

Daniel C. Jacobs

Education

2011	PhD Astrophysics/Astronomy, University of Pennsylvania <i>The Epoch of Reionization: Foregrounds and calibration with PAPER</i>
2006	MSc Physics, Montana State University
2004	BS (Physics w/ Astrophysics option) New Mexico Institute of Mining and Technology

Research Positions

2014-current	Arizona State University National Science Foundation - Astronomy and Astrophysics Postdoctoral Fellow
2011-current	Arizona State University, Dr. Judd Bowman Postdoctoral Fellow, PAPER, Murchison Widefield Array & Hydrogen Epoch of Reionization Array. Observing the Epoch of Reionization
2009-2011	University of Pennsylvania, Dr. James Aguirre Research Assistant, Precision Array for Probing the Epoch of Reionization (PAPER) Building, commissioning and observing with PAPER
2006-2009	Montana State University, (With Dr. Ron Hellings, Dr. Sachiko Tsuruta and Dr. Shane Larson) Simulating observations with the Laser Interferometric Space Antenna.
2004-2009	Montana State University Space Science and Engineering Laboratory, Dr. David Klumpar Project Manager: Explorer-1 [PRIME] Satellite
2002-2004	Magdalena Ridge Observatory, Dr. David Westpfahl Research Assistant, Developed and deployed instruments for site characterization.

Publications

Pober, J. C. and Liu, A. and Dillon, J. S. and Aguirre, J. E. and Bowman, J. D. and Bradley, R. F. and Carilli, C. L. and DeBoer, D. R. and Hewitt, J. N. and **Jacobs, D. C.** and McQuinn, M. and Morales, M. F. and Parsons, A. R. and Tegmark, M. and Werthimer, D. J., *What Next-Generation 21 cm Power Spectrum Measurements Can Teach Us About the Epoch of Reionization*, submitted to ApJ, arxiv:1310.7031, 2013

Publications (continued)

Daniel C Jacobs, Aaron R Parsons, James E Aguirre, Zaki Ali, Judd Bowman, Richard F Bradley, Christopher L Carilli, David R DeBoer, Matthew Dexter, Nicole E Gugliucci, Pat Klima, Dave HE MacMahon, Jason R Manley, David F Moore, Jonathan C Pober, Irina I Stefan, William P Walbrugh *A Flux Scale for Southern Hemisphere 21cm EoR Experiments*, 2013, ApJ, 776, 108

S. J. Tingay, D. L. Kaplan, B. McKinley, F. Briggs, R. B. Wayth, N. Hurley-Walker, J. Kennewell, C. Smith, K. Zhang, W. Arcus, N. D. R. Bhat, D. Emrich, D. Herne, N. Kudryavtseva, M. Lynch, S. M. Ord, M. Waterson, D. G. Barnes, M. Bell, B. M. Gaensler, E. Lenc, G. Bernardi, L. J. Greenhill, J. C. Kasper, J. D. Bowman, **D. Jacobs**, and 37 others *On the Detection and Tracking of Space Debris Using the Murchison Widefield Array. I. Simulations and Test Observations Demonstrate Feasibility*, 2013, AJ, 146, 103

Parsons, A. R. and Liu, A. and Aguirre, J. E. and Ali, Z. S. and Bradley, R. F. and Carilli, C. L. and DeBoer, D. R. and Dexter, M. R. and Gugliucci, N. E. and **Jacobs, D. C.** and Klima, P. and MacMahon, D. H. E. and Manley, J. R. and Moore, D. F. and Pober, J. C. and Stefan, I. I. and Walbrugh, W. P. *New Limits on 21cm EoR From PAPER-32 Consistent with an X-Ray Heated IGM at $z = 7.7$* , submitted to ApJ, arXiv:1304.4991, 2013

Daniel C Jacobs, Judd Bowman, James E Aguirre, *The precision and accuracy of early Epoch of Reionization foreground models: comparing MWA and PAPER 32-antenna source catalogs*, 2013, ApJ, vol 769, i. 1

Irina I Stefan, Chris L Carilli, David A Green, Zaki Ali, James E Aguirre, Richard F Bradley, David DeBoer, Matthew Dexter, Nicole E Gugliucci, DE Harris, **Daniel C Jacobs**, Pat Klima, David MacMahon, Jason Manley, David F Moore, Aaron R Parsons, Jonathan C Pober, William P Walbrugh *Imaging on PAPER: Centaurus A at 148 MHz*, 2013, MNRAS, vol 432, i. 2

David F Moore, James E Aguirre, Aaron R Parsons, **Daniel C Jacobs**, Jonathan C Pober, *The Effects of Polarized Foregrounds on 21 cm Epoch of Reionization Power Spectrum Measurements*, 2013, ApJ, vol 769, i. 2

