PAULO MONTERO-CAMACHO

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Citizenship: Costa Rican

RESEARCH INTERESTS

Cosmic Reionization — Lyman-α Forest — 21cm cosmology — CMB Polarization — Warm Dark Matter — Primordial Black Holes – Baryon Acoustic Oscillations — Exoplanets Atmospheres — Applications of Atomic Polarizations/Quantum Mechanics in Astrophysics
Methodologies: Numerical Simulations — Bayesian Statistics — Forecasting — Symbolic Regression – AI for astronomy

EMPLOYMENT

Peng Cheng Laboratory, Shenzhen, China 2022-
Assistant Researcher at the Department of Mathematics and Theory
Tsinghua University, Beijing, China 2019-2022
Postdoctoral Researcher and Shiumu Scholar at the Department of Astronomy

EDUCATION

Ph.D., Physics, The Ohio State University, Columbus OH 2019
Advisor: Christopher M. Hirata
M.Sc., Physics, The Ohio State University, Columbus OH 2016
B.Sc., Physics with honors, University of Costa Rica, San José 2013

AWARDS/GRANTS

NSFC Research Fund for International Young Scientists (Grant ≈ $30000/year) 2020
Tsinghua Shui Mu Scholarship 2019 - 2022
First place at Stanford Linear Accelerator Summer Institute 2017
University of Costa Rica research scholarship 2010 - 2013
University of Costa Rica TA scholarship 2010 - 2012
University of Costa Rica scholarship of excellence for incoming students 2009

PUBLICATIONS

Summary: 21 total, 10 refereed publications, 7 submitted, 2 conference proceedings, 2 white papers, 8 first author, 430 citations, 10 h-index, * indicates advised/mentored student
Refereed Publications:

17. DESI collaboration, including **Montero-Camacho, P.**, (2023). Broad Absorption Line Quasars in the Dark Energy Spectroscopic Instrument Early Data Release. *Submitted to MNRAS*, arXiv:2309.03434
16. DESI collaboration, including **Montero-Camacho, P.**, (2023). 3D Correlations in the Lyman-α Forest from Early DESI Data. *Submitted to JCAP*, arXiv:2308.10950
15. **Montero-Camacho, P.**, *Zhang, Y,, and Mao, Y., (2023). The long-lasting effect of X-ray preheating in the post-reionization intergalactic medium. *Submitted to MNRAS*, arXiv:2307.10598
14. Ramírez-Pérez, C, *et al.*, including **Montero-Camacho, P.**, (2023). The Lyman-alpha forest catalog from the Dark Energy Spectroscopic Instrument Early Data Release. *Submitted to MNRAS*, arXiv:2306.06312
13. DESI collaboration, including **Montero-Camacho, P.**, (2023). The Early Data Release of the Dark Energy Spectroscopic Instrument. *Submitted to The Astronomical Journal*, arXiv:2306.06308
12. DESI collaboration, including **Montero-Camacho, P.**, (2023). Validation of the Scientific Program for the Dark Energy Spectroscopic Instrument. *Submitted to The Astronomical Journal*, arXiv:2306.06307
11. *Long, H., *Morales-Gutiérrez, C., **Montero-Camacho, P.**, and Hirata, C. M., (2022). Impact of inhomogeneous reionization on post-reionization 21 cm intensity mapping measuring of cosmological parameters. *Submitted to MNRAS*, arXiv:2210.02385

