

MARCOS M. FLORES PH.D.

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Citizenship: United States

EDUCATION

University of California: Los Angeles <i>Ph.D. in Physics</i>	Sept. 2019 - Sept. 2023 <i>Los Angeles, CA</i>
University of California: Los Angeles <i>M.S. in Physics</i>	Sept. 2018 - Sept. 2019 <i>Los Angeles, CA</i>
New Mexico Technical Institute of Mining and Technology <i>B.S. in Physics</i> <i>B.S. in Mathematics</i>	Aug. 2014 - May 2018 <i>Socorro, NM</i>

RESEARCH POSITIONS

Postdoctoral Researcher <i>Laboratoire de Physique de l'Ecole Normale Supérieure</i> <i>Advisor: Kalliopi Petraki</i>	Oct. 2023 – Present
Graduate Student Researcher <i>UCLA Department of Physics & Astronomy</i> <i>Advisor: Alexander Kusenko</i>	Sept. 2018 – Sept. 2023
Data Analyst <i>Langmuir Laboratory for Atmospheric Research</i> <i>Advisor: David J. Raymond</i>	May 2015 – May 2018
Student Researcher: Duke/TUNL REU <i>Duke University Department of Physics</i> <i>Advisor: Ayana T. Arce</i>	Summer 2017

PUBLICATIONS

“On the Role of Cosmological Gravitational Particle Production in Baryogenesis”

M. M. Flores, Y. F. Perez-Gonzalez
[arXiv:2404.06530 \[hep-ph\]](https://arxiv.org/abs/2404.06530) (2024), submitted to Phys. Rev. D

“New ideas on the formation and astrophysical detection of primordial black holes”

M. M. Flores, A. Kusenko
[arXiv:2404.05430 \[astro-ph.CO\]](https://arxiv.org/abs/2404.05430) (2024)
To appear in the book “Primordial Black Holes”, ed. Chris Byrnes, Gabriele Franciolini, Tomohiro Harada, Paolo Pani, Misao Sasaki; Springer (2024)

“Revisiting formation of primordial black holes in a supercooled first-order phase transition”

M. M. Flores, A. Kusenko, M. Sasaki
[arXiv:2402.13341 \[hep-ph\]](https://arxiv.org/abs/2402.13341) (2024), submitted to Phys. Rev. D

“Testing high scale supersymmetry via second order gravitational waves”

M. M. Flores, A. Kusenko, L. Pearce, Y. F. Perez-Gonzalez, G. White
[Phys. Rev. D 108, 123002 \(2023\)](#), [arXiv:2308.15522 \[hep-ph\] \(2023\)](#)

“Structure Formation after Reheating: Supermassive Primordial Black Holes and Fermi Ball Dark Matter”

M. M. Flores, Y. Lu, A. Kusenko
[Phys. Rev. D 108, 123511 \(2023\)](#), [arXiv:2308.09094 \[astro-ph.CO\] \(2023\)](#),

“G objects and primordial black holes”

M. M. Flores, A. Kusenko, A. M. Ghez, S. Naoz
[Phys. Rev. D 108, L061301 \(2023\)](#), [arXiv:2308.08623 \[astro-ph.CO\] \(2023\)](#),

“Defrosting and Blast Freezing Dark Matter”

M. M. Flores, C. Kouvaris, A. Kusenko
[Phys. Rev. D 108, 103545 \(2023\)](#), [arXiv:2306.04056 \[hep-ph\] \(2023\)](#)

“Gravitational waves from rapid structure formation on microscopic scales before matter-radiation equality”

M. M. Flores, A. Kusenko, M. Sasaki
[Phys. Rev. Lett. 131, 011003 \(2023\)](#), [arXiv:2209.04970 \[astro-ph.CO\] \(2022\)](#)

“Fireball baryogenesis from early structure formation due to Yukawa forces”

M. M. Flores, A. Kusenko, L. Pearce, G. White
[Phys. Rev. D 108 \(2023\) 9, 9](#) [arXiv:2208.09789 \[hep-ph\] \(2022\)](#)

“Primordial black holes as a dark matter candidate in theories with supersymmetry and inflation”

M. M. Flores and A. Kusenko
[JCAP 05 \(2023\) 013](#), [arXiv:2108.08416 \[hep-ph\]](#)

“Spins of primordial black holes formed in different cosmological scenarios”

M. M. Flores and A. Kusenko
[Phys. Rev. D 104, 063008 \(2021\)](#), [arXiv:2106.03237 \[astro-ph.CO\]](#)

“Primordial black holes from long-range scalar forces and scalar radiative cooling”

