

Cynthia Arias

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Personal Information

Citizenship: Ecuadorian.

Education

2022–2026 [†] Ph.D., Theoretical Physics and Astrophysics, Charles University, Czech Republic.

Research Topic: Hidden Symmetries and Black Holes Chemistry.

Supervisor: David Kubiznak, Ph.D.

2021–2022 M.Sc., Theoretical Physics, Perimeter Institute and University of Waterloo, Canada.

Thesis Title: Distinguishing Primordial from Astrophysical Black Holes via Stochastic Gravitational Wave Background.

Supervisors: Suvodip Mukherjee, Ph.D. and Daniel Siegel, Ph.D.

2015–2020 B.Sc., Physics, Yachay Tech University, Ecuador.

Thesis Title: Anisotropic interior solutions and the Buchdahl's limit in the context of gravitational decoupling.

Supervisor: Ernesto Contreras, Ph.D.

Research Experience

Research Groups

Strong Gravity Research Group, Perimeter Institute.

Junior Research Affiliate at Wolfram Physics Project.

Member of the research group "Water Y". Yachay Tech University.

Research Projects

2022	Study on differentiating primordial from astrophysical black holes via stochastic gravitational waves background. Master's thesis project, Perimeter Institute.
2022	Inferring cosmic expansion from gravitational waves observations. Winter School at Perimeter Institute.
2021	Vanishing complexity and anisotropic stars, School of Physics, Yachay Tech.
2021	Geodesic motion around hairy black holes, School of Physics, Yachay Tech.
2020	Karmarkar Polytropes, School of Physics, Yachay Tech.
2020	A Path to Higher Order Corrections for Einstein's Equations, Wolfram Physics Project.
2019–2020	Extra packing of mass of anisotropic interiors induced by MGD, School of Physics, Yachay Tech.
2019	Reduced and Oxide Graphene Coatings on Copper Surfaces (experimentally), Nanotechnology Laboratory, Yachay Tech.
2018	Third Harmonic Generation Optimization, Attosecond Laboratory at IBS, Gwangju Institute of Science and Technology.

Work Experience

2022	Research Assistant at University of Guelph and Perimeter Institute, Canada.
2020	Junior Research Affiliate at Wolfram Physics Project.
2018	Internship (Global Intern Program), Photonics, Gwangju Institute of Science and Technology (GIST).

Teaching Experience

2022	Lecturer of Physics leveling course, Yachay Tech.
2022	Tutor of Physics II, Yachay Tech.
2022	Instructor at Winter School in Gravitational Waves, Yachay Tech
2019	Instructor, Mathematics, "Victor Manuel Guzmán" High School.
2017	Instructor, Physics, Imantag Milenial School.

Selected Honours and Awards

- 2021 Perimeter Scholars International Award, Canada.
- 2020 Hult Prize On Campus (Yachay Tech), First place award to "Water-Y".
- 2018 Mushuna at Yachay Tech, Award to "Water-Y" for the best social-scientific entrepreneurship.
- 2018 Gwangju Institute of Science and Technology, GIP 2018 scholarship.
- 2018 Open Future Telefonica, Award to "Water-Y" for the best solution to water problems in agriculture.

Publications

- [1] Arias, C., Tello-Ortiz, F. Contreras, E. Extra packing of mass of anisotropic interiors induced by MGD. *Eur. Phys. J. C* 80, 463 (2020).
- [2] Ramos, A., Arias, C., Fuenmayor, E. et al. Class I polytropes for anisotropic matter. *Eur. Phys. J. C* 81, 203 (2021).
- [3] Ramos, A., Arias, C., Avalos, R., Contreras, E. Geodesic motion around hairy black holes. *Annals of Physics*, Volume 431, (2021).
- [4] Arias, C., Contreras, E., Fuenmayor, E., Ramos, A. Anisotropic star models in the context of vanishing complexity. *Annals of Physics*, Volume 436, (2022).

Research Posters

- [1] **Water Y.**, Arias, C., Chipantiza, C., Garzón, D., Sánchez, N., Sommer, A., & Zamora, C., (2018). Graphene Oxide (GO) to Improve Water Condensation. Poster session presented at the 2018 Enhanced Oil Recovery Symposium, Yachay Tech University, Urcuquí, Ecuador.
- [2] **GIP 2018.**, Arias, C., Kim, K., & Shin, J. (2018). Optimization of Third Harmonic Generation. Poster session presented at the Completing Ceremony of GIP 2018, Gwangju Institute of Science and Technology, Gwangju, South Korea.

References

- David Kubiznak, Ph.D, Associate Professor at Charles University. Contact: david.kubiznak@mff.cuni.cz
- Daniel Siegel, Ph.D, Associate Faculty. Perimeter Institute and University of Guelph. Contact: dsiegel@perimeterinstitute.ca
- Ernesto Contreras, Ph.D, Professor at Universidad San Francisco de Quito. Contact: econtreras@usfq.edu.ec
- Carlos Reinoso, Ph.D, Professor at Yachay Tech. Contact: creinoso@yachaytech.edu.ec
- Kyung Taek Kim, PhD, Assistant Professor, Department of Physics and Photon Science. Contact: kyungtaec@gist.ac.kr

Google Scholar Profile

<https://scholar.google.com/citations?user=NunVdlwAAAAJ&hl=en>