

Hugo Alberto Ayala Solares

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Pennsylvania State University

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<http://www.phys.psu.edu/people/hza53>

PROFESSIONAL SKILLS

Computational

Advance Knowledge: C/C++, Python (NumPy, SciPy, SciKit-learn, matplotlib, astropy, celery, twisted), ROOT, Linux, Ubuntu, LaTeX.

Intermediate Knowledge: Bash, MySQL, php, html

Research

Programming, Data Analysis, Statistics, Machine Learning, Git, Gamma-ray Astrophysics, High-energy Astrophysics

Languages

Spanish (Native), English (Fluent), German (Basic Knowledge)

PROFESSIONAL EXPERIENCE

Postdoctoral Scholar

2017-

Pennsylvania State University

- Member of the Institute for Gravitation and the Cosmos. Advisors: Miguel Mostafa and Doug Cowen: work on multimessenger astrophysics.
- Member of the High Altitude Water Cherenkov Observatory.
- Coordinator of the multimessenger and multiwavelength group in HAWC.
- Publications Committee member of HAWC.
- Member of the Astrophysical Multimessenger Observatory Network.
- Member of the IceCube neutrino observatory.
- Developed algorithms for coincidence analysis based on likelihood methods.
- Maintained and updated python software.

PhD Researcher

2011-2017

Michigan Technological University (MTU), Houghton, MI

- Create and maintain calibration of the HAWC detector.
- Developed algorithms to reconstruct astrophysical events from data.
- Developed an analysis to search for weak signal in high-level background.

Research Intern

Spring 2011

Photonics and Mathematical-Optics Group

- Studied equations for spiral profiles of light after passing through birefringent objects.

Research Intern

Summer 2010

Summer Intern at Michigan Technological University, Houghton, MI, USA

- Studied and analyzed the calibration system of the HAWC detector.

EDUCATION

PhD Physics 2011-2017
Michigan Technological University (MTU), Houghton, MI
“[Search for High-Energy Gamma Rays in the Northern Fermi Bubble Region with the HAWC Observatory](#)”
Thesis advisor: Petra Huentemeyer (University of Hamburg/DESY)

BS Engineering Physics 2006-2010
Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM), Monterrey, Mexico.
Advisor: Dr. Alfonso Serrano Heredia

Exchange Program at MTU 2009-2010
Michigan Technological University (MTU)
GPA: 3.89/4

TEACHING

- Spring 2016: **Instructor for Waves and Thermodynamics Lab MTU**
- Fall 2013: **Instructor for Astronomy Lab MTU**
- Spring 2013: **Instructor for Astronomy Lab MTU**
- Fall 2012: **Instructor for Electromagnetism Lab MTU**
- Spring 2012: **Instructor for Classical Mechanics Lab MTU**
- Fall 2011: **Instructor for Classical Mechanics Lab MTU**
- Fall 2010: **Teaching Assistant for Electromagnetic Theory Class ITESM**
- Spring 2009: **Instructor for Classical Mechanics Lab ITESM**
- Fall 2008: **Physics and Mathematics Advisor ITESM**
- Fall 2007: **Physics and Mathematics Advisor ITESM**

CONFERENCES

20. ICRC 2019, Madison, Wisconsin, 07/2019
19. IGC@25, State College, Pen, 06/2019
18. AMON Workshop, Chiba, Japan, 05/2019 **Invited**
17. APS, Denver, Colorado, 04/2019
16. Asterics, Groningen, The Netherlands, 03/2019 **Invited**
15. Non-thermal Universe, Cochem, Germany, 09/2018 **Invited**
14. VHEUP, Quy Nhon, Vietnam, 08/2018 **Invited**

13. APS, Columbus, Ohio, 04/2018
12. APS, Washington, D.C., 01/2017
11. Gamma16, Heidelberg, Germany, 07/2016
10. Fermi-VERITAS-HAWC Workshop, Salt Lake City, Utah, 04/2016
9. APS, Salt Lake City, Utah, 04/2016
8. Fermi Symposium, Washington, D.C., 11/2015
7. ICRC 2015, The Hague, Netherlands, 08/2015
6. APS, Baltimore, MD, 04/2015
5. Graduate Research Colloquium at MTU, Houghton, MI, 02/2015 Award best talk
4. Fermi-VERITAS-HAWC Workshop, Madison, WI, 10/14
3. Fermi-VERITAS-HAWC Workshop, Maryland, MD, 02/14
2. ICRC 2013, Rio de Janeiro, Brazil, 07/13 **Poster**
1. Fermi Summer School, Delaware, 05/13

AWARDS

- 2017 Henes Fellowship Assistant Award by Department of Physics at MTU
- 2016 Doctoral Finishing Fellowship Award by Graduate School at MTU
- 2016 Graduate Research Assistantship by Department of Physics at MTU
- 2012 Outstanding Teaching Assistant
- 2011-2015 Graduate Teaching Assistantship by Department of Physics at MTU
- 2010 Honorable Mention of Excellence by ITESM
- 2010 Dean's List 4.0 at MTU
- 2006-2010 Academic Excellence Scholarship by ITESM

SELECTED PUBLICATIONS

- *Journal Article* Ayala Solares, Hugo A., et al., "The Astrophysical Multimessenger Observatory Network", *Astro. Part.*, 114, 2020.
- *Conference Proceedings* Ayala Solares, Hugo A., for the HAWC collaboration, for the IceCube collaboration, for the AMON project, "AMON: TeV Gamma and Neutrino Coincidence Alerts from HAWC and IceCube subthreshold data", *PoS, ICRC 2019*.
- *Journal Article* The HAWC Collaboration, et al., Search for Very High-energy Gamma Rays from the Northern Fermi Bubble Region with HAWC, *ApJ*, 842, 2017.

- *PhD Thesis* Ayala Solares, Hugo Alberto, "Search for High-Energy Gamma Rays in the Northern Fermi Bubble Region with the HAWC Observatory", Open Access Dissertation, Michigan Technological University, 2017.