10. DESI collaboration, including **Montero-Camacho, P.**, (2023). The DESI Survey Validation: Results from Visual Inspection of the Quasar Survey Spectra. *The Astronomical Journal*, **165** (3), arXiv:2208.08517
9. **Montero-Camacho, P.**, *Liu, Y., and Mao, Y., (2023). Separating the memory of reionization from cosmology in the Lyα forest power spectrum at the post-reionization era. *Monthly Notices of the Royal Astronomical Society*, **stad437**, arXiv:2207.09005
8. DESI collaboration, including **Montero-Camacho, P.**, (2022). Overview of the Instrumentation for the Dark Energy Spectroscopic Instrument. *The Astronomical Journal*, **164** (5), arXiv:2205.10939
7. **Montero-Camacho, P.** and Mao, Y., (2021). Extracting the astrophysics of reionization from the Lyα forest power spectrum: a first forecast. *Monthly Notices of the Royal Astronomical Society*, **stab2569**, arXiv:2106.14492
6. **Montero-Camacho, P.** and Mao, Y., (2020). Lyα forest power spectrum as an emerging window into the epoch of reionization and cosmic dawn. *Monthly Notices of the Royal Astronomical Society,* **staa2918**, arXiv:2003.10077
5. Oklopčić, A., *Silva, M., **Montero-Camacho, P.**, and Hirata, C. M., (2020). Detecting Magnetic Fields in Exoplanets with Spectropolarimetry of the Helium Line at 1083 nm. *The Astrophysical Journal*, **890** (1), arXiv:1910.02504
4. **Montero-Camacho, P.**, Fang, X., *Vasquez, G., *Silva, M., and Hirata, C. M., (2019). Revisiting constraints on asteroid-mass primordial black holes as dark matter candidates. *Journal of Cosmology and Astroparticle Physics*, **08** 031, arXiv:1906.05950
3. **Montero-Camacho, P.**, Hirata, C. M., Martini, P., and Honscheid, K., (2019). Impact of inhomogeneous reionization in the Lyman-α forest. *Monthly Notices of the Royal Astronomical Society*, **stz1388**, arXiv:1902.02892
2. **Montero-Camacho, P.** and Hirata, C. M., (2018). Exploring circular polarization in the CMB due to conventional sources of cosmic birefringence. *Journal of Cosmology and Astroparticle Physics*, **08**, 040, arXiv:1803.04505
1. Frutos-Alfaro, F., **Montero-Camacho, P.**, Araya, M. and Bonatti-Gonzalez, J. (2015). Approximate metric for a rotating deformed mass. *International Journal of Astronomy and Astrophysics*, **5**, 1-10, arXiv:1405.1776

Conference Proceedings & White Papers:

4. Han, J. J., *et al.*, including **Montero-Camacho, P.**, (2023). NANCY: Next-generation All-sky Near-infrared Community surveY., arXiv:2306.11784
3. Valluri, M., Chabanier, S., Irsic, V., Armengaud, E., Walther, M., Rockosi, C., Sanchez-Conde, L., Cooper, A., Darragh-Ford, E., Dawson, K., Deason, A., Ferraro, S., Forero-Romero, J., Garzilli, A., Li, T., Lukick, Z., Manser, C., Palanque-Delabrouille, N., Ravoux, C., Tan, T., Wang, W., Weschler, R., Carrilo, A., Dey, A., Koposov, S., Mao, Y-Y, **Montero-Camacho, P.**, Patel, E., Rossi, G., Urena-Lopez, A., and Valenzuela, O., (2022). Snowmass2021 cosmic frontier white paper: Prospects for obtaining dark matter constraints with DESI., arXiv:2203.07491
2. Frutos-Alfaro, F., Gómez-Ovares, P., and **Montero-Camacho, P.**, (2020). Approximate Kerr-Newman-like metric with quadrupole. *Revista de Matemática: Teoría y Aplicaciones*, **28** (2):295-310. Local Costa Rican journal
1. **Montero-Camacho, P.**, Frutos-Alfaro, F., Gutierrez-Chaves, C. and Cordero-Garcia, I., (2015). Slowly rotating curzon-chazy metric. *Revista de Matemática: Teoría y Aplicaciones*, **22** (2):265-274. Local Costa Rican journal

PRESENTATIONS

Summary: 30 presentations, 13 invited talks

30.	Invited Talk, PMO Seminar, Purple Mountain Observatory, Nanjing, China	02/2023
29.	Invited Talk, KIAA-DoA Seminar, Peking University, Beijing, China	02/2023
28.	Invited Talk, Astronomy Colloquium, Beijing Normal University, Beijing, China	02/2023
27.	Invited Talk, DoA Colloquium, Tsinghua University, Beijing, China	12/2022
26.	Contributed Talk, ACAMAR meeting on Astroparticle Physics, online conference	06/2022
25.	Invited Talk, SWIFAR Colloquium, Yunnan University, Yunnan, China	04/2022

