

# Henry Monge-Camacho

## Education

B.A. Physics, University of Costa Rica, 2003-2008.

M.S. Physics, College of William and Mary, 2014-2016.

Ph.D. Physics, College of William and Mary, 2016-2019.

## Work Experience

- Postdoctoral Research Associate, Oak Ridge National Laboratory, USA, April 2022-present
- Visiting Professor, Universidad de Costa Rica, Costa Rica, 2020-April 2022
- Postdoctoral Research Associate, University of North Carolina at Chapel Hill, 2018-2020
- PhD student, College of William and Mary, 2014-2018
- Firearms and tool marks examineer, Forensic Sciences Departament, OIJ, Poder Judicial, Costa Rica, 2008-2014 .

## Skills and techniques:

### Software and programming:

- Programming Languages: Python, Java, C, C++, MatLab
- Scientific Visualization tools: medium level usage of ParaView (VTK based software)
- Forensic sciences software: basic level usage of BATvox (voice biometric tool designed for forensics experts) and medium level usage of IBIS (Integrated Ballistics Identification System)

## Languages

Fluent languages: Spanish (mother language), English, Swedish

Basic reading and writing: German, Italian.

## Research Experience

I have conducted research in numerical analysis in the field of Magnetohydrodynamics, which was applied to Solar phenomena. However, my most recent research has been focused on Quantum Chromodynamics. I have been working specifically on computational calculations of nuclear matrix elements relevant to low energy nuclear physics processes using Lattice QCD.

## Teaching Experience

Astronomy Laboratory, Spring Semester 2015.

Electromagnetism I, Fall 2020, Fall 2021.

Electromagnetism II, Spring 2021.

General Physics II Laboratory Fall 2020, Spring 2021.

General Physics for Phycists II Fall 2021.

General Physics III Fall 2020.

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General Physics for Physicists III summer 2021.

## Publications

### Papers

1. Toward a resolution of the NN controversy, Amy Nicholson, Evan Berkowitz, John Bulava, Chia Cheng Chang, M.A. Clark, Andrew D. Hanlon, Ben Horz, Dean Howarth, Christopher Korber, Wayne Tai Lee, Aaron S. Meyer, Henry Monge-Camacho, Colin Morningstar, Enrico Rinaldi, Pavlos Vranas, Andre Walker-Loud. In 38th International Symposium on Lattice Field Theory (2021). In arXiv: 2112.04569 [hep-lat].
2. Nucleon Axial Form Factor from Domain Wall on HISQ, Aaron S. Meyer, Evan Berkowitz, Chris Bouchard, Chia Cheng Chang, M.A. Clark, Ben Hörz, Dean Howarth, Christopher Körber, Henry Monge-Camacho, Amy Nicholson, Enrico Rinaldi, Pavlos Vranas, André Walker-Loud. . In 38th International Symposium on Lattice Field Theory (2021). In arXiv: 2111.06333 [hep-lat].
3. Detailed analysis of excited state systematics in a lattice QCD calculation of  $g_A$ , Jinchen He, David A. Brantley, Chia Cheng Chang, Ivan Chernyshev, Evan Berkowitz, Dean Howarth, Christopher Körber, Aaron S. Meyer, Henry Monge-Camacho, Enrico Rinaldi, Chris Bouchard, M.A. Clark, Arjun Singh Gambhir, Christopher J. Monahan, Amy Nicholson, Pavlos Vranas, André Walker-Loud (2021). In arXiv: 2104.05226 [hep-lat].
4. Scale setting the Möbius Domain Wall Fermion on gradient-flowed HISQ action using the omega baryon mass and the gradient-flow scale  $w_0$ , Nolan Miller, Logan Carpenter, Evan Berkowitz, Chia Cheng Chang, Ben Hörz, Dean Howarth, Henry Monge-Camacho, Enrico Rinaldi, David A. Brantley, Christopher Körber, Chris Bouchard, M.A. Clark, Arjun Singh Gambhir, Christopher J. Monahan, Amy Nicholson, Pavlos Vranas and André Walker-Loud. In: Phys. Rev. D 103.5, p.054511. doi:10.1103/PhysRevD.103.054511. arXiv: 2011.12166 [hep-lat]
5. N. Miller, H. Monge-Camacho, C. C. Chang, B. Hörz, E. Rinaldi, D. Howarth, E. Berkowitz, D. A. Brantley, A. Singh Gambhir, C. Körber, C. J. Monahan, M. A. Clark, B. Joó, T. Kurth, A. Nicholson, K. Orginos, P. Vranas, A. Walker-Loud (2020). "FK/ $F\pi$  from Möbius Domain-Wall fermions solved on gradient-flowed HISQ ensembles". Phys.Rev.D 102 (2020) 3, 034507, In: arXiv:2005.04795 [hep-lat]
6. A. Walker-Loud et al. (2020). "Lattice QCD Determination of  $g_A$ ". In: PoS CD2018, p. 020. doi: 10.22323/1.317.0020. arXiv: 1912.08321[hep-lat]
7. H. Monge-Camacho et al. (2019). "Short Range Operator Contributions to neutrinoless double beta decay from LQCD". In: PoS LATTICE2018, p. 263. doi:10.22323/1.334.0263. arXiv: 1904.12055 [hep-lat]
8. A. Nicholson et al. (Dec. 2018). "Symmetries and Interactions from Lattice QCD". In: 13<sup>th</sup> conference on the Intersections of Particle and Nuclear Physics. arXiv: 1812.11127 [hep-lat]
9. E. Berkowitz et al. (2018). "Progress in Multibaryon Spectroscopy". In: PoS LATTICE2018, p. 003. doi: 10.22323/1.334.0003. arXiv: 1902.09416 [hep-lat]

