Curriculum Vitae

Leonardo G. Trombetta

Date of birth: March 26th, 1987 (age 36)
Nationality: Argentinian, Italian, Swiss

Mobile: +39-327-980-4299
Email: trombetta@fzu.cz
Skype: lgtrombetta
ORCID: 0000-0001-7345-5100
InspireHEP profile: L.G.Trombetta.1

(Updated on October 15, 2023)

Current position

- MSCA Postdoctoral Fellow at CEICO, Institute of Physics of the Czech Academy of Sciences, Prague, Czechia (since January 2023)

Previous positions

- Postdoc at CEICO, Institute of Physics of the Czech Academy of Sciences, Prague, Czechia (2020 - 2022)
- Postdoc at Scuola Normale Superiore, Pisa, Italy (2017 - 2020)
- Postdoc at Centro Atómico Bariloche and Instituto Balseiro, CONICET, Comisión Nacional de Energía Atómica, Argentina (2016 - 2017)

Academic background

Earned Degrees

- PhD in Physics - FCEyN - University of Buenos Aires, Argentina (March 2016)
  Supervisor: Prof. Francisco D. Mazzitelli (CAB)
- Licentiate in Physics (equivalent to M. Sc in Physics) - FCEyN - University of Buenos Aires, Argentina (March 2011)
- High school diploma with IT orientation - Arce School, Buenos Aires, Argentina (December 2004)

Fellowships

- Marie Skłodowska-Curie Actions (MSCA) - Postdoctoral Fellowship 2021 - Horizon Europe (2023 - 2024)
  Supervisor: Dr. Ignacy Sawicki (FZU)
- ICTP-IAEA Sandwich Training Educational Programme (2014 - 2016)
  Co-advisor: Dr. Paolo Creminelli (ICTP)
- PhD Fellow - CONICET (2011 - 2016)

Teaching background

- Teaching assistant - Physics department - FCEyN - University of Buenos Aires (2009 - 2016)
  Courses: Quantum Field Theory, Advanced electromganetism (4 times), General Relativity, Fluid Dynamics, Classical Mechanics, Newtonian Physics & Waves and electromagnetism (3 times).
- Teaching assistant - Common Basic Cycle - University of Buenos Aires (1st semester 2012)
  Course: Introductory Physics.

Scientific background

Publications

1. *"Symmetric Teleparallel Gauss-Bonnet Gravity and its Extensions"*, Juan Manuel Armaleo, Sebastian Bahamonde, Georg Trenkler & Leonardo G. Trombetta, arXiv: 2308.07299 [gr-qc].
2. *"Constraining a stochastic variation of the gravitational coupling with binary systems"*, Francisco D. Mazzitelli & Leonardo G. Trombetta, Phys. Rev. D. **107**, 124038 (2023), arXiv: 2304.01993 [gr-qc].
3. *"Stochastic particle creation: from the dynamical Casimir effect to cosmology"*, Matías Mantiñan, Francisco D. Mazzitelli & Leonardo G. Trombetta, Entropy **2023**, 25(1), 151, arXiv: 2212.13821 [quant-ph].
4. *"Symmetric Teleparallel Horndeski"*, Sebastian Bahamonde, Georg Trenkler, Leonardo G. Trombetta & Masahide Yamaguchi, Phys. Rev. D **107**, 104024 (2023), arXiv: 2212.08005 [gr-qc].
5. *"Causality Constraints on Black Holes beyond GR"*, Francesco Serra, Javi Serra, Enrico Trincherini & Leonardo G. Trombetta, JHEP **08** (2022) 157, arXiv:2205.08551 [hep-th].
6. *"Scalar-tensor cosmologies without screening"*, Johannes Noller, Luca Santoni, Enrico Trincherini & Leonardo G. Trombetta, JCAP **01** (2021) 045, arXiv:2008.08649 [astro-ph.CO].
7. *"Hairy Black-holes in Shift-symmetric Theories"*, Paolo Creminelli, Nicolás Loayza, Francesco Serra, Enrico Trincherini & Leonardo G. Trombetta, JHEP **08** (2020) 045, arXiv: 2004.02893 [hep-th].
8. *"Black Hole Ringdown as a Probe for Dark Energy"*, Johannes Noller, Luca Santoni, Enrico Trincherini & Leonardo G. Trombetta, Phys. Rev. D **101**, 084049 (2020), arXiv:1911.11671 [gr-qc].
9. *"To the sphere and back again: de Sitter infrared correlators at NTLO in 1/N"*, Diana L. López Nacir, Francisco D. Mazzitelli & Leonardo G. Trombetta, JHEP **08** (2019) 052, arXiv:1905.03665 [hep-th].
10. *"Long distance behavior of O(N)-model correlators in de Sitter space and the resummation of secular terms"*, Diana L. López Nacir, Francisco D. Mazzitelli & Leonardo G. Trombetta, JHEP **10** (2018) 016, arXiv:1807.05964 [hep-th].
11. *"Behind Horndeski: Structurally Robust Higher Derivative EFTs"*, Luca Santoni, Enrico Trincherini & Leonardo G. Trombetta, JHEP **08** (2018) 118, arXiv:1806.10073 [hep-th].
12. *Comment on "How the huge energy of quantum vacuum gravitates to drive the slow accelerating expansion of the Universe"*, Francisco D. Mazzitelli & Leonardo G. Trombetta, Phys. Rev. D **97**, 068301 (2018), arXiv:1801.00138 [gr-qc].
13. *"Nonlocal effective actions in semiclassical gravity: thermal effects in stationary geometries"*, Mauro Elías, Francisco D. Mazzitelli & Leonardo G. Trombetta, Phys. Rev. D **96**, 105007 (2017), arXiv:1709.10435 [hep-th].