Jonathan C Pober, Aaron R Parsons, James E Aguirre, Zaki Ali, Richard F Bradley, Chris L Carilli, Dave DeBoer, Matthew Dexter, Nicole E Gugliucci, **Daniel C Jacobs**, Patricia J Klima, Dave MacMahon, Jason Manley, David F Moore, Irina I Stefan, William P Walbrugh *Opening the 21 cm Epoch of Reionization Window: Measurements of Foreground Isolation with PAPER*, 2013, ApJL, vol 768, i. 2

Parsons, A., Pober, J., Aguirre, J., Carilli, C., **Jacobs, D.**, Moore, D.. *A Per-baseline, Delay-spectrum Technique for Accessing the 21cm Cosmic Reionization Signature*, 2012, ApJ, vol. 756 (2) pp. 165

Pober, J., Parsons, A., **Jacobs, D.**, Aguirre, J., Bradley, R., Carilli, C., Gugliucci, N., Moore, D., Parashare, C. *A Technique for Primary Beam Calibration of Drift-scanning, Wide-field Antenna Elements*. The Astronomical Journal (2012) vol. 143 pp. 53

Parsons, A, McQuinn, M, **Jacobs, D.**, Aguirre, J., & Pober, J., *A Sensitivity and Array-configuration Study for Measuring the Power Spectrum of 21 cm Emission from Reionization*. The Astrophysical Journal (2012) vol. 753 pp. 81

Publications (continued)

Jacobs, Daniel C., Aguirre, James E., Parsons, Aaron R., Pober, Jonathan C., Bradley, Richard F., Carilli, Chris L., Gugliucci, Nicole E., Manley, Jason R., van der Merwe, Carel, Moore, David F., & Parashare, Chaitali R. *New 145 MHz Source Measurements by PAPER in the Southern Sky* 2011, ApJL, 734, L34

Parsons, Aaron R.; Backer, Donald C.; Foster, Griffin S.; Wright, Melvyn C. H.; Bradley, Richard F.; Gugliucci, Nicole E.; Parashare, Chaitali R.; Benoit, Erin E.; Aguirre, James E.; **Jacobs, Daniel C.**; Carilli, Chris L.; Herne, David; Lynch, Mervyn J.; Manley, Jason R.; Werthimer, Daniel J. *The Precision Array for Probing the Epoch of Re-ionization: Eight Station Results*, 2010, AJ, 139, 1468,

Plowman J. E., **Jacobs D. C.**, Hellings R. W., Larson S. L., Tsuruta S., *Constraining the black hole mass spectrum with gravitational wave observations - I. The error kernel* 2010, MNRAS, 401, 2706

Teaching and Mentoring

2013	Galaxies and Cosmology, graduate Three lectures
2012	Introduction to Galactic and Extragalactic Astrophysics, undergraduate Two lectures
2008	Electricity and Magnetism, graduate Two lectures
2006-2009	Project Manager, Student Mentor Space Sciences and Engineering Lab. Montana State University. Helped 100+ students from under-represented and rural backgrounds to design, build, and fly their own space hardware. Three successful funding proposals, and two NASA launch manifests.

Synergistic Activities and Awards

Member	Murchison Widefield Array (MWA) 2011-present
Member	Precision Array for Probing the Epoch of Reionization (PAPER) 2008- present
Contributor	PAPER proposal (successful) to NSF; Rich Bradley & Aaron Parsons, PI, 2011
Contributor	Capital grant proposal to Mt. Cuba Astronomical Foundation (successful) for PAPER data storage initiative, 2010
Contributor	Spacebuoy Ionosphere Satellite Sonde network proposal (successful), Airforce Nanosat competition, 2008
Lead	Explorer 1 [PRIME] NASA Launch opportunity (successful), 2008
Contributor	Spacebuoy Ionosphere Satellite Sonde network proposal (successful), Airforce Nanosat competition, 2007
Recipient	APS travel grant 2010
Member	Space Science and Engineering Laboratory, Montana State University 2004 - 2009
Member	American Astronomical Society 2009 - present
Member	American Physical Society 2001 - present
Member	Sigma Pi Epsilon 2004 - present
Recipient	APS Marsh White Award, for Physics Demonstrations, 2003 (as member New Mexico Tech physical society)

