Manuel Pichardo Marcano

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Pronouns: he/him/his

Research Interests

Compact Objects; Compact Objects in Globular Clusters; White Dwarf Binaries; Cataclysmic Variables; AM CVns; Variable Stars, Binary systems, Data analysis, Big data.

Postdoctoral Research Experience

- *American Museum of Natural History, New York, NY*
  Kalbfleisch Postdoctoral Research Fellow
  September 2022 - Present

Education

- *PhD., Physics*
  Texas Tech University, 2018-2022
  Project: Variability of Accreting White Dwarf Binaries and Other Compact Objects
  Advisors: Professor Thomas J. Maccarone and Professor Liliana E. Rivera Sandoval
- *Master of Science in Physics*
  Texas Tech University, 2016-2018
- *Joint European Master Degree in Space Science & Technology*
  Project: MUSE observations of the compact objects NGC 6397
  M.S., Space and Science Technology, Luleå tekniska universitet (2014 - 2016)
  M.S., Astrophysics, Université Paul Sabatier Toulouse III, Mention Assez Bien (2014 - 2016)
  Advisors: Dr. Natalie Webb and Dr. Sebastien Guillot
- *Bachelor of Science, Physics*
  Utah State University, Cum Laude (2014)

Research Experience

- Spring 2016: *Research Project*, Research Institute in Astrophysics and Planetology (IRAP).
  MUSE observations of the compact objects NGC 6397. `https://github.com/manuelmarcano22/MasterThesis`
- Summer 2015: *Summer Project*, Institute for Gravitational Research, University of Glasgow.
  `https://github.com/manuelmarcano22/aLIGO-wxPython`
- 2013-2014: *Undergraduate Researcher*, Utah State University, Astrophysics Group.
  `http://arxiv.org/abs/1311.3153`
- Summer 2013: *Undergraduate Researcher*, National Center for Atmospheric Research
  `http://manuelpm.me/papers/posterhao.pdf`
- Summer 2012: *Undergraduate Researcher*, Stanford University, Geophysics Dep.
  `http://manuelpm.me/papers/posterinsar.pdf`

Publications

Papers

Refereed

- **Pichardo Marcano, M.**, Rivera Sandoval, L. E., Maccarone, T. J., Rohrmann, R. D., Heinke, C. O., Belloni, D., Althaus, L. G. & Bahramian, A. (accepted). A candidate magnetic helium core white dwarf in the globular cluster NGC 6397.arXiv:2303.04184
- **Pichardo Marcano, M.**, Rivera Sandoval, L. E., Maccarone, T. J., & Scaringi, S. (2021). TACOS: TESS AM CVn Outbursts Survey,Monthly Notices of the Royal Astronomical Society, 508, 3275.
- **Pichardo Marcano, M.**, Rivera Sandoval, L. E., Maccarone, T. J., Zhao, Y., & Heinke, C. O. (2021). A 2-d orbital period for a redback millisecond pulsar candidate in the globular cluster NGC 6397, Monthly Notices of the Royal Astronomical Society, 503, L51.
- Schwope, A., Buckley, D. A. H., Kawka, A., König, O., Lutovinov, A., Maitra, C., Mereminskiy, I., Miller-Jones, J., **Pichardo Marcano, M.**, Rau, A., Semena, A., Townsend, L. J., & Wilms, J. (2021). Identification of SRGt 062340.2-265715 as a bright, strongly variable, novalike cataclysmic variable, arXiv e-prints, arXiv:2106.14538.
- Rivera Sandoval, L. E., Maccarone, T. J., & **Pichardo Marcano, M.** (2020). A Year-long Superoutburst from an Ultra-compact White Dwarf Binary Reveals the Importance of Donor Star Irradiation, The Astrophysical Journal, 900, L37.
- Zhao, Y., Heinke, C. O., Tudor, V., Bahramian, A., Miller-Jones, J. C. A., Sivakoff, G. R., Strader, J., Chomiuk, L., Shishkovsky, L., Maccarone, T. J., **Pichardo Marcano, M.**, & Gelfand, J. D. (2020). The MAVERIC survey: a hidden pulsar and a black hole candidate in ATCA radio imaging of the globular cluster NGC 6397, Monthly Notices of the Royal Astronomical Society, 493, 6033.
- S.W. McIntosh, W.J. Cramer, **M. Pichardo Marcano**, R.J. Leamon. *The detection of Rossby-like waves on the Sun*. Nature Astron. 1, 0086 (2017). `doi:10.1038/s41550-017-0086`

