Marcell Howard

Curriculum Vitae

PERSONAL DETAILS

Address	3941 O'Hara Street, Pittsburgh, PA 15260 USA
Mail	mah455[at]pitt.edu
Website	https://marcellhoward.github.io/
ORCID ID	0000-0001-5384-132X

EDUCATION

University of Pittsburgh, Pittsburgh, PA *2019 - Present*
Ph.D., Physics

Case Western Reserve University, Cleveland, OH *2015 - 2019*
B.S., Mathematics and Physics

PREDOCTORAL RESEARCH EXPERIENCE

Graduate Research Assistant *2020 - Present*
University of Pittsburgh advised by Arthur Kosowsky
Doctoral Thesis: Issues of Gravitation in Cosmology

Senior Project *2018 - 2019*
Case Western Reserve University advised by Kurt Hinterbichler
Honor's Thesis: The People vs Mimetic Gravity

Research Experience for Undergraduates *Summer 2018*
Rutgers, the State University of New Jersey advised by Andrew Baker
Probing the Evolution of Galaxies Using Stellar Mass Selected Samples

Research Experience for Undergraduates *Summer 2017*
Cornell University advised by Gordon Stacey
Using Far-Infrared Fine-Structure Lines for Characterizing Star Formation Processes in Nearby Galaxies

PUBLICATIONS LIST

M. Howard and M. König, *Elastic Scattering of Cosmological Gravitational Wave Backgrounds: Primordial Black Holes and Stellar Objects*, *arXiv e-prints* (2023) arXiv:2309.15925 [2309.15925]

T. Daniel, M. Howard and M. Konig, *An SZ-Like Effect on Cosmological Gravitational Wave Backgrounds*, *arXiv e-prints* (2023) arXiv:2308.00111 [2308.00111]

S. Alexander, T. Daniel, M. Howard and M. König, *Exact fermionic Chern-Simons-Kodama state in quantum gravity*, Phys. Rev. D **106** (2022) 106012 [2207.11856]

M. Howard, A. Kosowsky and G. Valogiannis, *Galaxy Cluster Statistics in Modified Gravity Cosmologies*, *arXiv e-prints* (2022) arXiv:2205.13015 [2205.13015]

TEACHING EXPERIENCE

Graduate Core Course Tutor
PHYS 2565: Non-Relativistic Quantum Mechanics 1
PHYS 2566: Non-Relativistic Quantum Mechanics 2
PHYS 1373 & 2373 (Combined section): Mathematical Methods in Physics

- Held two office hours per week.
- Provided homework help as well as furthered conceptual understanding of the material.

Graduate Teaching Assistant
PHYS 0111: Introduction to Physics 2
PHYS 0174: Basic Physics for Science and Engineering 1
PHYS 0175: Basic Physics for Science and Engineering 2
PHYS 0212: Introduction to Laboratory Physics

- Held two-four recitation sessions per week.
- Graded quizzes and tests.

Undergraduate Supplemental Instructor
MATH 121: Calculus for Scientists and Engineers I
MATH 122: Calculus for Scientists and Engineers II

- Held three small groups and one recitation session per week.
- Graded quizzes and tests.

Undergraduate Teaching Assistant
PHYS 121: General Physics I - Mechanics
PHYS 122: General Physics II - Electricity and Magnetism

- Graded written homework handed in every week.
- Handed out in-class assignments and provided help to various students.

TALKS AND POSTER PRESENTATIONS

Syracuse University Colloquium *Nov 2023*
Current and Future Constraints on Primordial Black Holes as Dark Matter Candidates
Invited talk

Syracuse University, Watson Cosmology Group Seminar *Nov 2023*
The Gravitational Sunyaev-Zeldovich Effect as a Probe of Primordial Black Holes as Dark Matter Candidates
Invited talk

National Society of Black Physicists Conference *Nov 2023*
The Gravitational Sunyaev-Zeldovich Effect as a Probe of Primordial Black Holes as Dark Matter Candidates
Contributed talk

28th International Symposium on Particles, Strings, and Cosmology (PASCOS) *June 2023*
An SZ-Like Effect On Stochastic Gravitational Wave Backgrounds
Invited talk

