

# Guillermo Gambini

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### About me

Ph.D. in Physics, problem solver, and highly motivated to uncover the mysteries of the universe.

### Personal

Nationality: Peruvian

### Areas of interest

Dark Matter • Neutrinos  
• Phenomenology

@GGRG3107

### REFERENCES

- James M. Cline**  
McGill University  
jcline@physics.mcgill.ca
- Farinaldo S. Queiroz**  
International Institute of Physics  
farinaldo.queiroz@ufrn.br
- Giorgio Torrieri**  
State University of Campinas  
torrieri@unicamp.br


## SHORT RESUMÉ

I graduated in Physics from the National University of Engineering in Peru. Then, I moved to Brazil and got a Master's degree in Physics from the State University of Campinas (Unicamp) working on relativistic heavy-ion collisions. For the Ph.D., also in Physics, I got enrolled in the first joint Ph.D./cotutelle program between Unicamp and McGill University in Canada. I worked on new models of dark matter: asymmetric dark matter, heavy neutral leptons, and decaying dark matter. I also have experience in vacuum stability, 3-3-1 and B-L models, dark photons and indirect detection of dark matter.


## EDUCATION

- 2022


**Ph.D. in Physics**  
MCGILL UNIVERSITY & STATE UNIVERSITY OF CAMPINAS  
Supervisors: James M. Cline & Pedro C. de Holanda


- 2016

**Master of Science**  
STATE UNIVERSITY OF CAMPINAS (UNICAMP)  
Supervisor: Giorgio Torrieri


- 2013

**Bachelor of Science**  
NATIONAL UNIVERSITY OF ENGINEERING  
Supervisor: Orlando Luis Pereyra Ravinez



## LANGUAGE PROFICIENCY

- Spanish

Portuguese

English
- Mother tongue

## TECHNICAL STRENGTHS

- C++

Fortran

LaTeX

Linux

Mathematica

Python

micrOMEGAS

FeynRules

CalcHEP


SARAH

FeynCalc
- 


## WORK EXPERIENCE

- 2025-I


**Lecturer**  
ELECTROMAGNETISM, PHYSICS I ·  
National University of Engineering


- 2024-III


**Lecturer**  
ELECTROMAGNETISM ·  
National University of Engineering


- 2024-II


**Lecturer**  
QUANTUM MECHANICS ·  
National University of Engineering


- 2023

**Postdoctoral Researcher**  
ASTROPARTICLE PHYSICS ·  
University of São Paulo - São Carlos Institute of Physics


- 2020-I

**Research trainee**  
ASTROPARTICLE PHYSICS ·  
McGill University



## PUBLICATION LIST

- 2025** *Probing late-time annihilations of oscillating asymmetric dark matter via rotation curves of galaxies*, Júlia G. Mamprim, Guillermo Gambini, Luan B. Arbeletche, Marcos Olegario, Vitor de Souza EPJC
- 2024** *Constraining Gamma-ray Lines from Dark Matter Annihilation using Fermi-LAT and H.E.S.S. data*, Lucia Angel, Guillermo Gambini, Leticia Guedes, Farinaldo S. Queiroz, Vitor de Souza JCAP - arXiv:2311.17827
- 2022** *Constraints on energy scales from dark matter decay in a gauged  $B - L$  model*, Guillermo Gambini, Pedro C. de Holanda, Saulo Carneiro - arXiv:2205.12353
- 2022** *Constraints on Heavy Neutral Leptons interacting with a singlet scalar*, James M. Cline, Guillermo Gambini - PRD - arXiv:2203.08166
- 2021** *Late-Time Dark Matter Oscillations and the Core-Cusp Problem*, James M. Cline, Guillermo Gambini, Samuel D. McDermott, Matteo Puel - JHEP - arXiv:2010.12583
- 2019** *Vacuum Stability of the Economical 3-3-1 model from Copositivity*, Bruce Sánchez-Vega, Guillermo Gambini, Carlos Álvarez-Salazar - EPJC - arXiv:1811.00585
- 2017** *Azimuthal instabilities of the Gribov-Levin-Ryskin equation*, Guillermo Gambini, Giorgio Torrieri - EPJA - arXiv:1606.07865
- 2016** *Stability of the GLR equation*, Guillermo Gambini, Giorgio Torrieri - PoS (DIS2016) 045

