

# Daniel C. Jacobs

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## RESEARCH THEMES

Cosmological scale astrophysics with a particular focus on the epoch of reionization and cosmic dawn.  
Low frequency radio astronomy and instrumentation.  
Space-based instrumentation with a particular focus on cubesats  
Involvement of students in hands-on development of space instrumentation.

## POSITIONS

**Arizona State University**, School of Earth and Space Exploration  
▪ Assistant Professor Oct 2017 – Present  
▪ National Science Foundation Astronomy and Astrophysics Research Fellow 2014 – 2017  
▪ Postdoc 2011 – 2014

**University of Pennsylvania**, Dept. of Physics and Astronomy  
▪ Research Assistant 2009 – 2011

**Montana State University**, Space Science and Engineering Lab.  
▪ Project Manager 2005 – 2008

**Montana State University**, Physics Dept.  
▪ Research Assistant 2005 – 2008

**New Mexico Tech**, Physics Dept. Magdalena Ridge Observatory  
▪ Research Assistant 2002 – 2004

## EDUCATION

**Doctor of Philosophy (Ph.D.)** in Physics and Astronomy Sep 2011  
▪ University of Pennsylvania, Philadelphia, Pennsylvania, USA  
• Thesis: The Epoch of Reionization: Foregrounds and Calibration with PAPER  
• Adviser: Prof. James Aguirre

**Master of Science (M.Sc.)** in Physics Dec 2008  
▪ Montana State University, Bozeman, MT, USA

**Bachelor of Science (B.S.)** in Physics and Astrophysics May 2004  
▪ New Mexico Tech, Socorro, New Mexico, USA

## PRINCIPLE INVESTIGATOR

**Funding by the National Science Foundation**

*Collaborative Research: From 21 cm Observations to Precision Reionization Science* 2016 – 2019  
Astronomy and Astrophysics Research Grants (AAG), AST-1613973, \$240,228

*Observing the Epoch of Reionization with the Murchison Widefield Array* 2014 – 2017  
Astronomy and Astrophysics Research Grants (AAG), AST-1410719, \$201,366 \*

*An External Calibrator for Hydrogen Observatories* 2014 – 2016  
Advanced Technologies and Instrumentation (ATI) AST-1407646, \$99,287 \*

*Charting the history of reionization with the first 21cm observations* 2014 – 2017  
Astronomy and Astrophysics Postdoctoral Fellowship (AAPF), AST-1401708, \$258,000

**Funding by Industry**

*Scaling up 21cm analysis pipelines for the Square Kilometer Array* 2015–  
Amazon Web Services/SKA Partnership, \$10,000

\*Due to internal NSF rules, on these grants, though I act as PI in all respects, the NSF lists me as Co-PI, with Judd Bowman as the official PI. This is not the case with the most recent AAG.

<b>PROJECTS</b>	<b>Hydrogen Epoch of Reionization Array,</b> <a href="https://reionization.org">https://reionization.org</a>	2013 (inception) – Present
	<b>Precision Array for Probing the Epoch of Reionization,</b> <a href="http://eor.berkeley.edu">http://eor.berkeley.edu</a>	2009 – Present
	<b>Murchison Widefield Array</b> <a href="http://mwatelescope.org">http://mwatelescope.org</a>	2011 – Present
	<b>Star Planet Activity Research Cubesat</b>	2017 – Present