Non-refereed

- Maccarone, T. J., Beardmore, A., Mukai, K., Page, K., **Pichardo Marcano, M.**, & Rivera Sandoval, L. (2021). X-ray Pulsations from Nova Her 2021,The Astronomer's Telegram, 14776, 1.
- **Pichardo Marcano, M.** (2020). A period of 3.9 hours in the TESS light curve of SRGt 062340.2-265715,The Astronomer's Telegram, 14222, 1.
- Jeffrey S. Hazboun, **Manuel Pichardo Marcano** and Shane L. Larson. *Limiting alternative theories of gravity using gravitational wave observations*
preprint `http://arxiv.org/abs/1311.3153`

Talks and Posters

- *A candidate magnetic helium core white dwarf binary in the globular cluster NGC 6397*
Talk. 241th AAS Meeting. 2023.
- *A search for variable stars and compact binaries in globular clusters with HST* (Invited)
Talk. Trinity University Physics Department Seminar. 2022
- *TACOS: TESS AM CVn Outbursts Survey*
Talk. AM CVn 4.5 Meeting. September 2022.
- *Variability of Accreting White Dwarf Binaries and Other Compact Objects*
Dissertation Talk. 240th AAS Meeting. 2022.

- *A search for variable stars and compact binaries in globular clusters with HST* (Invited)
  Talk. UTRGV Physics Department Colloquium. 2022
- *Results from the TESS AM CVn Outbursts Survey (TACOS)*
  Talk. TESS Science Team Meeting #26. 2021.
- *Astronomía en Ultravioleta.* (Invited)
  Talk. Alpha-Cen Summer School. 2021.
- *A Search for Variable Stars and Compact Binaries in Globular Clusters with HST*
  Talk. Alpha-Cen Annual Meeting and General Assembly. 2020
- *SSCOVaS: Survey for Studying Compact Objects and Variables Stars*
  Poster. 36th Annual New Mexico Symposium. 2020
- *"Compact Binaries in the globular cluster NGC 6397"*
  Talk. Texas APS Section. Lubbock, TX. 2019
- *"MUSE integral field unit observations of the compact objects in the globular cluster NGC 6397"*
  Poster. Stellar Remnants at the Junction. Junction, TX. 2016
- *"Measuring Water Level Fluctuations of Two Connected Wetlands in the Dominican Republic Using InSAR"*
  Poster. SHPE National Conference. Dallas, TX. 2012
- *"Measuring Water Level Fluctuations of Two Connected Wetlands in the Dominican Republic Using InSAR"*
  Talk. USU Physics Department Colloquium. 2012

Proposals

- Hubble Space Telescope (HST): Archival research grant proposal. *A search for variable stars and compact binaries in globular clusters with HST* (Co-Investigator)
- Transiting Exoplanet Survey Satellite (TESS): *"Studying the outbursts of AM CVns with TESS"* (Co-Investigator)
- Multi Unit Spectroscopic Explorer (MUSE): *The Hydrogen Alpha Disk Emission from the Compact Binaries of the Globular Cluster NGC 6397* (Co-Investigator 1.5 h)

Teaching and Mentoring Experience

Teaching

- Graduate Part-Time Instructor PHYS 1403/1404: Intructor of record for Algebra-based, Inquiry-based, Laboratory-based Introductory Physics. TTU, 2017.
- Teaching Assistant PHYS 1401/2401: Principles of Physics I/II. Lead the laboratories and discussions for the calculus based introductory physics. TTU, 2016-2017.
- Undergraduate Teaching Fellow PHYS 2215: Physics for Scientists and Engineers Lab I - Utah State, Fall 2013.

Mentoring

- Mentor for *The Science Research Mentoring Program (SRMP)* at the American Museum of Natural History. Mentored 3 high school students to conduct research in machine learning in astronomy. Sept 2022 - May 2023
- Mentor for *The Central American-Caribbean bridge in astrophysics (CENCA)*. CENCA is a remote research experience for undergraduates. Spring 2021, Fall 2022.

