

Jesus Rivera

Swarthmore College
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POSTIONS

Swarthmore College, August 2019-present

Visiting Assistant Professor of Astronomy, Department of Physics and Astronomy
Consortium for Faculty Diversity Fellow

EDUCATION

Rutgers, the State University of New Jersey, Fall 2012–Summer 2019

Ph.D., Department of Physics and Astronomy

Advisor: Professor Andrew J. Baker

Honors and Awards:

- 2013-2014: Richard J. Plano Outstanding TA Award
- 2012-2013: New Jersey Space Grant Consortium Fellowship

The University of Texas at Brownsville (UTB), Fall 2008–Spring 2012

Bachelor of Science, Department of Physics and Astronomy

Advisor: Professor Fredrick A. Jenet

Thesis: “Power Distribution in the LoFASM Radio Telescope Array”

Honors and Awards:

- 2008-2012: Arecibo Remote Command Center Scholarship (a competitive, full-ride physics scholarship), Fall 2008-Spring 2012
- 2011: College of Science, Mathematics, and Technology (CSMT) Scholarship (spring)
- 2008: Hispanic Scholarship Fund, The Peierls Foundation, Inc. Shooting Star Scholarship (fall)

TEACHING

Swarthmore College

- Fall 2019: ASTR 016, “Stars, ISM, and Galaxies” (co-teaching with Prof. David Cohen); ASTR 001, “Introduction to Astronomy (one lab section)”

Rutgers, the State University of New Jersey

- 2018: Facilitator, Developing Educational Leaders among TAs in Physics (DELTA-P) graduate student seminar (fall)
- 2015–2016: Laboratory instructor, Observational Radio Astronomy 343 (spring; 4 sections)
- 2014–2015: Recitation Instructor for Extended General Physics 201 (spring; 4 sections)
- 2013–2014: Laboratory instructor, Observational Radio Astronomy 343 (spring; 6 sections); Recitation instructor, Extended Analytical Physics 115 (fall; 4 sections)

The University of Texas at Brownsville (UTB)

- 2010: Noyce Summer Institute, a program geared at helping science majors effectively teach science concepts at the K-12 level (summer)

- 2009 & 2010: Summer research mentor, Astronomy Ambassadors high school program (summer)
- 2009–2010: Recitation Instructor for University Physics I and II (volunteer)
- 2009: Summer instructor, pre-calculus boot camp (summer)

RESEARCH

Swarthmore College

Research

Study galaxy formation and evolution by analyzing multi-wavelength observations of a sample of high-redshift, dusty star-forming galaxies (DSFGs) first identified in a Atacama Cosmology Telescope (ACT) wide-field survey.

Rutgers, the State University of New Jersey

Research

Investigated high-redshift DSFGs from the ACT survey using multi-wavelength observations to expand our knowledge of galaxy formation and star formation in the universe:

- analyzed Submillimeter Array (SMA) continuum data for eight DSFGs with the MIR software package, to determine accurate positions
- analyzed NOthern Extended Millimeter Array (NOEMA) CO observations of six DSFGs using the GILDAS software, to support gravitational lens modelling
- analyzed Very Large Array (VLA) continuum data for 34 DSFGs using the CASA software package, to determine accurate positions and photometric redshifts
- analyzed Combined Array for Research in Millimeter-wave Astronomy (CARMA) CO observations of two DSFGs for redshift confirmation and molecular mass estimation
- analyzed near-infrared integral field data from the Very Large Telescope (VLT) for a strongly lensed DSFG using the *Gasgano* software

Workshops

- Jan 2017: Astronomy Ambassadors program, American Astronomical Society 229th Meeting
- May 2014: 14th Synthesis Imaging Workshop National Radio Astronomical Observatory (NRAO)
- August 2013: CARMA Summer School

Observations

- August 2017: conducted submillimeter observations: SMA
- March 2016: conducted CO spectral observations: GBT
- January 2015: conducted millimeter/submillimeter observations: Large Millimeter Telescope (LMT)
- August 2013: conducted millimeter spectral observations: CARMA

The University of Texas at Brownsville

Research (selected)

- helped develop the back-end for the Low Frequency All Sky Monitor, a telescope array built at UTB
- searched through data taken with the Arecibo Radio Observatory and Green Bank Telescope (GBT) for pulsars that could be used for timing

- built a Very Small Radio Telescope (based on the design from MIT Haystack Observatory) from “off-the-shelf” materials and used it as an outreach tool for tours given at the university

Observations

- Fall 2008 - May 2012: conducted radio observations: Arecibo Radio Telescope (80+ hours), GBT

The University of Oklahoma

- Summer 2011: Research Experience for Undergraduates (REU), worked with Professor Eric Abraham on the cooling and trapping of ultra-cold Rubidium atoms