**PUBLICATIONS**      **PEER REVIEWED ARTICLES**

- [37] Neben, A. R., Bradley, R. F., Hewitt, J. N., DeBoer, D. R., Parsons, A. R., Aguirre, J. E., Jacobs, D., et al. *The Hydrogen Epoch Of Reionization Array Dish. I. Beam Pattern Measurements And Science Implications* , 826, 199, 2016
- [36] Jacobs, D. C., Hazelton, B. J., Trott, C. M., Dillon, J. S., Pindor, B., Sullivan, I. S. et al. *The Murchison Widefield Array 21 Cm Power Spectrum Analysis Methodology* , 825, 114, 2016
- [35] Ewall-Wice, A., Dillon, Joshua S., Hewitt, JN., Loeb, A., Mesinger, A., Neben, AR., Jacobs, D., et al. *First Limits On The 21 Cm Power Spectrum During The Epoch Of X-Ray Heating*. Monthly Notices of the Royal Astronomical Society, , stw1022, 2016
- [34] Giroletti, M., Massaro, F., D’Abrusco, R., Lico, R., Burlon, D., Hurley-Walker, N., Jacobs, D., et al. *High-Energy Sources At Low Radio Frequency: The Murchison Widefield Array View Of Fermi Blazars* Astronomy & Astrophysics, 588, A141, 2016
- [33] Offringa, AR., Trott, CM., Hurley-Walker, N., Johnston-Hollitt, M., McKinley, B., Barry, N., Jacobs, D., et al. *Parametrizing Epoch Of Reionization Foregrounds: A Deep Survey Of Low-Frequency Point-Source Spectra With The Murchison Widefield Array* Monthly Notices of the Royal Astronomical Society, 458, 1057–1070, 2016
- [32] Kohn, SA., Aguirre, JE., Nunhokee, CD., Bernardi, G., Pober, JC., Ali, ZS., Jacobs, D., et al. *Constraining Polarized Foregrounds For Eor Experiments. I. 2D Power Spectra From The Paper-32 Imaging Array* The Astrophysical Journal, 823, 88, 2016
- [31] Pober, JC., Hazelton, BJ., Beardsley, AP., Barry, NA., Martinot, ZE., Sullivan, IS., Jacobs, D., et al. *The Importance Of Wide-Field Foreground Removal For 21 Cm Cosmology: A Demonstration With Early Mwa Epoch Of Reionization Observations* The Astrophysical Journal, 819, 8, 2016
- [30] Trott, Cathryn M., Pindor, Bart, Procopio, Pietro, Wayth, Randall B., Mitchell, Daniel A., McKinley, Benjamin, Jacobs, D., et al. *Chips: The Cosmological H I Power Spectrum Estimator* The Astrophysical Journal, 818, 139, 2016
- [29] Carroll, PA., Line, J., Morales, MF., Barry, N., Beardsley, AP., Hazelton, BJ., Jacobs, D., et al. *A High Reliability Survey Of Discrete Epoch Of Reionization Foreground Sources In The Mwa Eor0 Field* Monthly Notices of the Royal Astronomical Society, 461, 4151–4175, 2016
- [28] Ali, Zaki S., Parsons, Aaron R., Zheng, Haoxuan, Pober, Jonathan C., Liu, Adrian, Aguirre, James E., Jacobs, D., et al. *Paper-64 Constraints On Reionization: The 21 Cm Power Spectrum At Z= 8.4* The Astrophysical Journal, 809, 61, 2015
- [27] McKinley, B., Yang, Ruizhi, López-Caniego, M., Briggs, F., Hurley-Walker, N., Wayth, RB., Jacobs, D., et al. *Modelling Of The Spectral Energy Distribution Of Fornax A: Leptonic And Hadronic Production Of High-Energy Emission From The Radio Lobes* Monthly Notices of the Royal Astronomical Society, 446, 3478–3491, 2015
- [26] Dillon, Joshua S., Neben, Abraham R., Hewitt, Jacqueline N., Tegmark, Max, Barry, N., Beardsley, AP., Jacobs, D., et al. *Empirical Covariance Modeling For 21 Cm Power Spectrum Estimation: A Method Demonstration And New Limits From Early Murchison Widefield Array 128-Tile Data* Physical Review D, 91, 123011, 2015
- [25] Callingham, JR., Gaensler, BM., Ekers, RD., Tingay, SJ., Wayth, RB., Morgan, J., Jacobs, D., et al. *Broadband Spectral Modeling Of The Extreme Gigahertz-Peaked Spectrum Radio Source Pks B0008-421* The Astrophysical Journal, 809, 168, 2015