14. *"O(N) model in Euclidean de Sitter space: beyond the leading infrared approximation"*, Diana L. López Nacir, Francisco D. Mazzitelli & Leonardo G. Trombetta, JHEP **09** (2016) 117, arXiv:1606.03481 [hep-th].

15. *"Hartree approximation in curved spacetimes revisited. II. The semiclassical Einstein equations and de Sitter self-consistent solutions"*, Diana L. López Nacir, Francisco D. Mazzitelli & Leonardo G. Trombetta, Phys. Rev. D **89**, 084013 (2014), arXiv:1401.6094 [hep-th].

16. *"Hartree approximation in curved spacetimes revisited: The effective potential in de Sitter spacetime"*, Diana L. López Nacir, Francisco D. Mazzitelli & Leonardo G. Trombetta, Phys. Rev. D **89**, 024006 (2014), arXiv:1309.0864 [hep-th].

17. *"Lifshitz scalar fields: one loop renormalization in curved backgrounds"*, Diana L. López Nacir, Francisco D. Mazzitelli & Leonardo G. Trombetta, Phys. Rev. D **85**, 024051 (2012), arXiv:1111.1662v2 [hep-th].

PhD thesis

On the application of non-perturbative methods in Quantum Field Theory in de Sitter spacetime to the study of infrared effects associated with massless fields or fields that are very light in units of the curvature (March 2016).
Advisor: Prof. Francisco D. Mazzitelli.

Master's thesis

On quantum self-interacting fields with violation of Lorentz invariance, in the context of the Hořava-Lifshitz modification of gravity (March 2011).
Advisor: Prof. Francisco D. Mazzitelli.

Conference proceedings

- *"Massless Interacting Scalar Fields in de Sitter space"*, Diana L. López Nacir, Francisco D. Mazzitelli & Leonardo G. Trombetta, EPJ Web of Conferences **125**, 05019 (2016), arXiv:1610.09943 [hep-th].

Works presented in meetings

- Talk - *Constructing Symmetric Teleparallel gravity theories with the Gauss-Bonnet invariant* - **CAS-JSPS-IBS CTPU-CGA 2023 Autumn Workshop on Cosmology, Gravity, Particle Physics** - Prague, Czechia (October 2023)
- Invited talk - *Symmetric Teleparallel gravity theories with the Gauss-Bonnet invariant* - **CAS-JSPS-IBS CTPU-CGA 2023 Summer Workshop on Cosmology, Gravity, Particle Physics** - Hokkaido, Japan (August 2023)
- Talk - *Causality constraints on hairy black-holes in shift-symmetric theories* - **GeomGrav2023** - Tartu, Estonia (June 2023)
- Poster - *Causality constraints on hairy black-holes* - **57th Rencontres de Moriond, Gravity** - La Thuile, Italy (Mar 2023)
- Talk - *Constraints on hairy black-holes in shift-symmetric scalar-tensor theories* - **2022 Winter CAS-JSPS Workshop in Cosmology, Gravitation and Particle Physics** - Prague and Třešt', Czechia (December 2022)
- Invited talk - *Causality constraints on black holes beyond GR* - **2022 Summer CAS-JSPS Workshop in Cosmology, Gravitation, and Particle Physics** - Oshima, Japan (August 2022)
- Talk - *Black Hole Ringdown as a Probe for Dark Energy* - **56th Rencontres de Moriond, Cosmology** - La Thuile, Italy (Jan 2022)

