

# GABRIELE MONTEFALCONE

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## INSTITUTIONAL HISTORY

### Doctor of Philosophy in Physics

📅 Sep 2021 ▶ Now

University of Texas at Austin, Weinberg Institute for Theoretical Physics

Austin, TX

Advised by Katherine Freese

### Bachelor of Arts in Physics

📅 Sep 2016 ▶ Jun 2020

Princeton University, Department of Physics

Princeton, NJ

Senior Thesis (advised by Lyman Page):  [Exploring properties of galaxy clusters with the Atacama Cosmology Telescope](#)

Junior Paper II (advised by Paul J. Steinhardt):  [Exploring extra dimensions with constraints on the variation of Newton's Constant](#)

Junior Paper I (advised by Cristiano Galbiati):  [The DarkSide-LowMass Experiment and its Physics Potential](#)

## PAPERS

### Journal Publications

5. **GM**, V. Aragam, L. Visinelli, K. Freese, *WarmSPy: a numerical study of cosmological perturbations in warm inflation*, [JCAP01\(2024\)032](#)
4. **GM**, V. Aragam, L. Visinelli, K. Freese, *Observational constraints on warm natural inflation*, [JCAP 03 \(2023\) 002](#)
3. **GM**, V. Aragam, L. Visinelli, K. Freese, *Constraints on the scalar-field potential in warm inflation*, [Phys.Rev.D 107 \(2023\) 6, 063543](#)
2. **GM**, M. H. Abitbol, D. Kodwani, R.D.P. Grumitt, *Inpainting CMB maps using partial convolutional neural networks*, [JCAP 03 \(2021\) 055](#)
1. **GM**, P.J. Steinhardt, D.H. Wesley, *Dark energy, extra dimensions, and the Swampland*, [JHEP 06 \(2020\) 091](#)

### Preprints

6. N. Bellomo, K. Boddy, S. Moltner, **GM**, *Investigation of CMB constraints for dark matter-electron absorption*, [arXiv:240X.XXXXX](#)
5. **GM**, B. Wallisch, K. Freese, *Probing free-streaming radiation with the Cosmic Microwave Background*, [arXiv:240X.XXXXX](#)
4. **GM**, B. Shams Es Haghi, K. Freese, *Freeze-in from Warm Inflation*, [arXiv:2401.XXXXX](#)
3. **GM**, Rudnei O. Ramos, Gustavo S. Vicente, K. Freese, *The efficient suppression of eternal inflation in a strongly dissipative warm inflation regime*, [arXiv:2401.XXXXX](#)
1. **GM**, Rudnei O. Ramos, Gustavo S. Vicente, K. Freese, *Defying eternal inflation in warm inflation with a negative running*, [arXiv:2311.03487 \[astro-ph.CO\]](#) (accepted for publication by JCAP)

## 🌟 AWARDS & FELLOWSHIPS

### Steven Weinberg Summer Fellowship

📅 May 2023 ▶ Aug 2023

Texas Center for Cosmology and Astroparticle Physics (TCCAP), University of Texas at Austin

Awarded annually to one member of the TCCAP. Stipend of \$7,500 and tuition for summer term included.

### A. G. Shenstone Prize Winner in Physics

📅 Jun 2018 - Jun 2019

Department of Physics, Princeton University

Recognizes annually outstanding Physics undergraduates who have shown excellence in course work and promise in independent research. Awarded prize of \$750.