- [24] Arora, BS., Morgan, John, Ord, SM., Tingay, SJ., Hurley-Walker, Natasha, Bell, M., Jacobs, D., et al. *Ionospheric Modelling Using Gps To Calibrate The Mwa. I: Comparison Of First Order Ionospheric Effects Between Gps Models And Mwa Observations* Publications of the Astronomical Society of Australia, 32, e029, 2015
- [23] Thyagarajan, Nithyanandan, Jacobs, Daniel C., Bowman, Judd D., Barry, N., Beardsley, AP., Bernardi, G. et al. *Confirmation Of Wide-Field Signatures In Redshifted 21 Cm Power Spectra* The Astrophysical Journal Letters, 807, L28, 2015
- [22] Pober, Jonathan C., Ali, Zaki S., Parsons, Aaron R., McQuinn, Matthew, Aguirre, James E., Bernardi, Gianni, Jacobs, D., et al. *Paper-64 Constraints On Reionization. Ii. The Temperature Of The  $Z= 8.4$  Intergalactic Medium* The Astrophysical Journal, 809, 62, 2015
- [21] Thyagarajan, Nithyanandan, Jacobs, Daniel C., Bowman, Judd D., Barry, N., Beardsley, AP., Bernardi, G. et al. *Foregrounds In Wide-Field Redshifted 21 Cm Power Spectra* The Astrophysical Journal, 804, 14, 2015
- [20] Ord, SM., Crosse, Brian, Emrich, David, Pallot, Dave, Wayth, RB., Clark, MA., Jacobs, D., et al. *The Murchison Widefield Array Correlator* Publications of the Astronomical Society of Australia, 32, e006, 2015
- [19] Offringa, AR., Wayth, RB., Hurley-Walker, N., Kaplan, DL., Barry, N., Beardsley, AP., Jacobs, D., et al. *The Low-Frequency Environment Of The Murchison Widefield Array: Radio-Frequency Interference Analysis And Mitigation* Publications of the Astronomical Society of Australia, 32, e008, 2015
- [18] Jacobs, Daniel C., Pober, Jonathan C., Parsons, Aaron R., Aguirre, James E., Ali, Zaki S., Bowman, Judd et al. *Multiredshift Limits On The 21 Cm Power Spectrum From Paper* The Astrophysical Journal, 801, 51, 2015
- [17] Hurley-Walker, Natasha, Morgan, John, Wayth, Randall B., Hancock, Paul J., Bell, Martin E., Bernardi, Gianni, Jacobs, D., et al. *The Murchison Widefield Array Commissioning Survey: A Low-Frequency Catalogue Of 14 110 Compact Radio Sources Over 6 100 Square Degrees* Publications of the Astronomical Society of Australia, 31, e045, 2014
- [16] Hindson, L., Johnston-Hollitt, M., Hurley-Walker, Natasha, Buckley, K., Morgan, John, Carretti, Ettore, Jacobs, D., et al. *The First Murchison Widefield Array Low-Frequency Radio Observations Of Cluster Scale Non-Thermal Emission: The Case Of Abell 3667* Monthly Notices of the Royal Astronomical Society, 445, 330–346, 2014
- [15] Offringa, AR., McKinley, Benjamin, Hurley-Walker, Natasha, Briggs, FH., Wayth, RB., Kaplan, DL., Jacobs, D., et al. *Wsclean: An Implementation Of A Fast, Generic Wide-Field Imager For Radio Astronomy* Monthly Notices of the Royal Astronomical Society, 444, 606–619, 2014
- [14] Parsons, Aaron R., Liu, Adrian, Aguirre, James E., Ali, Zaki S., Bradley, Richard F., Carilli, Chris L., Jacobs, D., et al. *New Limits On 21 Cm Epoch Of Reionization From Paper-32 Consistent With An X-Ray Heated Intergalactic Medium At  $Z= 7.7$*  The Astrophysical Journal, 788, 106, 2014
- [13] Pober, Jonathan C., Liu, Adrian, Dillon, Joshua S., Aguirre, James E., Bowman, Judd D., Bradley, Richard F., Jacobs, D., et al. *What Next-Generation 21 Cm Power Spectrum Measurements Can Teach Us About The Epoch Of Reionization* The Astrophysical Journal, 782, 66, 2014
- [12] Stefan, Irina I., Carilli, Chris L., Green, David A., Ali, Zaki, Aguirre, James E., Bradley, Richard F., Jacobs, D., et al. *Imaging On Paper: Centaurus A At 148 Mhz* Monthly Notices of the Royal Astronomical Society, , stt548, 2013
- [11] Pober, Jonathan C., Parsons, Aaron R., Aguirre, James E., Ali, Zaki, Bradley, Richard F., Carilli, Chris L., Jacobs, D., et al. *Opening The 21 Cm Epoch Of Reionization Window: Measurements Of Foreground Isolation With Paper* The Astrophysical Journal Letters, 768, L36, 2013
- [10] Tingay, SJ., Kaplan, DL., McKinley, Benjamin, Briggs, Franklin, Wayth, RB., Hurley-Walker, N., Jacobs, D., et al. *On The Detection And Tracking Of Space Debris Using The Murchison Widefield Array. I. Simulations And Test Observations Demonstrate Feasibility* The Astronomical Journal, 146, 103, 2013
- [9] Jacobs, Daniel C., Parsons, Aaron R., Aguirre, James E., Ali, Zaki, Bowman, Judd, Bradley, Richard F. et al. *A Flux Scale For Southern Hemisphere 21 Cm Epoch Of Reionization Experiments* The Astrophysical Journal, 776, 108, 2013

