2277-2286, arXiv:1103.0234

13. J. C. Fabris, T. C. C. Guio, M. Hamani Daouda, O. F. Piattella, *Scalar models for the generalized Chaplygin gas and the structure formation constraints*, Gravitation and Cosmology **17** 3 (2011) 259–271, arXiv:1011.0286

14. A. A. Grib, Y. .V. Pavlov, O. F. Piattella, *High energy processes in the vicinity of the Kerr's black hole horizon*, International Journal of Modern Physics A, **26** (2011) 22, arXiv:1105.1540

15. J. C. Fabris, M. Hamani Daouda, O. F. Piattella, *Note on the Evolution of the Gravitational Potential in Rastall Scalar Field Theories*, Phys. Lett. **B711** (2012) 232-237, arXiv:1109.2096

16. M. J. S. Houndjo and O. F. Piattella, *Reconstructing $f(R,T)$ gravity from holographic dark energy*, International Journal of Modern Physics D, **21** (2012) 1250024, arXiv:1111.4275

17. C. E. M. Batista, M. H. Daouda, J. C. Fabris, O. F. Piattella and D. C. Rodrigues, *Rastall Cosmology and the ΛCDM Model*, Phys. Rev. **D85** (2012) 084008, arXiv:1112.4141

18. M. J. S. Houndjo, C. E. M. Batista, J. P. Campos and O. F. Piattella, *Finite-time singularities in f(R, T) gravity and the effect of conformal anomaly*, Can. J. Phys. 91 (7), 548-553 (2013), arXiv:1203.6084

19. C. E. M. Batista, J. C. Fabris, O. F. Piattella and A. M. Velasquez-Toribio, *Observational constraints on Rastall's cosmology*, Eur. Phys. J. C73 (2013) 2425, arXiv:1208.6327

20. G. F. Silva, O. F. Piattella, J. C. Fabris, L. Casarini and T. O. Barbosa, *Bouncing solutions in Rastall's theory with a barotropic fluid,* Grav. Cosmol. 19 (2013) 156-162, arXiv:1212.6954

21. J. P. Campos, J. C. Fabris, R. Perez, O. F. Piattella and H. Velten, *Does Chaplygin gas have salvation?,* Eur. Phys. J. C73 (2013) 2357, arXiv:1212.4136

22. O. F. Piattella, D. C. Rodrigues, J. C. Fabris, J. A. de Freitas Pacheco, *Evolution of the phase-space density and the Jeans scale for dark matter derived from the Vlasov-Einstein equation*, JCAP 1311 (2013) 002, arXiv:1306.3578

23. J. C. Fabris, O. F. Piattella, I. G. Salako, J. Tossa, H. E. S. Velten, *A note on acoustic black holes in neo-Newtonian theory*, Mod.Phys.Lett. A28 (2013) 1350169, arXiv:1308.1859

24. O. F. Piattella, J. C. Fabris, N. Bilić, *Note on the thermodynamics and the speed of sound of a scalar field*, Class.Quant.Grav. 31 (2014) 055006, arXiv:1309.4282

25. J. C. Fabris, J. A. de Freitas Pacheco, O. F. Piattella, *Is the continuous matter creation cosmology an alternative to ΛCDM?*, JCAP 1406 (2014) 038, arXiv:1405.6659

26. L. Casarini, O. F. Piattella, S. Bonometto and M. Mezzetti, *Sample variance in N–body simulations and impact on tomographic shear predictions*, Astrophys.J. 812 (2015) no.1, 16, arXiv:1406.5374

27. O. F. Piattella, D. L. A. Martins and L. Casarini, *Sub-horizon evolution of cold dark matter perturbations through dark matter-dark energy equivalence epoch*, JCAP **1410** (2014) 10, 031, arXiv:1407.4773

28. T. R. P. Caramês, M. H. Daouda, J. C. Fabris, A. M. Oliveira, O. F. Piattella and V. Strokov, *The Brans-Dicke-Rastall theory*, Eur. Phys. J. C **74** (2014) 11, 3145, arXiv:1409.2322

29. D. C. Rodrigues, B. Chauvineau and O. F. Piattella, *Scalar-Tensor gravity with system-dependent potential and its relation with Renormalization Group extended General Relativity*, JCAP **1509** (2015) no.09, 009, arXiv:1504.05119