- Invited talk - *From dark energy to black holes in modified gravity* - **cosmo@ar** - Online (May 2021)
- Talk - *Consistent models of Dark Energy after GW170817 and GRB170817A* - **New Frontiers in Theoretical Physics XXXVI** - Cortona, Italy (May 2018).
- Talk - *Infrared effects in de Sitter spacetime: Non-perturbative treatments* - **Grav17** - La Falda, Argentina (April 2017).
- Talk - $O(N)$ *model in Euclidean de Sitter space: beyond the leading infrared approximation* - **Cosmology and the Quantum Vacuum** - CCBPP - Benasque, Spain (September 2016).
- Talk - *Infrared effects in de Sitter QFT: Non-perturbative treatments* - **First ICTP Advanced School on Cosmology** - ICTP - Trieste, Italy (May 2015).
- Talk - *Non perturbative quantum field theory in curved spaces: effective potential in de Sitter* (in Spanish) - **98$^{\mathbf{th}}$ National Meeting of the Argentine Physics Association** - Bariloche - Argentina (September 25, 2013).
- Talk - *Non perturbative quantum field theory in curved spaces: effective potential in de Sitter* - **COSMO 2013** - University of Cambridge, UK (September 5, 2013).
- Poster - *Interacting fields in DeSitter spacetime: non-perturbative approaches* - Authors: López Nacir Diana, Mazzitelli Francisco D. & Trombetta Leonardo G. - **Summer School on Cosmology** - ICTP - Trieste, Italy (July 2012).
- Talk - *Lifshitz scalar fields: one loop renormalization in curved backgrounds* - **PASI2012 - Exploring the Terascale and Beyond** - University of Buenos Aires, Argentina (March 5, 2012).
- Poster - *Lifshitz self-interacting quantum field in flat and (weakly-)curved backgrounds* (in Spanish) - Authors: López Nacir Diana, Mazzitelli Francisco D. & Trombetta Leonardo G. - **II Joint Meeting of the Uruguayan Physics Society and the Argentine Physics Association** - Montevideo, Uruguay (September 2011) and **First Argentine-Brazilian Meeting on Gravitation, Astrophysics and Cosmology** - Foz do Iguaçu, Brazil (October 2011).
- Talk - *Lifshitz self-interacting quantum field in flat and (weakly-)curved backgrounds* - **Workshop on String Theory, Gravity and Fields** - IAFE - University of Buenos Aires, Argentina (2011).
- Poster - *Meassurement of the angular distribution of the elastic dispersion of the system* $^{9}Be + {}^{120}Sn$ (in Spanish) - Authors: Andrés Nahuel & Trombetta Leonardo G. - **95$^{\mathbf{th}}$ National Meeting of the Argentine Physics Association** - Malargüe, Mendoza, Argentina (2010).

Attendance to meetings, simposiums, conferences and schools

- Gravitational waves meet effective field theories - CCBPP - Benasque, Spain (August 2023)
- Multimessengers and the large-scale structure - CEICO - Prague, Czech Republic (December 2021)
- The Unbearable Lightness of the Universe - CEICO - Prague, Czech Republic (September 2021)
- Quarks 2020: Modification of Gravity: Theories and Observations - INR RAS, Moscow - Online (June 2021)
- Positivity and the Bootstrap - Online (June 2021)
- The Quantum & The Gravity 2021 - Charles University in Prague, University of Salerno - Online (April 2021)
- Cosmology 2021: the Rise of Field Theory - Cambridge - LMU Joint Workshop - Online (Jan 2021)
- Gravitational Waves, Black Holes and Fundamental Physics - IFPU - Trieste, Italy (January 2020)
- Precision Gravity: From the LHC to LISA - MIAPP - Munich, Germany (September 2019)