Technical Skills

Languages	Python, Bash, C, MATLAB, MPI, Perl, IDL, Assembly, PHP
Tools & Services	Virtual Observatory tools (votables, astrogrid), Sun Grid Engine, Linux, OS X, SQL, Maple, Gnuplot, Git
Hardware	RF, precision GPS, High Performance Computing, Data Intensive Super Computing, CASPER/ROACH, Satellite systems
Field Experience	Remote site deployments in Green Bank, WV and Karoo, South Africa. Desert and altitude conditions. Lead on ground-breaking SA expedition.
Large Projects	Program management (scheduling, budget, configuration control, personnel), Systems engineering (project proposal, definition, interface management, user interfaces), NASA style design reviews, Code versioning and milestone management

Abstracts

Jacobs, D et al *Comparing MWA/PAPER instrumental performance*, American Astronomical Society, 2013

Jacobs, D et al *A PAPER Southern Sky Catalog*, URSI, 2012

Jacobs, D.; Pober, J.; *PAPER: status and recent observations*, NRAO New Science Conf., (<https://science.nrao.edu/newscience/program>) 2011

Jacobs, D. *Update on PAPER: Deployments, foreground catalogs, and power spectrum*, Aspen 2010 Winter Conference (<http://wise-obs.tau.ac.il/~barkana/aspenP.html>), 2010

Aguirre, J.; **Jacobs, D. (presenting)**; and the PAPER Team, *A PAPER Low-Frequency, Wide-Bandwidth, All-Sky Radio Point Source Catalog*, American Astronomical Society, 2009

Backer, D.; **Jacobs, D (presenting)**, and the PAPER Team.; *Recent Results from the Precision Array for Probing the Epoch of Reionization (PAPER) Experiment in South Africa*, American Astronomical Society, 2010

Jacobs, Danny C.; Edwards, Brett; Stelly, Zak; Gorgievskaya, Ivana; Westpfahl, David J.; Klinglesmith, Daniel A., III; Creech-Eakman, Michelle J., *A new instrument for measuring atmospheric turbulence*, 2004, Proc. SPIE 5491,1290

Outreach

2013	Grand Awards Judge Intel Science and Engineering Fair
2013	Outreach with Star Lab Salt River Pima Maricopa Reservation
2013	Outreach with Radio Detectives School of Earth and Space Exploration Open House
2013	Outreach with Radio Detectives Pascua Yaqui Tribal Center
2012	Public Lecture ASU Open Door Night
2012	Outreach with Radio Detectives School of Earth and Space Exploration Open House

Outreach (continued)

2010	Astronomer in the Classroom , sponsored by the International Year of Astronomy
2004	Teaching Assistant , Montana State University, Physics Dept.
2003-2004	President NMT Physics Society and Demonstration Team, Led several significant hands-on outreach events: scale model medieval trebuchet (first place in Socorro parade, first place in Estancia launching competition), annual K-12 paper airplane contest, second annual children's rocket building and launching event.
2001-2003	Member NMT Physics Society and Demonstration Team. Performed entertaining and educational physics demonstrations for all ages.

Presentations

- LoCo1: Testing Low frequency Astronomy in Space, Invited Speaker, URSI, 2014
- Shedding light on EoR Foregrounds with PAPER and MWA, Invited Speaker, URSI, 2014
- Detecting the Epoch of Reionization with Experimental Radio Arrays, Colloquium, University of Wisconsin, Milwaukee November 2013
- Methods for detecting the 3D percolation of photons in the early universe, Invited Talk, Biomedical Astronomical Signal Processing Frontiers Workshop, January, 2013
- Comparing MWA/PAPER Instrumental Performance, American Astronomical Society, January, 2013
- PAPER: Status and Recent Observations, NRAO New Worlds New Horizons, Santa Fe, NM February 2011
- The southern sky with PAPER, University of New Mexico, 2010
- The Epoch of Reionization with a Precision Array, Santa Fe Summer Cosmology school, 10 July 2010
- Catalog and Galactic Emissions with PAPER, Aspen Winter Conference. 4 Feb 2010
- Recent Results from the Precision Array for Probing the Epoch of Reionization (PAPER) Experiment in South Africa, American Astronomical Society, 2010
- Outreach to elementary schoolchildren via Astronomer in the Classroom sponsored by the International Year of Astronomy, 2009
- Public Lecture, Exploring the Epoch of Reionization, 2009, Philadelphia Franklin Museum
- A PAPER Low-Frequency, Wide-Bandwidth, All-Sky Radio Point Source Catalog, American Astronomical Society, 2009
- Explorer 1 [PRIME] Satellite Critical Design Review (successful), NASA Launch Services, 2009
- Global Positioning System on orbit, IEEE regional workshop, Big Sky, MT, 2006
- Explorer 1 [PRIME] A 50th anniversary reflight. Small Satellite Conference, Logan, UT 2005