

Gustavo Marques-Tavares

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Citizenship: Brazil

Education

- **Boston University** Boston, MA
Ph.D. Physics 2015
– Advisor: Prof. Martin Schmaltz
- **Universidade Estadual de Campinas** Campinas, Brazil
M.Sc. in Physics 2010
- **Universidade Estadual de Campinas** Campinas, Brazil
B.Sc. in Physics 2008

Academic Positions

- **University of Utah** Salt Lake City, UT
Assistant Professor 2023-
- **University of Maryland** College Park, MD
Research Associate 2018-2023
- **Johns Hopkins University** Baltimore, MD
Joint Postdoc Affiliation 2019-2020
- **Stanford University** Stanford, CA
Research Associate 2015-2018

Fellowships and Awards

- **DOE High Energy Physics Graduate Fellowship in Theory** Boston University
US\$108k over 2 years 2012
- **LHC Theory Initiative Graduate Fellowship** Boston University
US\$40k over 1 year 2012
- **The Gertrude and Maurice Goldhaber Award in Physics** Boston University
For outstanding achievement by a first-year graduate student 2011

Mentoring

- Postdoc Mentoring
– Melissa Joseph, University of Utah

- PhD students I co-advised
 - Dawid Brzeminski, University of Maryland
 - Clayton Ristow, University of Maryland
 - Melissa Diamond, Johns Hopkins University
 - William DeRocco, Stanford University
 - Mae Teo, Stanford University

Publications

- A. Hook, G. Marques-Tavares, and C. Ristow, “CMB Spectral Distortions from an Axion-Dark Photon-Photon Interaction,” [arXiv:2306.13135](#) [[hep-ph](#)]
- M. A. Buen-Abad, Z. Chacko, C. Kilic, G. Marques-Tavares, and T. Youn, “Stepped partially acoustic dark matter: likelihood analysis and cosmological tensions,” *JCAP* **11** (2023) 005, [arXiv:2306.01844](#) [[astro-ph.CO](#)]
- M. Diamond, D. F. G. Fiorillo, G. Marques-Tavares, I. Tamborra, and E. Vitagliano, “Multimessenger Constraints on Radiatively Decaying Axions from GW170817,” [arXiv:2305.10327](#) [[hep-ph](#)]
- M. Diamond, D. F. G. Fiorillo, G. Marques-Tavares, and E. Vitagliano, “Axion-sourced fireballs from supernovae,” *Phys. Rev. D* **107** no. 10, (2023) 103029, [arXiv:2303.11395](#) [[hep-ph](#)]
- M. A. Buen-Abad, Z. Chacko, C. Kilic, G. Marques-Tavares, and T. Youn, “Stepped partially acoustic dark matter, large scale structure, and the Hubble tension,” *JHEP* **06** (2023) 012, [arXiv:2208.05984](#) [[hep-ph](#)]
- D. Brzeminski, A. Hook, and G. Marques-Tavares, “Precision early universe cosmology from stochastic gravitational waves,” *JHEP* **11** (2022) 061, [arXiv:2203.13842](#) [[hep-ph](#)]
- M. D. Diamond and G. Marques-Tavares, “ γ -Ray Flashes from Dark Photons in Neutron Star Mergers,” *Phys. Rev. Lett.* **128** no. 21, (2022) 211101, [arXiv:2106.03879](#) [[hep-ph](#)]
- A. Hook, G. Marques-Tavares, and C. Ristow, “Supernova constraints on an axion-photon-dark photon interaction,” *JHEP* **06** (2021) 167, [arXiv:2105.06476](#) [[hep-ph](#)]
- P. Agrawal, A. Hook, J. Huang, and G. Marques-Tavares, “Axion string signatures: a cosmological plasma collider,” *JHEP* **01** (2022) 103, [arXiv:2010.15848](#) [[hep-ph](#)]
- A. Hook, G. Marques-Tavares, and D. Racco, “Causal gravitational waves as a probe of free streaming particles and the expansion of the Universe,” *JHEP* **02** (2021) 117, [arXiv:2010.03568](#) [[hep-ph](#)]
- N. Blinov and G. Marques-Tavares, “Interacting radiation after Planck and its implications for the Hubble Tension,” *JCAP* **09** (2020) 029, [arXiv:2003.08387](#) [[astro-ph.CO](#)]
- A. Hook, G. Marques-Tavares, and Y. Tsai, “Scalars Gliding Through an Expanding Universe,” *Phys. Rev. Lett.* **124** no. 21, (2020) 211801, [arXiv:1912.08817](#) [[hep-ph](#)]