Simons Center for Geometry and Physics, Ending Inflation and the Hot Big Bang Workshop *June 2023*
An SZ-Like Effect On Stochastic Gravitational Wave Backgrounds
Invited talk

American Physical Society April Meeting 2023 *Apr 2023*
An SZ-Like Effect On Stochastic Gravitational Wave Backgrounds
Contributed talk

Pennsylvania State University, Neighborhood Workshop *Apr 2023*
An SZ-Like Effect On Stochastic Gravitational Wave Backgrounds
Contributed talk

Massachusetts Institute of Technology, String Theory Group Meeting *Feb 2023*
An Exact Fermionic Chern-Simons-Kodama State in Quantum Gravity
Invited talk

National Society of Black Physicists Conference *Nov 2022*
An Exact Fermionic Chern-Simons-Kodama State in Quantum Gravity
Contributed talk

Case Western Reserve University, Particle Astrophysics Seminar *Sep 2022*
An Exact Fermionic Chern-Simons-Kodama State in Quantum Gravity
Invited talk

NEXUS Summer Workshop *Aug 2022*
An Exact Fermionic Chern-Simons-Kodama State in Quantum Gravity
Contributed talk

American Physical Society April Meeting 2022 *Apr 2022*
Galaxy Cluster Statistics in Modified Gravity Cosmologies
Contributed talk

Brown University, Alexander Lab Group Meeting *Mar 2022*
Galaxy Cluster Statistics in Modified Gravity Cosmologies
Invited talk

National Society of Black Physicists Conference *Nov 2021*
Galaxy Cluster Statistics in Modified Gravity Cosmologies
Contributed talk

American Astronomical Society Meeting (Seattle, WA) *Jan 2019*
Probing the Evolution of Galaxies Using Stellar Mass Selected Samples
Contributed poster

Rutgers, the State University of New Jersey, REU Presentation *Aug 2018*
Probing the Evolution of Galaxies Using Stellar Mass Selected Samples
Contributed poster and talk

Cornell University, REU Presentation *Aug 2017*
Using Far-Infrared Fine-Structure Lines for Characterizing the Star Formation Processes in Nearby Galaxies
Contributed poster and talk

OUTREACH AND SERVICE

Python Boot Camp 2023: Functions and Modules *May 2023*
University of Pittsburgh
Volunteer Presenter

Astronomy on Tap NYC *May 2023*
Pete's Candy Store
Invited talk

International Baccalaureate Class Group Project *Mar 2023*
St Edward High School
Invited speaker

Seminar at High School (SAHS) and Pathway Career Speaker Series *Dec 2022*
Woodland Hills High School

Invited speaker

Society of Physics Students Graduate Student Panel *Oct 2022*
University of Pittsburgh
Panel contributor

Astronomy on Tap *Sept 2022*
Two Fray's Brewery
Contributed talk

Summer Seminar Series: So You Wanna Get Good At LaTeX *July 2022*
University of Pittsburgh
Contributed talk

Cornell's Focus for Teens *Summer 2017*
Cornell University
Workshop Leader

SCHOOLS PARTICIPATED

39th Advanced School in Theoretical Physics on Geometry, Topology and Mechanics in Soft Condensed Matter *January 2024*
Israel Institute for Advanced Study

SKILLS

Programming Languages	Python, Mathematica, Matlab
Software	SciPy/matplotlib, AstroPy, git

PROFESSIONAL ORGANIZATIONS

Pittsburgh Particle Astrophysics and Cosmology Center (PITT PACC) *2020 - Present*

National Society of Black Physicists *2018 - Present*

FELLOWSHIPS, SCHOLARSHIPS AND AWARDS

Peter F.M. Koehler Pre-Doctoral Fellowship *2023*

2021 Honorable Mention, Ford Foundation Predoctoral Fellowship *2021*

Dietrich School of Arts and Sciences Summer Research Predoctoral Fellowship *2020*

Kenneth P. Dietrich School of Arts & Sciences Fellowship *2019*

Hayden Scholarship *2017*

Gaemsslen Grant Fund *2017*

Case Alumni Junior/Senior Scholarship *2017*

University Scholarship *2015*

CWRU Grant *2015*