### Invited Talks

Particle Production and Thermal Effects in Inflation 📅 Feb 2024  
*Physics Department, King's College London* *Virtual on Zoom*

🔗 Freeze-in in Warm Inflation

Cosmology-Astro Seminar 📅 Oct 2023  
*Leinweber Center for Theoretical Physics, University of Michigan* *Ann Arbor, MI*

🔗 [The Imprint of cosmic neutrinos & other light-relics in the CMB](#)

Theoretical Cosmology Seminar 📅 Jun 2023  
*CoPS division, the Oskar Klein Center, Department of Physics, Stockholm University* *Stockholm, Sweden*

🔗 [Warm Inflation: Warm Natural inflation and other recent developments](#)

### At the University of Texas at Austin

Weinberg Institute, Brown Bag Seminar 📅 November 2023

🔗 [The Imprint of cosmic neutrinos & other light-relics in the CMB](#)

Physics Concerto Seminar Series 📅 Oct 2023

🔗 [Beyond the Big Bang: Delving into Inflationary Cosmology](#)

Weinberg Institute, Brown Bag Seminar 📅 January 2023

🔗 [Warm Natural Inflation](#)

### ✈ VISITS

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**MIAPbP** 📅 July 1 ▶ 19 2024  
*Munich Institute of Astro-,Particle & BioPhysics* *Munich, Germany*

Summer School on Quantum Aspects of Inflationary Cosmology

**University of Michigan** 📅 Oct 15 ▶ 20 2023  
*Leinweber Center for Theoretical Physics, University of Michigan* *Ann Arbor, MI*

Visiting Researcher

**Stockholm University** 📅 Jun 1 ▶ 30 2023  
*Oskar Klein Center, Department of Physics, Stockholm University* *Stockholm, Sweden*

Visiting Researcher

**Oxford University** 📅 Jun 1 ▶ August 10 2019  
*Department of Astrophysics, Oxford University* *Oxford, United Kingdom*

Research Intern

### 📣 OUTREACH

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**Physics Concerto Seminar Series** 📅 Sep 2023 ▶ Now  
*Department of Physics, University of Texas at Austin* *Austin, Tx*

🔗 [physicsconcerto.com](https://physicsconcerto.com)

Founder and organizer of the Physics Concerto, a peer-to-peer seminar series with the aim of enabling graduate students to delve into fields and roles beyond their own concentration at an advanced, yet comprehensible, level.

**Physics Competition by Physics Unlimited** 📅 Nov 2019  
*Department of Physics, Princeton University* *Princeton, NJ*

Directed the organizing committees and designed both onsite and online exams with challenging physics problems.

### Teaching Assistant

Phy 321 - Plan II Modern physics

📅 Spring 2023

*Honors Plan II course on particle physics*

*University of Texas at Austin*

Led discussion classes and supported the homework administration and grading. Taught three lectures on special relativity, principles of general relativity and the cosmic microwave background.

Phy 303k - General Physics II

📅 Spring 2023

*Introductory course in Electromagnetism for engineers*

*University of Texas at Austin*

Led discussion classes and supported the homework grading.

Phy 355 - Modern Physics

📅 Fall 2021 ▶ Spring 2022

*Introductory course in Quantum Mechanics, Statistical Mechanics and Special Relativity*

*University of Texas at Austin*

Led discussion classes and supported the homework administration and grading.

Phy 104 - Electromagnetism

📅 Spring 2021

*Introductory course in Electromagnetism*

*Princeton University*

Led discussion classes and supported the homework grading. Contributed to the revision process of a new textbook for the course by Professor Meyers.

Phy 102 - Electromagnetism

📅 Spring 2021

*Introductory course in Electromagnetism for pre-med students*

*Princeton University*

Supported the labs and homework administration and grading.

Phy 101 - Classical Mechanics

📅 Fall 2020

*Introductory course in Classical Mechanics for pre-med students*

*Princeton University*

Supported the labs and homework administration and grading.

### ⚙️ SKILLS & INTERESTS

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#### </> Digital Competence

Data Analysis in Python, Mathematica and C++; Machine Learning with Keras; Proficient user in  $\LaTeX$ .

#### 🗣️ Languages

Native Italian; Proficient English; Intermediate Spanish.

#### 🏹 Other Interests

Running; Italian Cooking; Motorcycle Riding; Backpacking; Acoustic Guitar.