- [8] Moore, David F., Aguirre, James E., Parsons, Aaron R., Jacobs, Daniel C., Pober, Jonathan C. *The Effects Of Polarized Foregrounds On 21 Cm Epoch Of Reionization Power Spectrum Measurements* The Astrophysical Journal, 769, 154, 2013
- [7] Jacobs, Daniel C., Bowman, Judd, Aguirre, James E. *The Precision And Accuracy Of Early Epoch Of Reionization Foreground Models: Comparing Mwa And Paper 32-Antenna Source Catalogs* The Astrophysical Journal, 769, 5, 2013
- [6] Parsons, Aaron R., Pober, Jonathan C., Aguirre, James E., Carilli, Christopher L., Jacobs, Daniel C., Moore, David F. et al. *A Per-Baseline, Delay-Spectrum Technique For Accessing The 21 Cm Cosmic Reionization Signature* The Astrophysical Journal, 756, 165, 2012
- [5] Pober, Jonathan C., Parsons, Aaron R., Jacobs, Daniel C., Aguirre, James E., Bradley, Richard F., Carilli, Chris L. et al. *A Technique For Primary Beam Calibration Of Drift-Scanning, Wide-Field Antenna Elements* The Astronomical Journal, 143, 53, 2012
- [4] Parsons, Aaron, Pober, Jonathan, McQuinn, Matthew, Jacobs, Daniel, Aguirre, James A *Sensitivity And Array-Configuration Study For Measuring The Power Spectrum Of 21 Cm Emission From Reionization* The Astrophysical Journal, 753, 81, 2012
- [3] Jacobs, Daniel C., Aguirre, James E., Parsons, Aaron R., Pober, Jonathan C., Bradley, Richard F., Carilli, Chris L. et al. *New 145 Mhz Source Measurements By Paper In The Southern Sky* The Astrophysical Journal Letters, 734, L34, 2011
- [2] Plowman, Joseph E., Jacobs, Daniel C., Hellings, Ronald W., Larson, Shane L., Tsuruta, Sachiko *Constraining The Black Hole Mass Spectrum With Gravitational Wave Observations–I. The Error Kernel* Monthly Notices of the Royal Astronomical Society, 401, 2706–2714, 2010
- [1] Parsons, Aaron R., Backer, Donald C., Foster, Griffin S., Wright, Melvyn CH., Bradley, Richard E., Gugliucci, Nicole E., Jacobs, D., et al. *The Precision Array For Probing The Epoch Of Re-Ionization: Eight Station Results* The Astronomical Journal, 139, 1468, 2010