- W. DeRocco, P. W. Graham, D. Kasen, G. Marques-Tavares, and S. Rajendran, “Supernova signals of light dark matter,” *Phys. Rev.* **D100** (2019) 075018, [arXiv:1905.09284 \[hep-ph\]](#)
- G. Krnjaic, G. Marques-Tavares, D. Redigolo, and K. Tobioka, “Probing Muonic Forces and Dark Matter at Kaon Factories,” *Phys. Rev. Lett.* **124** (2020) 041802, [arXiv:1902.07715 \[hep-ph\]](#)
- W. DeRocco, P. W. Graham, D. Kasen, G. Marques-Tavares, and S. Rajendran, “Observable signatures of dark photons from supernovae,” *JHEP* **02** (2019) 171, [arXiv:1901.08596 \[hep-ph\]](#)
- G. Marques-Tavares and M. Teo, “Light axions with large hadronic couplings,” *JHEP* **05** (2018) 180, [arXiv:1803.07575 \[hep-ph\]](#)
- P. Agrawal, G. Marques-Tavares, and W. Xue, “Opening up the QCD axion window,” *JHEP* **03** (2018) 049, [arXiv:1708.05008 \[hep-ph\]](#)
- A. Hook and G. Marques-Tavares, “Relaxation from particle production,” *JHEP* **12** (2016) 101, [arXiv:1607.01786 \[hep-ph\]](#)
- S. Dimopoulos, A. Hook, J. Huang, and G. Marques-Tavares, “A collider observable QCD axion,” *JHEP* **11** (2016) 052, [arXiv:1606.03097 \[hep-ph\]](#)
- J. Lesgourgues, G. Marques-Tavares, and M. Schmaltz, “Evidence for dark matter interactions in cosmological precision data?,” *JCAP* **1602** no. 02, (2016) 037, [arXiv:1507.04351 \[astro-ph.CO\]](#)
- M. A. Buen-Abad, G. Marques-Tavares, and M. Schmaltz, “Non-Abelian dark matter and dark radiation,” *Phys. Rev.* **D92** no. 2, (2015) 023531, [arXiv:1505.03542 \[hep-ph\]](#)
- E. Katz, G. Marques Tavares, and Y. Xu, “A solution of 2D QCD at Finite N using a conformal basis,” [arXiv:1405.6727 \[hep-th\]](#)
- A. Cohen, G. Marques Tavares, and Y. Xu, “Seeking Lorentz Violation from the Higgs,” [arXiv:1404.3185 \[hep-ph\]](#)
- E. Katz, G. Marques Tavares, and Y. Xu, “Solving 2D QCD with an adjoint fermion analytically,” *JHEP* **1405** (2014) 143, [arXiv:1308.4980 \[hep-th\]](#)
- G. Marques Tavares, M. Schmaltz, and W. Skiba, “Higgs mass naturalness and scale invariance in the UV,” *Phys.Rev.* **D89** (2014) 015009, [arXiv:1308.0025 \[hep-ph\]](#)
- C. Gross, G. Marques Tavares, M. Schmaltz, and C. Spethmann, “Light axigluon explanation of the Tevatron $t\bar{t}$ asymmetry and multijet signals at the LHC,” *Phys.Rev.* **D87** (2013) 014004, [arXiv:1209.6375 \[hep-ph\]](#)
- G. Marques Tavares and M. Schmaltz, “Explaining the t - $t\bar{t}$ asymmetry with a light axigluon,” *Phys.Rev.* **D84** (2011) 054008, [arXiv:1107.0978 \[hep-ph\]](#)
- Z. Ligeti, G. Marques Tavares, and M. Schmaltz, “Explaining the t $t\bar{t}$ forward-backward asymmetry without dijet or flavor anomalies,” *JHEP* **1106** (2011) 109, [arXiv:1103.2757 \[hep-ph\]](#)
- R. A. Mosna and G. Marques Tavares, “New self-dual solutions of $SU(2)$ Yang-Mills theory in Euclidean Schwarzschild space,” *Phys.Rev.* **D80** (2009) 105006, [arXiv:0909.5145 \[math-ph\]](#)