Recognition & Leadership Experiences

- Outstanding Ph.D. Student: *TTU Physics & Astronomy Department. 2022*
- FAMOUS (Funds for Astronomical Meetings: Outreach to Underrepresented Scientists) travel grant for the 239th meeting of the AAS.
- Co-organizer First ComSciCon en Español. The communicating science workshop for graduate students.
- Bucy Scholarship in Applied Physics: *TTU Physics & Astronomy Department. 2020-2021*
- Erasmus Mundus Scholarship: 2-year scholarship awarded by the European Commission
- Presidential Scholarship: Full 4-year scholarship awarded by the Dominican Government
- Member: *Sigma Pi Sigma*, The Physics Honor Society
- Lawrence R. and Abeline Megill Scholarship: *USU Physics Department*

Technical Skills

- *Programming Languages*: Proficient in Python (Jupyter/iPython notebooks) and shell scripting (bash).
- *Markup Languages*: LaTeX, Markdown
- *Operating Systems*: GNU/Linux, OS X, Windows
- *Software*: IRAF/PyRAF, DOLPHOT, SAOImageDS9/JS9
- *Version Control Systems*: Git
- *Virtualization and Cloud Services*: Docker (basic)

Languages

- *Spanish*: Native Language
- *English*: Fluent
- *French*: Intermediate knowledge (B1)

Professional Development

Workshops

- **Penn State Summer School in Statistics for Astronomers**: Lectures and tutorials in statistics, astronomy, computer science, and informatics. Summer, 2021
- **SciPy 2021:** Scientific Computing with Python conference. Summer, 2021
- **Wiki Scientist Course**: Elevating the Visibility of Quantum Scientists on Wikipedia by the American Physical Society and Wiki Education. Spring, 2021. Blog post: Improving the quality of Spanish language articles on Wikipedia
- **ComSciCon:** The communicating science workshop for graduate students. June, 2020.
- **Reclaiming STEM:** Diverse & inclusive SciComm workshop. Fall, 2020.
- **JWST proposal preparation workshop:** Instrument description, planning tools and hands-on sessions. Spring, 2020.
- **NRAO Community Days at TTU:** Two-day event, including hands-on sessions and observation preparation and data reduction. Spring, 2019.

Public Outreach

- *Past Author at Astrobitos*: One of the original authours.
  Astrobitos is the Spanish language version of Astrobites.
  URL: `https://astrobitos.org/author/manuelmarcano22/`

Talks

- *Binarias de Enanas Blancas: Sirenas de Ondas Gravitacionales y Laboratorios Estelares*.
  Talk. American Association of Variable Star Observers. 2022.
- *Caminando en la Luna*.
  Talk. Planetario de San Josè UCR. 2021.

Texas Tech

- *A needle in a Haystack: Finding Exotic Binaries in Star Clusters*.
  Astronight. YWCA Lubbock. 2022.
  `https://slides.com/mmarcano22/ywca2022`
- *Unveiling Hubble 30th Anniversary Banner*.
  Astronight. YWCA Lubbock. 2022.
  `https://hubblesite.org/hubble-30th-anniversary/events`
- *"Hubble's 30th Anniversary/30 aniversario del telescopio Hubble"*
  Won a competition to host one of the anniversary banners.
  Bilingual talk (Spanish/English) for Astronight event at TTU, Lubbock, TX. 2020
- *"A tour of the Milky Way/Un Tour por la Vía Lactea"*
  Bilingual talk for Astronight event at TTU, Lubbock, TX. 2019
- *"Dimensionality Reduction applied to Large Spectroscopic Surveys"*
  Emmy Noether High School Mathematics Day, Lubbock, TX. 2018

Dominican Society of Amateur Astronomers (Astrodom)

- *"Una aguja en un pajar: Buscando remanentes estelares en cumulos globulares"*
  Santo Domingo, Dominican Republic. 2020
- *"Galactic Bulge Survey: Fuentes de Rayos X del Bulbo Galactico"*
  Santo Domingo, Dominican Republic. 2018
- *"Estudio de la poblacion de objetos compactos en el cumulo globular NGC 6397 con la unidad de campo integral MUSE"*
  Santo Domingo, Dominican Republic. 2016

References

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The University of Texas Rio Grande Valley
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