

CURRICULUM VITAE  
Aaron R. Parsons

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#### EDUCATION

University of California, Berkeley	
Ph.D., Astrophysics. Advisor: Donald C. Backer	Dec. 2009
M.A., Astrophysics	Sept. 2006
Harvard University, Double B.A., Physics and Mathematics, <i>cum laude</i>	June, 2002

#### PROFESSIONAL POSITIONS

Assistant Professor	2011-
Dept. of Astronomy, U. California, Berkeley	
NSF Astronomy and Astrophysics Postdoctoral Fellow	2009-2011
Dept. of Astronomy, U. California, Berkeley	
Charles H. Townes Postdoctoral Honorary Fellow	2009-2011
Space Sciences Laboratory, U. California, Berkeley	
NAIC Pre-Doctoral Researcher	2007-2009
Arecibo Observatory, Puerto Rico. Local Supervisor: C. Salter	
Graduate Student Researcher	2004-2009
Dept. of Astronomy, U. California, Berkeley. Advisor: D. Backer	
Junior Development Engineer	2002-2004
Space Sciences Laboratory, U. California, Berkeley. Supervisor: D. Werthimer	

#### HONORS AND AWARDS

NSF CAREER Grant	2014
NSF AAPF Postdoctoral Fellow	2009
Charles H. Townes Postdoctoral Fellow	2009
Mary Elizabeth Uhl Prize for Outstanding Scholarly Achievement	2009
International Union of Radio Science (URSI) Young Scientist Award	2005
UC Berkeley Space Sciences Summer Fellow	2005
Harvard College Scholarship for Academic Excellence	2002
Robert C. Byrd Honors Scholarship	1998
Julius Poole Scholarship	1998
Elk's Scholarship	1998

#### PROFESSIONAL ACTIVITIES

PI of HERA; PI of PAPER; CASPER advisory board; Radio Astronomy Laboratory member; URSI Comm. J member; AAS member; developer, AIPY software toolkit, developer, AstroBaki website

#### RESEARCH INTERESTS: ASTROPHYSICS AND RADIO ASTRONOMY INSTRUMENTATION

Formation and evolution of large-scale cosmic structure  
Galaxy evolution and star formation in the early universe  
Cosmological and inflationary physics  
Data analysis and techniques for measuring 21cm reionization  
Design and calibration of radio, millimeter, and sub-mm interferometers  
Design of digital signal processing systems, hardware, and algorithms

## PEER-REVIEWED PUBLICATIONS

Pober, J., A. Liu, J. Dillon, J. Aguirre, J. Bowman, R. Bradley, C. Carilli, D. DeBoer, J. Hewitt, D. Jacobs, M. McQuinn, M. Morales, **A. Parsons**, M. Tegmark, D. Werthimer, "What Next-Generation 21 cm Power Spectrum Measurements Can Teach Us About the Epoch of Reionization," *Accepted to ApJ*, ArXiv 1310.7031. 2013.

Jacobs, D., **A. Parsons**, J. Aguirre, Z. Ali, J. Bowman, R. Bradley, C. Carilli, D. DeBoer, M. Dexter, N. Gugliucci, P. Klima, D. MacMahon, J. Manley, D. Moore, J. Pober, I. Stefan, W. Walbrugh, "A Flux Scale for Southern Hemisphere 21 cm Epoch of Reionization Experiments," *Astrophysical Journal*, 776, 108, October 2013.

Stefan, I., C. Carilli, D. Green, Z. Ali, J. Aguirre, R. Bradley, D. DeBoer, M. Dexter, N. Gugliucci, D. Harris, D. Jacobs, P. Klima, D. MacMahon, J. Manley, D. Moore, **A. Parsons**, J. Pober, W. Walbrugh, "Imaging on PAPER: Centaurus A at 148 MHz," *Monthly Notices of the Royal Astronomical Society*, 432, 1285-1293, 3, June 2013.

D. Moore, J. Aguirre, **A. Parsons**, D. Jacobs, J. Pober, "The Effects of Polarized Foregrounds on 21 cm Epoch of Reionization Power Spectrum Measurements," *Astrophysical Journal*, 769, 154, June 2013.

J. Pober, **A. Parsons**, J. Aguirre, Z. Ali, R. Bradley, C. Carilli, D. DeBoer, M. Dexter, N. Gugliucci, D. Jacobs, P. Klima, D. MacMahon, J. Manley, D. Moore, I. Stefan, W. Walbrugh, "Opening the 21 cm Epoch of Reionization Window: Measurements of Foreground Isolation with PAPER," *Astrophysical Journal Letters*, 768, L36, May 2013.