M. M. Flores and A. Kusenko
[Phys. Rev. Lett. 126, 041101 \(2021\)](#), [arXiv:2008.12456 \[astro-ph.CO\]](#)

“Predicting convective rainfall over tropical oceans from environmental conditions”

D. J. Raymond and M. M. Flores
[Journal of Advances in Modeling Earth Systems 8 \(2\), 703-718 \(2016\)](#)

TALKS

“Long-range forces and the early universe: primordial black holes and gravitational waves”

Institute for Particle Physics Phenomenology Seminar, Durham University
14, March 2024
Durham University, Durham, UK

“Primordial black holes and gravitational waves from long-range scalar forces”

Paris workshop on primordial black holes and gravitational waves

28, Nov. 2023

Institut Henri Poincaré, Paris, France

“Primordial black holes and gravitational waves from long-range scalar forces”

Focus Week on Primordial Black Holes

14, Nov. 2023

Kavli IPMU

“Primordial black holes and gravitational waves from long-range scalar forces”

IRN Terascale @ Marseille

27, Oct. 2023

Aix-Marseille Université, Luminy

“Primordial black holes and gravitational waves from long-range scalar forces”

Joint Particle Seminar

16, Nov. 2022

UC Irvine

“Primordial black holes and gravitational waves from long-range scalar forces”

High Energy Physics Seminar

7, Nov. 2022

Caltech

“Primordial black holes and gravitational waves from long-range scalar forces”

Santa Cruz Institute for Particle Physics Seminar

25, Oct. 2022

UC Santa Cruz

“Primordial black holes and long-range scalar forces”

Northwestern CIERA Science Happy Hour

13, May 2022

Remote

“Fermion asymmetries and dark matter in the form of primordial black holes”

High-Scale Baryogenesis Workshop – Kavli IPMU

13, Jan. 2022

Remote

“Primordial Black Holes and the Galactic Center”

The 5th Annual Galactic Center Orbits Initiative Winter Workshop

14, Dec. 2021

UCLA Department of Physics & Astronomy

“Primordial Black Holes from long-range scalar forces and scalar radiative cooling”

The 4th Journal Club for PBH - Macro Dark Matter IPMU Group

1, Dec. 2021

Remote

“Primordial Black Holes from long-range scalar forces and scalar radiative cooling”

The 3rd KEK-PH + 1st KEK-Cosmo Joint Workshop on “Primordial Black Holes”
19, Oct. 2021
Remote

“Supersymmetric flat directions and formation of primordial black holes”

The XXVIII International Conference on Supersymmetry and Unification of Fundamental Interactions
23, Aug. 2021
Remote

“Primordial black holes as a natural dark matter candidate in supersymmetry”

The XXVIII International Conference on Supersymmetry and Unification of Fundamental Interactions
22, Aug. 2021
Remote

“Study of charged particle distributions in gluon-enriched jet samples”

Duke University/TUNL REU 2017 Research Symposium
4, Aug. 2017
CERN

“Comparative analysis of convective rainfall model to global analyses”

New Mexico Tech Student Research Symposium
7, April 2016
New Mexico Tech

TEACHING

Lecturer <i>UCLA Department of Physics & Astronomy</i> Lower Division Course: Physics for Scientists and Engineers	Summer 2023
Teaching Assistant Consultant (TAC) <i>UCLA Department of Physics & Astronomy</i>	Sept. 2020 - Sept. 2023
Teaching Fellow <i>UCLA Department of Physics & Astronomy</i> Upper Division Courses: Particle Physics, Electronics for Physical Measurements Lower Division Courses: Physics for Scientists and Engineers, Physics Lab for Life Sciences Majors	Sept. 2018 - Sept. 2023
Teaching Assistant <i>New Mexico Tech Department of Mathematics</i> Lower Division Courses: Calculus I Discussion, Trigonometry Discussion	Aug. 2015 - May 2016

FELLOWSHIPS AND AWARDS

Fellowships & Scholarships	
University of California Office of the President Dissertation Year Fellowship	2022 - 2023
UCLA Physics Division Fellowship	2018 - 2023
New Mexico Legislative Lottery Scholarship	2014 - 2018
New Mexico Tech Silver Scholarship	2014 - 2018

Awards

UCLA Physics & Astronomy Outstanding Teaching Award	2019 - 2020
Abraham & Ester Brook Award in Physics, New Mexico Tech	2017

OUTREACH

UCLA Marginalized Identities in Physics & Astronomy	2020 – 2023
Graduate Student Mentor	
Letters to a Pre-Scientist	2021 – 2023
Scientist Pen-Pal/Mentor	
Skype a Scientist	2021 – 2023
Scientist Volunteer	