PUBLICATIONS

- “The Atacama Cosmology Telescope: CO(J = 3 - 2) mapping and lens modeling of an ACT-selected dusty star-forming galaxy” **Rivera, J.**, Baker, A.J., Gallardo P. A., Gralla, M., Harris A. I., Haffenberger, K. M., Hughes J. P., Keeton C. R., Lopez-Caraballo, C. H., Marriage, T. A., Partridge, B., Sievers, J., Tagore, A. S., Walter, F., Weiß, A., Wollack, E. J., 2019, ApJ, 879, 95
- “Resolved Molecular Gas and Star Formation Properties of the Strongly Lensed Galaxy SDSS J0901+1814,” Sharon, C. E., Tagore, A. S., Baker, A. J., **Rivera, J.**, Keeton, C. R. II, Tacconi, L. J., Lutz, D., Wilner, D. J., Shapley, A. E., Lin, H., Diehl, H. T., Allam, S. S., Tucker, D. L. 2019, ApJ, 879, 52
- “Multiwavelength Characterization of an ACT-selected, Lensed Dusty Star-forming Galaxy at $z = 2.64$,” Roberts-Borsani, G. W., Jiménez-Donaire, M. J., Daprà, M., Alatalo, K., Aretxaga, I., Álvarez-Márquez, J., Baker, A. J., Fujimoto, S., Gallardo, P. A., Gralla, M., Hilton, M., Hughes, J. P., Jimnez, C., Laporte, N., Marriage, T. A., Nati, F., **Rivera, J.**, Sievers, A., Weiß, A., Wilson, G. W., Wollack, E. J., & Yun, M. S., 2017, ApJ, 844, 110
- “On the redshift distribution and physical properties of ACT-selected DSFGs,” Su, T., Marriage, T. A., Asboth, V., Baker, A. J., Bond, J. R., Crichton, D., Devlin, M. J., Dünner, R., Farrah, D., Frayer, D. T., Gralla, M. B., Hall, K., Halpern, M., Harris, A. I., Hilton, M., Hincks, A. D., Hughes, J. P., Niemack, M. D., Page, L. A., Partridge, B., **Rivera, J.**, Scott, D., Sievers, J. L., Thornton, R. J., Viero, M. P., Wang, L., Wollack, E. J., Zemcov, M., 2017, MNRAS 464, 968
- “Apparent Faster-Than-Light Pulse Propagation in Interstellar Space: A new probe of the Interstellar Medium,” Jenet, F. A., Fleckenstein, D., Ford, A. J., Garcia, A., Miller, R., **Rivera, J.**, Stovall, K., 2010, ApJ, 710, 1728

PRESENTATIONS

Talks

- 01/2019 AAS 233rd Meeting, Thesis talk, “Detailed studies of ACT gravitationally lensed dusty star-forming galaxies using NOEMA CO mapping and HST imaging”
- 01/2018 ACT f2f Meeting, Princeton, “ACT DSFG Follow-up”
- 10/2017 Rutgers University, Astronomy group research talk
- 01/2017 AAS 229th Meeting, “GBT CO Observations of two ACT dusty star-forming galaxies”
- 10/2016 SACNAS Conference, “The Detailed Properties of Dusty Star-Forming Galaxies in the Distant Universe”
- 09/2016 Rutgers University, Astronomy group research talk

- 02/2017 ACT Gimlet-Eyed Meeting Fireslide, Princeton, “GBT CO(1-0) observations of two ACT DSFGs”
- 03/2015 Rutgers University, Astronomy group research talk, Rutgers University
- 04/2015 Rutgers University, Graduate student seminars (SSPAR)
- 04/2014 Rutgers University, Astronomy groups research talk
- 06/2012 UTB, Invited Talk, “SINFONI VLT Observations on J0901”
- 05/2012 UTB, Undergraduate Thesis Talk, “Power Distribution in the LoFASM Radio Telescope Array”
- 07/2011 University of Oklahoma, REU Presentation
- 2008-2012 ARCC research presentation, UTB, semester basis

Conference Posters (selected)

- “The Low Frequency All Sky Monitor for the Study of Radio Transients: Prototype Hardware Development,” **Rivera, J.**, Ford, A. J., Jenet, F. A., Stovall, K., Cohen, S. C., Dartez, L., Garcia, A., Jr., Hinojosa, J., Longoria, C., Lunsford, G., Mata, A., Miller, R. B., Reser, J. S., Hicks, B. C., Kassim, N. E., Ray, P. S., Taylor, G. B., 2012, 219th American Astronomical Society Meeting, 422.35
- “The Little App that Could,” **Rivera, J.**, Dartez, L., Ceballos, F., Garcia, A., Ford, A., Stovall, K., Wren, C., Jenet, F. A., PALFA Consortium, 2010, 215th American Astronomical Society Meeting, 453.07

**PROFESS-
IONAL/
COMMUNITY
SERVICE**

Professional Service

- 2018: Co-organizer for the STEM Community Outreach Symposium at Rutgers (STEMcos(R); stemcos.rutgers.edu), a grad student organized symposium for local high school and community college students to learn about the research conducted at Rutgers
- May 2017: Blog entry for the 2017 AAS CVD; “Important Lessons from Congressional Visits Day,” voluntarily written for 2017 AAS CVD workshop (<https://aas.org/posts/blog/2017/05/important-lessons-congressional-visits-day>)
- April 2017: Congressional Visits Day sponsored by the American Astronomical Society
- March 2016: Served on the Rutgers Southern African Large Telescope (SALT) Time Allocation Committee (TAC)
- 2014–2015: Elected Treasurer, Graduate Student Association for the Department of Physics and Astronomy
- Spring 2015: Served on the Local Organizing Committee for the “2015 PHISCC Workshop: HI Surveys Get Real” (Rutgers University)

Outreach/Community Service

- June 2017-2019: Conducted physics demos at Camden Street Elementary School
- 2016-2017: Graduate student panel for Aresty undergraduate summer program
- 2016-2017: Graduate student panel for McNair program
- July 2015: Talk at UTB for the Astronomy Ambassadors high school program, “Dusty Star-Forming Galaxies”
- March 2014: Rutgers Astronomical Society (RAS) Public Talk (Society of Physics hosted), Rutgers, “Pulsar timing and gravitational waves”

- 2011–2012: Member of the Physics Circus at UTB. Conducted physics demos at various K-12 schools and showed and explained the concepts behind them.
- Spring of 2009 & 2010: served as Rio Grande Valley Science and Engineering Fair Judge.
- Gave various tours around the astronomy lab throughout my tenure at UTB to K-12 students and explained our research.
- Traveled to various high schools around the Brownsville, TX area and presented our research to encourage students to apply to the physics program at UTB.