- ICTP School on Geometry and Gravity - ICTP - Trieste, Italy (July 2019)
- 11th TRR33 Winter School on Cosmology - Passo del Tonale, Italy (December 2017)
- 8th International Conference on the Exact renormalization Group (ERG2016) - ICTP - Trieste, Italy (September 2016)
- Summer School on Cosmology - ICTP - Trieste, Italy (August 2014)
- Pre SUSY School and SUSY conference - ICTP - Trieste, Italy (August 2013)
- School and Workshop on New Light in Cosmology from the CMB - ICTP - Trieste, Italy (July 2013)
- Workshop on String Theory, Gravity and Fields 2nd ed. - Buenos Aires, Argentina (October 2012)
- Summer School on Cosmology - ICTP - Trieste, Italy (July 2012)
- Cape Town International Cosmology School - Stellenbosch, South Africa (January 2012)
- Quantum Gravity in the Southern Cone V - Buenos Aires, Argentina (2010)

Seminars

- *Adding a scalar field to theories of gravity based on nonmetricity* - SNS - Pisa, Italy (May 2023)
- *Constraints on hairy black-holes in shift-symmetric theories* - YITP - Kyoto, Japan (September 2022)
- *Constraining Modified Gravity EFTs with Black Holes* - DF UBA - Buenos Aires, Argentina (November 2021)
- *From dark energy to black holes in modified gravity* - CAB - Bariloche, Argentina (June 2020)
- *Consistent models of dark energy after GW170817 and GRB170817A* - CAB - Bariloche, Argentina (December 2018)
- *Infrared effects in de Sitter spacetime: nonperturbative treatments* - Scuola Normale Superiore, Pisa (March 2018).
- *Infrared effects in de Sitter spacetime: nonperturbative treatment of secular terms.*
  University of Barcelona, University of Bologna, ICTP Trieste and APC, University of Paris 7 Diderot (October-November 2016).
- *Infrared effects in de Sitter QFT: Non-perturbative treatments* - CAB - Bariloche, Argentina (August 2015).
- *Quantum Fields in DeSitter: non-perturbative effects with the 2PI formalism* - CAB - Bariloche, Argentina (February 2013).

Visits to institutes

- Two weeks at Munich Institute for Astro- and Particle Physics in the context of the workshop "Precision Gravity: From the LHC to LISA" (Sept 2019)
- Three semesters at ICTP, Trieste, Italy - Scientific collaboration with members of the High Energy Group within the framework of the Sandwich Training Educational Programme (STEP) (Jul - Dec 2014, Apr - Aug 2015, Aug - Nov 2016)
- Short stay (45 days) at ICTP, Trieste, Italy - Scientific collaboration with members of the High Energy Group (July - August 2013)

Organizational activities

- CEICO Seminar organizer - FZU - Prague, Czechia (2022-2023)

Science outreach activities

- European Researcher's Night - FZU - Czech Academy of Sciences - Prague, Czechia
  Role: Stand organizer and presenter (October 2023)
- Science Fair - Czech Academy of Sciences - Prague, Czechia
  Role: Stand organizer and presenter (June 2023)
- Participation in the webinar "How to see 'ghosts' and communicate science" by Russ Hodge - FZU - Czech Academy of Sciences (2021).
- Talk - *Quantum Effects in the Early Universe: Inflation* (for undergraduate students) - IAFE/DF - University of Buenos Aires, Argentina (September 2012)
- Workshop - *How does a physicist work?* (for high school students) - University of Buenos Aires, Argentina
  Role: Tutor in electromagnetism experiments (2012 & 2013)
- Physics week - FCEyN - University of Buenos Aires, Argentina
  Role: Stand coordinator (2012 & 2013), presenter (2010 & 2011)
- Talks cycle for students: "Fridays with dessert" - DF - University of Buenos Aires, Argentina
  Role: Co-organizer under the guidance of Dr. Daniel De Florian (2009 - 2011)

Other background

Languages

- Spanish (Native speaker)
- English (C1)
  Certificate in Advanced English (CAE) - Cambridge University (2003)
- German (B1)
  Language Courses - Languages Universitary Centre, Buenos Aires, Argentina (2008 - 2014)
- Italian (B2)
  Language Courses - Languages Universitary Centre, Buenos Aires, Argentina (2010 - 2014)

Internships

- Firm: HITEC Engineering LLC, Buenos Aires, Argentina (2004 - 2006)
  Activities: C, PHP & Delphi programming of automatization systems for industrial processes.

Other interests

- Outdoor activities (biking, hiking, climbing, skiing) and other sports.