**A. Parsons**, A. Liu, J. Aguirre, Z. Ali, R. Bradley, C. Carilli, D. DeBoer, M. Dexter, N. Gugliucci, D. Jacobs, P. Klima, D. MacMahon, J. Manley, D. Moore, J. Pober, I. Stefan, W. Walbrugh, "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. April 2013.

Pober, J., **A. Parsons**, D. DeBoer, P. McDonald, M. McQuinn, J. Aguirre, Z. Ali, R. Bradley, T.-C. Chang, and M. Morales, "The Baryon Acoustic Oscillation Broadband and Broad-beam Array: Design Overview and Sensitivity Forecasts," *Astronomical Journal*, 145, 65, March 2013.

**Parsons, A.**, J. Pober, J. Aguirre, C. Carilli, D. Jacobs, D. Moore, "A Per-Baseline, Delay-Spectrum Technique for Accessing the 21cm Cosmic Reionization Signature," *Astrophysical Journal*. 756, 165, August 2012.

**Parsons, A.**, J. Pober, M. McQuinn, D. Jacobs, J. Aguirre, "A Sensitivity and Array-Configuration Study for Measuring the Power Spectrum of 21cm Emission from Reionization," *Astrophysical Journal*, 753, 81, July 2012.

Pober, J., **A. Parsons**, D. Jacobs, J. Aguirre, R. Bradley, C. Carilli, N. Gugliucci, D. Moore, C. Parashare, "A Technique for Primary Beam Calibration of Drift-Scanning, Wide-Field Antenna Elements," *Astronomical Journal*, 143, 53P. February 2012.

Jacobs, D., J. Aguirre, **A. Parsons**, J. Pober, R. Bradley, C. Carilli, N. Gugliucci, J. Manley, C. van der Merwe, D. Moore, C. Parashare. "New 145 MHz Source Measurements by PAPER in the Southern Sky," *Astrophysical Journal Letters*, 734, L34+, June 2011.

S. Gowda, **A. Parsons**, R. Jarnot, D. Werthimer. "Automated Placement for Parallelized FPGA FFTs," *IEEE 19th International Symposium on Field-Programmable Custom Computing Machines*, 206-209, May 2011.

**Parsons, A.**, D. Backer, R. Bradley, J. Aguirre, E. Benoit, C. Carilli, G. Foster, N. Gugliucci, D. Herne, D. Jacobs, M. Lynch, J. Manley, C. Parashare, D. Werthimer, M. Wright. "The Precision Array for Probing the Epoch of Re-ionization: Eight Station Results," *Astronomical Journal*, 139, 1468-1480, April 2010.

**Parsons, A.**, D. Backer. "Calibration of Low-Frequency, Wide-Field Radio Interferometers Using Delay/Delay-Rate Filtering," *Astronomical Journal*, 138, 219-226. July 2009.

**Parsons, A.** "The Symmetric Group in Data Permutation, with Applications to a High-Bandwidth Streaming FFT Architecture," *IEEE Signal Processing Letters*. 16, 6, 477-480. June 2009.

**Parsons, A.**, D. Backer, H. Chen, P. Droz, T. Filiba, D. MacMahon, J. Manley, P. McMahon, A. Parsa, A. Siemion, D. Werthimer, M. Wright. "A Scalable Correlator Architecture Based on Modular FPGA Hardware, Reusable Gateware, and Data Packetization," *Publications of the Astronomical Society of the Pacific*, 120, 873, 1207-1221. November 2008.

Stanimirović, S. , M. Putman, C. Heiles, J. Peek, P. Goldsmith, B. Koo, M. Krčo, J. Lee, J. Mock, E. Muller, J. Pandian, **A. Parsons**, Y. Tang, D. Werthimer. "First Results from the Arecibo Galactic H I Survey: The Disk/Halo Interface Region in the Outer Galaxy," *Astrophysical Journal*, 653, 1210-1225, Dec. 2006.

**Parsons, A.**, D. Backer, C. Chang, D. Chapman, H. Chen, P. Crescini, C. de Jesus, C. Dick, P. Droz, D. MacMahon, K. Meder, J. Mock, V. Nagpal, B. Nikolic, A. Parsa, B. Richards, A. Siemion, J. Wawrzynek, D. Werthimer, M. Wright. "PetaOp/Second FPGA Signal Processing for SETI and Radio Astronomy (Invited Paper)," *Proc. Asilomar Conference on Signals and Systems, Pacific Grove, CA*. November 2006.