30. O. F. Piattella, L. Casarini, J. C. Fabris and J. A. d. F. Pacheco, *Dark matter velocity dispersion effects on CMB and matter power spectra*, JCAP **1602** (2016) no.02, 024, arXiv:1507.00982

31. O. F. Piattella, *Lensing in the McVittie metric*, Phys. Rev. D **93** (2016) no.2, 024020, arXiv:1508.04763

32. R. M. Barbosa, E. G. Chirinos Isidro, W. Zimdahl and O. F. Piattella, *Cosmic bulk viscosity through backreaction*, Gen. Rel. Grav. **48** (2016) no.4, 51, arXiv:1512.07835

33. P. O. Baqui, J. C. Fabris and O. F. Piattella, *Cosmology and stellar equilibrium using Newtonian hydrodynamics with general relativistic pressure*, JCAP **1604** (2016) no.04, 034, arXiv:1512.09056

34. A. O. F. de Almeida, O. F. Piattella and D. C. Rodrigues, *A method for evaluating models that use galaxy rotation curves to derive the density profiles*, Mon. Not. Roy. Astron. Soc. **462** (2016) 270, arXiv:1605.04269

35. K. A. Bronnikov, J. C. Fabris, O. F. Piattella and E. C. Santos, *Static, spherically symmetric solutions with a scalar field in Rastall gravity*, Gen. Rel. Grav. **48** (2016) no.12, 162, arXiv:1606.06242

36. E. G. C. Isidro, R. M. Barbosa, O. F. Piattella and W. Zimdahl, *Averaged Lemaître-Tolman-Bondi dynamics*, Class. Quant. Grav. **34** (2017) no.3, 03500, arXiv:1608.00452

37. O. F. Piattella, *On the effect of the cosmological expansion on the gravitational lensing by a point mass*, Universe 2016, 2(4), 25, arXiv:1609.00270

38. K. A. Bronnikov, J. C. Fabris, O. F. Piattella, D. C. Rodrigues and E. C. Santos, *Duality between k-essence and Rastall gravity*, Eur. Phys. J. C **77** (2017) no.6, 409, arXiv:1701.06662

39. O. F. Piattella and L. Giani, *Redshift drift of gravitational lensing*, Phys. Rev. D **95** (2017) no.10, 101301, arXiv:1703.05142

40. T. Miranda, J. C. Fabris and O. F. Piattella, *Reconstructing a $f(R)$ theory from the α-Attractors*, JCAP **1709** (2017) no.09, 041, arXiv:1707.06457

41. F. Sbisà, O. F. Piattella and S. E. Jorás, *Pressure effects in the weak-field limit of $f(R) = R+\alpha R^2 gravity$*, Phys. Rev. D **99** (2019), 104046, arXiv:1811.01322

42. T. Miranda, C. Escamilla-Rivera, O. F. Piattella and J. C. Fabris, *Generic slow-roll and non-gaussianity parameters in $f(R)$ theories*, JCAP **1905** (2019) 028, arXiv:1812.01287

43. I. Torres, J. C. Fabris and O. F. Piattella, *Classical and quantum cosmology of Fab Four John theories*, Phys. Lett. B **798**, 135003 (2019) arXiv:1811.08852

44. L. Giani, T. Miranda and O. F. Piattella, *Cosmology and Newtonian limit in a model of gravity with nonlocally interacting metrics*, Phys. Dark Univ. **26** (2019), 100357 arXiv:2019.100357

45. L. Giani and O. F. Piattella, *Late-times asymptotic equation of state for a class of nonlocal theories of gravity*, Phys. Rev. D **100** (2019) no.12, 123508 arXiv:1906.10480

46. F. Sbis, P. O. Baqui, T. Miranda, S. E. Jors and O. F. Piattella, *Neutron star masses in R^2-gravity*, Phys. Dark Univ. C **27** (2020), 100411 arXiv:2019.100411

47. S. Profumo, L. Giani and O. F. Piattella, *An Introduction to Particle Dark Matter*, Universe **5** (2019) no.10, 213 arXiv:1910.05610

48. I. Torres, J. C. Fabris and O. F. Piattella, *Bouncing and Cyclic Quantum Primordial Universes and the Ordering Problem*, Class. Quant. Grav. **37** (2020) no.10, 105005 arXiv:1911.01487