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- [3] Jacobs, D. C., Burba, J., Bowman, J., Neben, A. R., Stinnett, B., Turner, L. et al. *The External Calibrator For Hydrogen Observatories* ArXiv e-print arXiv:1610.02607, , , 2016
- [2] Lenc, Emil, Gaensler, BM., Sun, XH., Sadler, EM., Willis, AG., Barry, N., Jacobs, D., et al. *Low Frequency Observations Of Linearly Polarized Structures In The Interstellar Medium Near The South Galactic Pole* arXiv preprint arXiv:1607.05779, , , 2016
- [1] Moore, David, Aguirre, James E., Kohn, Saul, Parsons, Aaron, Ali, Zaki, Bradley, Richard, Jacobs, D., et al. *New Limits On Polarized Power Spectra At 126 And 164 Mhz: Relevance To Epoch Of Reionization Measurements* arXiv preprint arXiv:1502.05072, , , 2015

<b>PROFESSIONAL AFFILIATIONS &amp; ACTIVITIES</b>	<b>American Physical Society</b> , Maryland, USA	2002 – Present
	<b>Sigma Pi Sigma</b> , Maryland, USA	2004 – Present
	<b>American Astronomical Society</b> , Washington D.C., USA	2009 – Present
<b>TEACHING &amp; MENTORING</b>	<b>Exploration Systems Engineering (SES405)</b>	2018
	<b>Cubesat Lab Seminar</b>	2017
	<b>Capstone Customer &amp; Mentor</b> ASU School of Computing	2015
	<b>Lecturer</b> Santa Fe Cosmology Summer School	2015
	<b>Guest Lecturer</b> ASU AST-531, Galaxies and Cosmology	2014
	<b>Lecturer</b> Santa Fe Cosmology Summer School	2014
	<b>Guest Lecturer</b> ASU AST-112, Intro to Stars, Galaxies, and Cosmology	2013
	<b>Guest Lecturer</b> MSU PHSX 520, Electricity and Magnetism II (Jackson)	2008
	<b>Project Manager/Student Mentor</b>	2005– 2009
	Montana State University, Space Science and Engineering Lab.	
<ul style="list-style-type: none"> <li>▪ Managed program and lead students to design, build, and fly their own space hardware.</li> <li>▪ Three successful funding proposals, and two NASA launch manifests.</li> <li>▪ Mentored 40+ students</li> </ul>		
<b>Teaching Assistant</b> MSU PHSX 205, College Physics	2004	