## TALKS

- 2025** 'Materia oscura, ¿Estás realmente ahí afuera?', in *Jueves Científicos* at National University of Engineering in Lima, Peru,
- 2024** 'Sondando a natureza da matéria escura em experimentos com neutrinos relíquias', in *SU(N) special club* at Unicamp in Campinas, Brazil,
- 2023** 'Neutrinos e suas massas', in *Pecha Kucha Seminars, IFSC - USP* in São Carlos, Brazil,
- 2023** 'Constraints on dark matter lines coming from the Galactic Center using Fermi-LAT data', in *Spring Meeting of the Brazilian Physical Society* in Niterói, Brazil,
- 2023** **(by invitation)** 'Probing the nature of dark matter in relic neutrino experiments', in *International Institute of Physics (IIP) - Seminars* in Natal, Brazil,
- 2023** 'Matéria escura assimétrica e os perfis de densidade das galáxias anãs do SPARC', in *Phe-noBR* in Natal, Brazil,
- 2023** 'A dark matter signature in relic neutrino searches', in *São Paulo Advanced School on Multimessenger Astrophysics* in São Paulo, Brazil,
- 2023** 'Cusp-to-core conversion from late-time dark matter oscillations', in *Brazilian CTA Meeting*, São Carlos, Brazil,
- 2022** 'Constraining Heavy Neutral Leptons in the MeV-GeV mass range interacting with a singlet scalar', en *XLII National Meeting on Particle Physics and Fields* in Natal, Brazil,
- 2022** 'Recasting constraints on heavy neutral leptons interacting with a singlet scalar', in *Canadian-Cuban-American-Mexican Graduate-Student Physics Conference (C<sup>2</sup>AM)* en Ontario, Canada,
- 2022** **(by invitation)** 'Constraints on Heavy Neutral Leptons interacting with a singlet scalar', in *Searching for long-lived particles at the LHC and beyond: Eleventh workshop of the LLP Community* in Geneva, Switzerland [virtual],
- 2016** 'A non-hydrodynamic explanation of  $v_2$ ', in *XXVII Workshop on Hadronic Interactions* in São Paulo, Brazil,
- 2016** 'Azimuthal correlations in hadronic collisions from instabilities of the initial state', in *Goethe University Frankfurt ITP Transport Meeting* in Frankfurt, Germany,
- 2016** 'Stability structure of the GLR equation', en *XXIV International Workshop on Deep Inelastic Scattering and Related Subjects* in Hamburg, Germany,
- 2015** 'Azimuthal correlations in hadronic collisions from instabilities of the initial state', in *XXXVIII Brazilian Meeting on Nuclear Physics* in Rio de Janeiro, Brazil.

## GRANTS AND TRAVEL AWARDS

- 2023** Postdoctoral Scholarship - São Paulo Research Foundation (FAPESP) - Brazil
- 2022** Travel award - McGill Graduate & Postdoctoral Studies - Canada
- 2021** Travel award - McGill Graduate & Postdoctoral Studies - Canada
- 2021** Trottier award - McGill Space Institute - Canada
- 2020** Trottier award - McGill Space Institute - Canada
- 2020** Ph.D. - Natural Sciences and Engineering Research Council (NSERC) - Canada
- 2020** Research Trainee - Emerging Leaders of the Americas Program (ELAP) - Canada
- 2016** Ph.D - National Council for Scientific and Technological Development (CNPq) - Brazil
- 2014** Master - National Council for Scientific and Technological Development (CNPq) - Brazil