Service

- **Department of Physics, University of Utah**
 - 2023-2024 Committee: Graduate Admissions Coordination
 - 2023-2024 Committee: Public Presentation/Colloquium

Seminars and Talks

- **SPartAcous: a new interacting dark sector model faces cosmological tensions**
 - Arizona State University, Tempe, Cosmology Seminars, October 2023
- **Precision early universe cosmology from gravitational waves**
 - New York University, New York, HEP Seminar, September 2022
 - University of California, Davis, High Energy Seminars (virtual), May 2022
- **Dark sector signals from supernovae and neutron star mergers**
 - Dark Matter in Compact Objects, Stars, and in Low Energy Experiments Workshop, Seattle, August 2022
- **Dark photon visible flashes in neutron star mergers**
 - Caltech, Pasadena, HEP Seminar, October 2022
 - Pennsylvania State University, State College, HEPAP/CMA Seminar, November 2021
 - University of Utah, Salt Lake City, HEAP Seminar, November 2021
 - University of Oklahoma, Virtual, HEP Seminar, November 2021
 - Boston University, Boston, High Energy Theory Seminar, October 2021
 - PASCOS Plenary, (virtual), June 2021
 - Aspen Winter Conference, (virtual), March 2021
 - University of Wisconsin, Madison (virtual), theory seminar, March 2021
 - TRIUMF, Vancouver Canada (virtual), theory seminar, February 2021
- **Scalars gliding in an expanding universe**
 - BSM Pandemic series, virtual, July 2020
 - JGU Mainz, theory palaver (virtual), June 2020
 - LBNL, particle seminar (virtual), May 2020
 - KITP, From Inflation to the Hot Big Bang, Feb 2020
 - GGI Conference, Florence, Italy, September 2019
- **Observable signatures of dark photons from supernovae**
 - Joint Israel Seminar, Tel Aviv, Israel, June 2019

- Fermilab, Batavia, Theoretical Physics Seminars, March 2019
- Cornell University, Ithaca, LEPP Joint Seminar, March 2019
- Johns Hopkins University, Baltimore, High Energy Physics and Cosmology Seminars, March 2019
- SUNY Stony Brook, Stony Brook, Pheno Seminar, February 2019

- **Detecting dark particles from Supernovae**

- Searching for new physics - Leaving no stone unturned, Salt Lake City, UT, August 2019
- Searching for New Physics on the Horizon, Seoul, South Korea, May 2019
- Princeton University, Princeton, pheno and vino seminar, October 2018
- University of Michigan, Ann Arbor, LCTP brown bag seminar, October 2018
- The Future of BSM Physics, Anacapri, June 2018
- University of Oregon, CHEP/ITS joint seminar, May 2018
- KITP, High Energy Physics at the Sensitivity Frontier, May 2018
- University of California, Irvine, Joint Particle Seminar, April 2018
- APS April Meeting, Columbus, OH, April 2018
- University of California, Berkeley, 4D seminar, April 2018
- University of California, San Diego, HET seminar, March 2018
- University of California, Davis, joint theory seminar, December 2017
- University of Minnesota, Twin Cities, High energy theory lunchtime seminar, October 2017
- Harvard University, Particle seminar, October 2017
- University of Maryland, College Park, EPT seminar, October 2017
- SLAC, EPP theory seminar, October 2017

- **Low mass axion dark matter abundance through new early universe dynamics**

- Weizmann Institute of Science, Naturalness at the low and high energy fronts, November 2017
- University of California, Berkeley, 4D seminar, April 2017