<b>SERVICE</b>	<b>NRAO CASA Users Committee</b> <ul style="list-style-type: none"> <li>▪ Chair <span style="float: right;">2016</span></li> <li>▪ Member <span style="float: right;">2014– 2017</span></li> </ul>
<b>CURRENT STUDENTS</b>	Matthew Kolopanis – ASU Physics Graduate Student Lauren Turner – Senior, ASU SESE - ECHO Michael Horn – Junior, ASU SESE - ECHO (Space Grant Fellow)
<b>FORMER STUDENTS</b>	Jacob Burba – ASU Physics 2016 – Now at Brown for Physics PhD Michael Busch – Graduated ASU, SESE – Now at Johns-Hopkins for Astronomy PhD Ben Stinnett – Graduated ASU SESE <sup>†</sup> , now at Aurobot Inc. Jay Allison – Graduated, ASU SESE 2015 – Currently at Raytheon Mason Denney – Graduated, ASU SESE 2016 David Nelson – undergraduate, SESE – 1991-2014 Victoria Serrano – Graduated ASU Master’s in Electrical Engineering, 2016 Jose Chavez – Graduated, ASU Physics, now at Intel Marc Leatham – Senior, ASU SESE Victoria Serrano – Engineering Masters, now a lecturer at Universidad Tecnológica de Panamá 40+ undergraduates at Montana State University, Space Science and Engineering Lab 10 students in ASU School of Computing capstone course
<b>TALKS</b>	<b>INVITED TALKS</b> <ul style="list-style-type: none"> <li><b>New Horizons in Astrophysics: Exoplanets and the Cosmic Dawn,</b> <span style="float: right;">Sep 2016</span> Invited Colloquium School of Earth and Space Exploration, Tempe, AZ</li> <li><b>HERA Season one data report,</b> <span style="float: right;">Jun 2016</span> Kavli HI 21cm Workshop, Cambridge UK</li> <li><b>MWA Project Update,</b> <span style="float: right;">Jun 2016</span> Kavli HI 21cm Workshop, Cambridge UK</li> <li><b>Progress report from the Hydrogen Epoch of Reionization Array Experiment,</b> <span style="float: right;">Mar 2016</span> Opportunities and Challenges Intensity Mapping, Stanford, Palo Alto, CA</li> <li><b>Lessons learned from 21 cm experiments,</b> <span style="float: right;">Mar 2016</span> Opportunities and Challenges Intensity Mapping, Stanford, Palo Alto, CA</li> <li><b>Probing the Epoch of Reionization with HERA, PAPER, and the MWA,</b> <span style="float: right;">Feb 2016</span> Yale University</li> <li><b>Lecture on The Epoch of Reionization,</b> <span style="float: right;">Mar 2015</span> Santa Fe Cosmology Summer School, St. John’s College</li> <li><b>Colloquium: Chasing our cosmic dawn with HERA.</b> <span style="float: right;">Feb 2015</span> CCAPP, The Ohio State U.</li> <li><b>Chasing our cosmic dawn with HERA.</b> <span style="float: right;">Feb 2015</span> Institute for Advanced Study</li> <li><b>Chasing our cosmic dawn with HERA.</b> <span style="float: right;">Feb 2015</span> Brown University Physics Dept.</li> <li><b>Chasing our cosmic dawn with HERA.</b> <span style="float: right;">Jan 2015</span> University of Illinois, Urbana-Champaign</li> <li><b>Chasing our cosmic dawn with HERA.</b> <span style="float: right;">Feb 2015</span> University of Wisconsin, Madison</li> <li><b>The Murchison Widefield Array Epoch of Reionization Project</b> <span style="float: right;">Dec 2014</span> <i>Early Science from Low Frequency Radio Telescopes, Tempe Az</i></li> <li><b>Lecture, Santa Fe Cosmology Summer School</b> <span style="float: right;">Feb 2015</span> St. John’s College</li> </ul>

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<sup>†</sup>School of Earth and Space Exploration, SESE