49. I. Torres, J. C. Fabris, O. F. Piattella and A. B. Batista, *Quantum Cosmology of Fab Four John Theory with Conformable Fractional Derivative*, Universe **6** (2020) no.4, 50 arXiv:2001.07680

50. M. Wittner, G. Laverda, O. F. Piattella and L. Amendola, *Transient weak gravity in scalar-tensor theories*, arXiv:2003.08950, **Accepted for publication in JCAP**

Proceedings

1. A. A. Grib, Y. V. Pavlov, O. F. Piattella, *High energy processes in the vicinity of the Kerr's black hole horizon*, Int. J. Mod. Phys. Conf. Ser. 3, 342 (2011), arXiv:1105.1540

2. M. H. Daouda, J. C. Fabris and O. F. Piattella, *Scalar models for the unification of the dark sector,* AIP Conf. Proc. 1471 (2012) 57-60, arXiv:1204.2298

3. J. C. Fabris, O. F. Piattella, D. C. Rodrigues, C. E. M. Batista and M. H. Daouda, *Rastall cosmology,* Int. J. Mod. Phys. Conf. Ser. 18, 67 (2012), arXiv:1205.1198

4. D. C. Rodrigues, O. F. Piattella, J. C. Fabris and I. L. Shapiro, *Renormalization Group approach to Gravity: the running of G and L inside galaxies and additional details on the elliptical NGC 4494,* PoS DSU 2012 021, arXiv:1301.4148

5. J. C. Fabris, O. F. Piattella, D. C. Rodrigues, M. H. Daouda, *Rastall's Cosmology and its Observational Constraints* . Mar 22, 2014. 6 pp. Proceedings of the II CosmoSur conference, Valparaíso, Chile, 27 - 31 May 2013

6. D. C. Rodrigues, O. F. Piattella, J. C. Fabris and I. L. Shapiro, *Elliptical galaxies kinematics within general relativity with renormalization group effects*, Proceedings of VIII International Workshop on the Dark Side of the Universe (DSU 2012). June 10-15, 2012. Búzios, Rio de Janeiro, Brazil. Published online at `http://pos.sissa.it/cgi-bin/reader/conf.cgi?confid=161`

7. D. C. Rodrigues, B. Koch, O. F. Piattella and I. L. Shapiro, *The bending of light within gravity with large scale renormalization group effects*, AIP Conf. Proc. **1647** (2015) 57.

8. J. C. Fabris, O. F. Piattella, D. C. Rodrigues, B. Chauvineau and M. H. Daouda, *Introducing quantum effects in classical theories*, Int. J. Mod. Phys. A **31** (2016) no.02n03, 1641008, arXiv:1509.06806

9. J. C. Fabris, T. Miranda and O. F. Piattella, *An exponential correction to Starobinsky's inflationary model*, 2nd International Conference on Particle Physics and Astrophysics (ICPPA 2016), 10-14 Oct 2016. Moscow, Russia, arXiv:1611.05326

10. J. C. Fabris, T. Miranda and O. F. Piattella, *Variations on the Starobinsky Inflationary Model*, J. Phys. Conf. Ser. **798** (2017) no.1, 012092, doi:10.1088/1742-6596/798/1/012092

Books and chapters

1. Oliver F. Piattella, *Cosmology and Unified dark Matter: the Chaplygin gas and beyond*, ISBN 978-3-8443-8842-8, LAP Lambert Academic Publishing GmbH & Co, 2011.

2. Proceedings of the 1st Jose Plinio Baptista School of Cosmology: *Structure formation in an expanding Universe*, 2014, p. 277, J. C. Fabris, O. F. Piattella, D. C. Rodrigues, W. Zimdahl Editors, EDUFES

3. J. C. Fabris, O. F. Piattella, D. C. Rodrigues, H. E. S. Velten and W. Zimdahl, *The Cosmic Microwave Background*, Astrophys. Space Sci. Proc. **45** (2016)

4. D. Wands, O. F. Piattella and L. Casarini, *Physics of the Cosmic Microwave Background Radiation*, Astrophys. Space Sci. Proc. **45** (2016) 3, arXiv:1504.06335

5. O. F. Piattella, *Lecture Notes in Cosmology*, UNITEXT for Physics, Springer International Publishing (2018), ISBN 978-3-319-95569-8, arXiv:1803.00070. A constantly-updated pdf version can be found on my personal webpage: `http://ofp.cosmo-ufes.org/teaching.html`.