- **Relaxion from particle production**

- Origin of the Vacuum Energy and Electroweak Scales workshop, KITP, Santa Barbara, CA, June 2019
- Mainz Institute for Theoretical Physics, workshop talk, June 2017
- Boston University, HET seminar, March 2017
- University of Wisconsin, Madison, theory seminar, March 2017
- Perimeter Institute, particle physics seminar, March 2017
- SLAC, LHC-TI meeting seminar, February 2017
- Fermilab, theoretical physics seminar, September 2016
- University of Illinois, Chicago, high energy physics seminar, September 2016
- DESY, workshop talk, September 2016
- University of California, Davis, joint theory seminar, May 2016

- **Non-abelian dark matter and dark radiation**

- University of Geneva, seminar, September 2015
- Phenomenology Symposium, parallel talk, May 2015
- MIT, nuclear and particle theory seminar, February 2015
- University of California, Davis, joint theory seminar, November 2014
- LBNL, particle seminar, November 2014

Conferences & Workshops

- **Dark Matter in Compact Objects, Stars, and in Low Energy Experiments** Seattle, WA
Institute for Nuclear Theory 2022
- **Phase Transitions and Topological Defects in the Early Universe** Cambridge, MA
Harvard University 2022
- **Physics and Astrophysics at the Extreme** Cambridge, MA
MIT 2022
- **Phenomenology Symposium** Pittsburgh, PA
University of Pittsburgh 2022
- **Dark Matter from the Laboratory to the Cosmos** Aspen, CO
Aspen Center for Theoretical Physics 2021
- **Cambridge High Energy Workshop** Cambridge, MA
Harvard University (Virtual) 2021
- **PASCOS** Daejeon, South Korea
IBS, Center for Theoretical Physics of the Universe (Virtual) 2021
- **A Rainbow of Dark Sectors** Aspen, CO
Aspen Center for Theoretical Physics (Virtual) 2021
- **From Inflation to the Hot Big Bang** Santa Barbara, CA
Kavli Institute for Theoretical Physics 2020
- **Next Frontiers in the Search for Dark Matter** Florence, Italy
The Galileo Galilei Institute for Theoretical Physics 2019
- **Searching for new physics - Leaving no stone unturned** Salt Lake City, UT
University of Utah 2019
- **Origin of the Vacuum Energy and Electroweak Scales** Santa Barbara, CA
Kavli Institute for Theoretical Physics 2019
- **The Weak Scale at a Crossroads** Munich, Germany
Munich Institute for Astro- and Particle Physics 2019
- **Searching for New Physics on the Horizon** Seoul, South Korea
Korea University 2019
- **The Future of BSM Physics** Anacapri, Italy
Villa Orlandi 2018
- **High Energy Physics at the Sensitivity Frontier** Santa Barbara, CA
Kavli Institute for Theoretical Physics 2018

- **APS April Meeting** Columbus, OH
2018
- **BSM in direct, indirect and tabletop experiments** Rehovot, Israel
Weizmann Institute of Science 2017
- **Developing New Tools for Dark Matter Searches** Aspen, CO
Aspen Center for Theoretical Physics 2017
- **The TeV Scale: A Threshold to New Physics?** Mainz, Germany
Mainz Institute for Theoretical Physics 2017
- **LHC-TI Fellows Meeting** Menlo Park, CA
SLAC National Accelerator Laboratory 2017
- **BSM faces LHC run-2 realities** Hamburg, Germany
DESY 2016
- **The Many Faces of Naturalness** Aspen, CO
Aspen Center for Theoretical Physics 2016
- **Gearing up for LHC13** Florence, Italy
The Galileo Galilei Institute for Theoretical Physics 2015
- **Phenomenology Symposium** Pittsburgh, PA
University of Pittsburgh 2015
- **Phenomenology Symposium** Pittsburgh, PA
University of Pittsburgh 2014
- **Beyond the Standard Model after the first run of the LHC** Florence, Italy
The Galileo Galilei Institute for Theoretical Physics 2013
- **LHC Theory Initiative Meeting** Stony Brook, NY
Stony Brook University 2013
- **The first year of the LHC** Santa Barbara, CA
Kavli Institute for Theoretical Physics 2013