<b>LoCo1: Testing Low frequency Astronomy in Space</b> URSI, Boulder, CO	Jan 2014
<b>Shedding light on EoR Foregrounds with PAPER and MWA,</b> URSI,National Radio Science Meeting, Boulder, CO	Jan 2014
<b>Colloquium: Detecting the Epoch of Reionization with Experimental Radio Arrays</b> University of Wisconsin, Milwaukee	Nov 2013
<b>Methods for detecting the 3D percolation of photons in the early universe</b> Biomedical Astronomical Signal Processing Frontiers Workshop	Jan 2013
<b>PAPER: Status and Recent Observations</b> NRAO New Worlds New Horizons, Santa Fe, NM February 2011	Feb 2011
<b>The southern low frequency sky with PAPER</b> University of New Mexico, 2010	May 2010
<b>The Epoch of Reionization with a Precision Array</b> Santa Fe Summer Cosmology school, 10 July 2010	Jul 2010
<b>Astronomer in the Classroom</b> sponsored by the International Year of Astronomy, 2009	Jul 2009
<b>Public Lecture on the Epoch of Reionization</b> Franklin Museum, Philadelphia, PA	Jul 2009
<b>Explorer 1 [PRIME] Satellite Critical Design Review (flight awarded)</b> NASA Space Launch Services Site Visit, Bozeman, MT,	Apr 2009
<b>CONFERENCE TALKS</b>	
<b>Probing the Epoch of Reionization with MWA, PAPER, and HERA,</b> American Physical Society, April Meeting, Salt Lake City, UT	Apr 2016
<b>An External Calibrator for Hydrogen Observatories (ECHO)</b> Early Science for Low Frequency Radio Telescopes (Tempe Meeting II), Albuquerque, NM	Jan 2016
<b>An External Calibrator for Hydrogen Observatories (ECHO)</b> URSI National Radio Science Meeting, Boulder, CO	Jan 2016
<b>Multi-redshift 21 cm observations of the epoch of reionization</b> American Astronomical Society Annual Meeting, Seattle, WA	Jan 2015
<b>Chasing our Cosmic Dawn with the Hydrogen Epoch of Reionization Array</b> National Science Foundation AAPF Fellow's Symposium, Seattle	Jan 2015
<b>Development and Status of early pipelines for MWA and PAPER</b> AAS Exascale Radio Astronomy, Monterey CA	Mar 2014
<b>Shedding Light on Foregrounds with MWA and PAPER Data</b> URSI National Radio Science Meeting, Boulder, CO	Jan 2014
<b>LoCo1: Low Frequency Cosmology in Space</b> URSI National Radio Science Meeting, Boulder, CO	Jan 2014
<b>Comparing MWA/PAPER Instrumental Performance</b> American Astronomical Society, January	Jan 2013
<b>A PAPER Southern Sky Catalog</b> URSI National Radio Science Meeting, Boulder CO	Jan 2012
<b>Catalog and Galactic Emissions with PAPER</b> Aspen Winter Conference	Feb 2010
<b>Recent Results from the Precision Array for Probing the Epoch of Reionization (PAPER) Experiment in South Africa</b> American Astronomical Society	Jan 2010
<b>Global Positioning System on orbit</b> IEEE regional workshop, Big Sky, MT	Mar 2006

	<b>A PAPER Low-Frequency, Wide-Bandwith, All-Sky Radio Point Source Catalog</b>	Jan 2009
	American Astronomical Society, Long Beach, CA	
	<b>Explorer 1 [PRIME] A 50th anniversary reflight</b>	Aug 2005
	Small Satellite Conference, Logan, UT	
<b>OUTREACH</b>	<b>Phoenix ComicCon Panels</b>	Jun 2015
	<i>Panel: Adventures and Disasters in Science</i>	
	<b>Outreach with Star Lab</b>	Oct 2015
	Pascua Yaqui Boys and Girls Club, Mesa Prep Academy, Bioscience High School	
	<b>Science Friday</b>	Feb 2014
	<i>Probing the First Stars with Radio Arrays in the Deep Desert,</i>	
	Tempe Center for the Arts	
	<b>Phoenix ComicCon Panels</b>	Jun 2014
	4 panels, including: SETI, Cubesats, Wait Wait Science, Adventures in Science	
	<b>Grand Awards Judge</b>	May 2013
	Intel Science and Engineering Fair	
	<b>Outreach with Star Lab</b>	Oct 2013
	Salt River Pima Maricopa Reservation	
	<b>Outreach with Radio Detectives</b>	<i>10 appearances in the period: Jan 2012 – present</i>
	School of Earth and Space Exploration Open House	
	<b>Outreach with Radio Detectives</b>	Mar 2013
	Pascua Yaqui Tribal Center	
	<b>Public Lecture</b>	Oct 2012
	ASU Open Door Night	
	<b>Astronomer in the Classroom</b>	Oct 2010
	sponsored by the International Year of Astronomy	
	<b>Physics Society Demonstration Team</b>	
	New Mexico Tech, Socorro, NM	2001 – 2004
		President 2003-2004

[CV compiled on 2018-01-10 for The Internet]