**Parsons, A.**, D. Backer, D. Werthimer, M. Wright. "A New Approach to Radio Astronomy Signal Processing: Packet Switched, FPGA-based, Upgradeable, Modular Hardware and Reusable, Platform-Independent Signal Processing Libraries," *Proc. URSI Conference, Boulder, CO*. January 2006.

## WHITE PAPERS

**Parsons, A.**, D. Werthimer, D. Backer, T. Bastian, G. Bower, W. Brisken, H. Chen, A. Deller, T. Filiba, D. Gary, L. Greenhill, D. Hawkins, G. Jones, G. Langston, J. Lazio, J. van Leeuwen, D. Mitchell, J. Manley, A. Siemion, H. Kwok-Hay So, A. Whitney, D. Woody, M. Wright, K. Zarb-Adami "Digital Instrumentation for the Radio Astronomy Community," *Astro2010 Decadal Survey White Paper in TEC: Technology Development*, April, 2009.

Backer, D., J. Aguirre, J. Bowman, R. Bradley, F. Briggs, C. Carilli, S. Furlanetto, L. Greenhill, J. Hewitt, C. Lonsdale, M. Morales, **A. Parsons**, S. Tingay, A. Whitney. "HERA Hydrogen Epoch of Reionization Arrays," *Astro2010 Decadal Survey White Paper in RMS: Radio and Millimeter/Submillimeter Facilities*, April, 2009.

## EXTERNAL RESEARCH SUPPORT

Title: CAREER: Novel Approaches and Instrumentation for 21cm Cosmology Experiments  
 PI: Aaron Parsons  
 Detail: Begin: 09/01/2015, End: 08/31/2019, Budget: \$787,369

Title: Collaborative Research: Precision Array for Probing the Epoch of Reionization (PAPER)  
 PI: Aaron Parsons  
 Detail: Begin: 09/01/2011, End: 08/31/2015, Budget: \$2,629,198

Title: Advanced Multibeam Spectrometer for the GBT (completed)  
 PI: Dan Werthimer  
 Detail: Begin: 09/01/2010, End: 08/31/2013, Budget: \$1,100,000

Title: Detecting Cosmic Reionization via Low-Frequency Interferometry (completed)  
 PI: Aaron Parsons  
 Detail: Begin: 09/01/2009, End: 06/31/2011, Budget: \$249,000

Title: Collaborative Research: Precision Array for Probing the Epoch of Reionization (PAPER) (completed)  
 PI: Aaron Parsons (formerly Donald Backer)  
 Detail: Begin: 07/15/2008, End: 06/30/2012, Budget: \$944,512

## TEACHING

Instructor, <i>Undergraduate Radio Astronomy Laboratory</i>	Spring 2014
Instructor, <i>Radiative Processes in Astrophysics</i>	Fall 2013
Instructor, <i>Graduate Radio Astronomy: Tools and Techniques</i>	Fall 2012, Fall 2011
Co-Instructor, <i>Undergraduate Radio Laboratory</i>	Spring 2011, Spring 2010

## SUPERVISORY ROLES

**Post-Doctoral Researchers:** A. Liu (2012-)

**Graduate Students:** C. Cheng (2014-), Z. Ali (2012-), J. Pober (2009-2013), T. Filiba (2009-2013), J. Landon (BYU; 2009-2010), J. Manley (U. Cape Town; 2007-2009)

**Scientific/Engineering Staff:** T.D. Leung (2013-), G. Hsyu (2012-), Z. Ali (2010-2012), M. Dexter (2010-), D. MacMahon (2010-), M. Wagner (2009-2013), W. Mallard (2009-2010), G. Foster (2007-2009), O. Milgrome (2007), H. Chen (2004-2007)

**Undergraduate Students:** M. Presley (2014), T.D. Leung (2013), G. Hsyu (2011-2012), M. Kandrashoff (2011), K. Sanchez (2010-2012), Z. Ali (2010), N. Duong (2010), A. Parsa (2007), C. Lin (2006), K. Meder (2006), A. Simeion (2005-2006), D. Chapman (2005), C. de Jesus (2004), P. Crescini (2004), H. Chen (2003), W. Sim (2003), C. Conroy (2003)