Andrés Cuéllar Vega

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Physicist interested in theoretical and computational modeling of quantum systems and applications to quantum information science.
Proficient in mathematical modeling and scientific data analysis, as well as computational languages and tools including Python, Matlab, & Mathematica.
I enjoy the process of learning and understanding complex physical processes.
I'm capable of working independently but thrive in collaborative environments.

EDUCATION

Master of Science in Physics   Dec, 2021
University of Texas Rio Grande Valley   GPA: 3.46/4.0
Thesis: 'Dynamical Casimir Effect in a Superconducting Circuit Periodic Lattice'

Bachelor of Science in Physics   May, 2019
University of Texas Rio Grande Valley   GPA: 3.15/4.0

RESEARCH EXPERIENCE

Graduate Research Assistant   Jan, 2019. - Dec, 2021
Department of Physics & Astronomy, UTRGV.
Supervised by Andreas Hanke.

- Developed a theoretical and computational model to study the dynamical Casimir effect in a newly proposed superconducting circuit architecture.
- Characterized the non-classical light radiation output of a tunable lattice structure composed of superconducting quantum interference devices (SQUID) embedded in a coplanar waveguide. Publication in process.

Undergraduate Research Assistant   2012 -2016
UTRGV Center for Advanced Radio Astronomy.
Supervised by Fredrick Jenet and Joseph Romano.

- Performed frequent observations through using the Arecibo Radio Telescope, as well as the Green Bank Radio Telescope and the Long Wavelength Array. Reviewed thousands of radio signal profiles and identified their likelihood to be neutron stars. Responsible for the discovery of a radio pulsar (J0640-00) as part of AO 327MHz Drift Survey.
- Performed in-situ pulsar timing observations of double neutron star system at the Arecibo Radio Telescope in Puerto Rico. 2013.
- Acted as team leader, supervising undergraduate and graduate students in the center. 2015-2016
- Performed early testing of radio antennas phased array design. Supervised by Richard Price. Developed program to search for X-Ray Binaries in data from NASA's Swift telescope. Supervised by M. Benacquista.

Summer Research Intern   May 2014 - Aug. 2014
Max Planck Institute for Gravitational Physics (Albert Einstein Institute).
Supervised by Holger Pletsch, and Colin J. Clark.

- Developed a data analysis pipeline to implement gamma ray pulsar blind search method developed by collaborators.
- Pipeline made use of the HTCondor parallel computing software with the Atlas Computing Cluster ($\sim$40,000 CPUs) to perform automated daily processing of data from the Fermi Large Area Telescope, uploading suitable pulsar candidates to follow up website.

TEACHING
EXPERIENCE

Graduate Teaching Assistant   Aug, 2019 - Dec 2021
Department of Physics & Astronomy
Responsibilities included course planning, and teaching online laboratory sections, as well as grading and holding recitation sessions. Courses taught:
General Physics I & II laboratories. Intro to Astronomy I laboratory. Physics for Scientists & Engineers (grader & recitation instructor).

COMPUTATIONAL
SKILLS

Computational experience: Physical system modeling, data analysis and data visualization.
Primary programming language: Python.
Proficient in scientific libraries such as Numpy, Sympy, and Matplotlib.
Other programming experience: Matlab, Mathematica, Julia, Bash.
Operating systems: Linux, Mac OS, Microsoft.
Others: Jupyter, Github, HTCondor, LaTeX.

SELECTED
PUBLICATIONS

Einstein@Home discovers a radio-quiet gamma-ray millisecond pulsar
C. J. Clark et al. Science Advances, 4, eaao7228 (2018)
The Einstein@Home Gamma-ray Pulsar Survey. I. Search Methods, Sensitivity and Discovery of New Young Gamma-ray Pulsars.
CJ Clark, J Wu, HJ Pletsch, Lucas Guillemot, B Allen, C Aulbert, C Beer, O Bock, **A Cuéllar**, HB Eggenstein, H Fehrmann, M Kramer, B Machenschalk, L Nieder. The Astrophysical Journal 834 106 (2017)
The Braking Index of a Radio-quiet Gamma-ray Pulsar
CJ Clark, HJ Pletsch, J Wu, Lucas Guillemot, F Camilo, TJ Johnson, M Kerr, B Allen, C Aulbert, C Beer, O Bock, **A Cuéllar**, HB Eggenstein, H Fehrmann, M Kramer, B Machenschalk, L Nieder. The Astrophysical Journal Letters 832 L15 (2016)
PSR J1906+0722: An Elusive Gamma-ray Pulsar
C. J. Clark et al. The Astrophysical Journal Letters 809 L2 (2015)

SELECTED PRESENTATIONS	*Dynamical Casimir Effect in a Superconducting Circuit Periodic Lattice*
	UTRGV College of Science Annual Research Conference　　　　Nov, 2021
	Dynamical Casimir Effect in a Superconducting Circuit Periodic Lattice
	Colloquium, UTRGV Department of Physics & Astronomy　　　Nov, 2020
	Quantum: The Next Step In Computing
	Public Outreach Talk.　　　　　　　　　　　　　　　　June 8, 2015.
	Monday Night Science Cafe, UTRGV Department of Physics & Astronomy.
	Looking for Periodicity in X-Ray Emission Data.
	Poster Presentation.　　　　　　　　　　　　　　　　　Jan 6, 2014.
	A. Cuellar, S. Cohen, and M. Benacquista.
	American Astronomical Society, AAS Meeting 223, id.155.41 Washington, DC.

COMMUNICATION & OUTREACH EXPERIENCE	*Guest* in 'The Millennial Scientist Podcast'. Mexican Science communication podcast. Discussed work on Black holes that led to the 2020 Nobel Price in Physics. (2020)
	Event planning committee. German Language and Culture Club at UTRGV (2018-2019).
	Main organizer. "Monday Night Science Cafe". Monthly event hosted by the Department of Physics and Astronomy at UTRGV (2015-2016).
	Secretary. Society of Physics Students
	University of Texas at Brownsville (2012-2014).

AWARDS	**Presidential Graduate Research Assistantship**　　　　　　2019
	Graduate research assistantship program covering tuition and stipend from the Graduate College at UTRGV.
	Arecibo Remote Command Center Scholarship　　　　2013-2015.
	Undergraduate research assistantship program covering tuition and stipend from the Center for Advanced Radio Astronomy at UTRGV.
	International Student Talent Scholarship　　　April 2014, Oct.2014.
	Awarded by the Office of Global Engagement at the University of Texas at Brownsville.
	German Academic Exchange Service RISE Scholarship　　May 2014.
	Scholarship awarded by the Research Internships in Science and Engineering (RISE) scholarship program.

NON-PROFESSIONAL INTERESTS	Music Composition and Performance.
	Language Learning and Exchange.
	Bicycle touring. Literature. Philosophy.