24. Recorded Talk, Sazerac 21cm 2022, online conference 03/2022
23. Invited talk, LBNL Colloquium, UC Berkeley, CA 01/2022
22. Invited talk, SUSY Department of Astronomy Colloquium, Zhuhai, Guangzhou, China 01/2022
21. Contributed Poster, 4th Global 21cm Workshop, online conference 10/2021
20. Invited Talk, α-CEN Summer School 2021, online summer school 08/2021
19. Contributed Talk, Guo Shoujing Meeting Zhejiang University, Hangzhou, China 05/2021
18. Recorded Talk, Sazerac 21cm sip, online conference 01/2021
17. Contributed Talk, α-Cen 2020 Annual Meeting, online conference 12/2020
16. Contributed Talk, Guo Shoujing Meeting SYSU Zhuhai, Guangdong, China 11/2020
15. Recorded Talk, Sazerac online conference 07/2020
14. Invited Talk, DoA Cosmology Journal Club, Beijing, China 10/2019
13. Invited Talk, UCR Department of Physics Colloquium, San Jose, Costa Rica 02/2019
12. Contributed Talk, Caltech Cosmology Journal Club, Pasadena, CA 10/2018
11. Contributed Talk, CMU Astro Lunch, Pittsburgh, PA 10/2018
10. Invited Talk, OSU CCAPP Summer Seminar, Columbus, OH 07/2018
9. Contributed Talk, APS April Meeting 2018, Columbus, OH 04/2018
8. Contributed Poster, 48^{th} Saas-Fee course, Saas-Fee, Switzerland 01/2018
7. Contributed Talk, VII Essential Cosmology for the Next Generation, Punta Mita, Mexico 12/2017
6. Contributed Poster, COSMO-17, Paris, France 08/2017
5. Talk (First place Award), SLAC Summer Institute 2017, Palo Alto, CA 08/2017
4. Contributed Poster, SLAC Summer Institute 2017, Palo Alto, CA 08/2017
3. Invited Talk, UCR Department of Physics Colloquium, San José, Costa Rica 12/2016
2. Invited Talk, UCR Department of Physics Colloquium, San José, Costa Rica 06/2014
1. Contributed Talk, XIX SIMMAC, San José, Costa Rica 02/2014

ADVISING, TEACHING, WORK EXPERIENCE AND SERVICE

Advised and coached students:

Yifan Zheng — Tsinghua University, Undergraduate student, 2022-
Yao Zhang — Tsinghua University, Graduate student, 2022-
Yao Zhang — Fudan University, Undergraduate student, 2021-2022
Yuchen Liu — University College London (UCL), Visiting student, 2021-2022
Catalina Morales-Gutierrez — Universidad de Costa Rica (UCR), Undergraduate student, 2021-
Heyang Long — The Ohio State University (OSU), Graduate student, 2020-
Makana Silva — OSU, Graduate student, 2018-2021
Gabriel Vasquez — OSU, Graduate student, 2018-2019

Work experience and Service:

MUST Cosmology Working Group member (2023-)
MUST Science Working Group member (2023-)
DESI-DEI committee member (2022-)
DESI member (2021-)
Referee for *Journal of Cosmology and Astroparticle Physics*
Referee for *Monthly Notices of the Royal Astronomical Society*
Coordinator, Astro Coffee, Tsinghua University (2020-)
Volunteer, Friends of Ohio State Astronomy and Astrophysics, OSU (2018)
Coordinator, Physics Graduate Open House, OSU (2018)
Volunteer, TeVPA 2017 Conference, OSU (2017)
Volunteer, OSC Summer Institute, OSU (2017)
Coordinator, Cosmolunch Journal Club, CCAPP, OSU (2016-2019)
Research Assistant, CCAPP & OSU (2016-2019)
Research Assistant, Astrophysics section, UCR (2012-2014)
Undergraduate Research Assistant, Condensed Matter section, UCR (2012-2013)
Undergraduate Research Assistant, Theoretical Physics section, UCR (2012-2013)

Volunteer, TC-525: Astronomy and its Applications, UCR (2011)
Undergraduate Research Assistant, Astrophysics section, UCR (2010-2012)

Diversity and Inclusion:
Outreach talk for "24 hours of Astronomy" 2023 (University of Costa Rica), *Understanding 25% of the Universe, Primordial black holes as dark matter candidates*
Lecturer in a summer school for students from Central America & the Caribbean
Published a report in Nature Portfolio on the Status of Astronomy in Central America and the Caribbean
Mentor of Central American-Caribbean Bridge program in Astrophysics (2021-)
Member of α-cen (2020-)
Bridge program mentor, Department of Physics, OSU (2017-2019)

Teaching:
Teaching Assistant, Physics 1251: E&M, Optics, Modern Physics at OSU (2015-2016)
Teaching Assistant, Intermediate Mechanics at OSU (2014-2015)
Lecturer, General Physics II: Electrostatics, Thermodynamics, and Waves at UCR (2013-2014)
Teaching Assistant, E&M I: Electrostatics at UCR (2013)
Teaching Assistant, Mathematical methods for physicists III at UCR (2012)
Teaching Assistant, Physics III: E&M, Modern Physics, and Optics at UCR (2010-2012)

REFERENCES

Prof. Christopher M. Hirata *hirata.10@osu.edu*
Department of Physics and Astronomy, The Ohio State University

Prof. Yi Mao *ymao@tsinghua.edu.cn*
Department of Astronomy, Tsinghua University

Prof. Antonija Oklopčić *a.oklopcic@uva.nl*
Anton Pannekoek Institute for Astronomy, University of Amsterdam

Prof. Zheng Cai *zcai@mail.tsinghua.edu.cn*
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