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10. C. Chang et al. (2018). "A per-cent-level determination of the nucleon axial coupling from quantum chromodynamics". In: Nature 558.7708, pp. 91–94. doi: 10.1038/s41586-018-0161-8. arXiv: 1805.12130[hep-lat]
11. A. Nicholson et al. (2018). "Heavy physics contributions to neutrinoless double beta decay from QCD". In: Phys. Rev. Lett. 121.17, p. 172501. doi: 10.1103/PhysRevLett.121.172501. ArXiv: 1805.02634 [nucl-th]
12. H. J. Monge Camacho (2018). "Lattice QCD for Neutrinoless Double Beta Decay: Short Range Operator Contributions". PhD thesis. William-Mary Coll. doi: 10.21220/s2-keqm-c011
13. C. C. Chang et al. (2018). "Nucleon axial coupling from Lattice QCD". In: EPJ Web Conf. 175, p.01008. doi:10.1051/epjconf/201817501008. arXiv: 1710.06523 [hep-lat]
14. D. A. Brantley, B. Joo, E. V. Mastropas, E. Mereghetti, H. Monge-Camacho, B. C. Tiburzi, and A. Walker-Loud (Dec. 2016). "Strong isospin violation and chiral logarithms in the baryon spectrum". In: arXiv: 1612.07733 [hep-lat].

## Synergistic Activities

- Co-Pi for 2020 computing proposal: 2020-2021 ASCR Leadership Computing Challenge (ALCC).
- PI for research proposal at University of Costa Rica: "Strong interactions from Lattice QCD: hyperons axial and vector couplings"

## Conferences

### Talks

- Fundamental Interactions from Lattice QCD, Presentación, LANSPA, January 2020.
- "Short Range Operator Contributions to  $0\nu\beta\beta$  decay from LQCD", Progress and Challenges in Neutrinoless Double Beta Decay, Trento, Italia, July 19, 2019.
- "A percent-level determination of the nucleon axial coupling from Quantum Chromodynamics", The 15th International Conference on Meson-Nucleon Physics and the Structure of the Nucleon, Pittsburg, June, 2019.
- Short Range Operator Contributions to  $0\nu\beta\beta$  decay from LQCD, 36th International Symposium on Lattice Field Theory, July, 2018.

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- *“Calculating nuclear matrix elements for neutrinoless double beta decay using lattice QCD”*, Probing fundamental interactions by low energy excitations – Advances in theoretical nuclear physics, Sweden, June 2017.
- *“Determining the CP odd pion-nucleon coupling with spectroscopic lattice QCD calculations: Part II”*, APS Far West Meeting, Davis CA, Octubre 2016.