

C.V. for Steven Murray

CONTACT INFORMATION

School of Earth and Space Exploration
Arizona State University,
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in steven-g-murray

steven-murray

ACADEMIC REFERENCES

Prof. Judd Bowman

judd.bowman@asu.edu

(+1)480 965-8880

Dr. Cathryn Trott

cathryn.trott@curtin.edu.au

(+61)8 9266 1306

Prof. Andrei Mesinger

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RESEARCH INTERESTS

21cm Cosmology:

validation, parameter inference, statistical foreground modelling, connecting instruments to theoretical predictions, simulations.

Large-scale structure:

halo mass function, halo model, warm dark matter, fast synthetic catalogues.

Astrostatistics:

hierarchical Bayesian models, non-parametric statistics, count distributions, PCA.

Software and computing:

high-standard development practices, accessible web-applications for the community, robust mathematical tools in Python.

EDUCATION

University of Western Australia

Perth, Western Australia

PhD, Physics

(2012–2015)

– Thesis Title:

Next-generation tools for next-generation surveys

– Supervisors:

Prof. Chris Power, Dr. Aaron Robotham

– Area of Study:

Cosmology/Structure formation

– Courses Taken:

– General Relativity (HD)

– Computer Intensive Methods in Statistics (D)

– Bayesian Astronomy in R

Honours, Physics

(2011)

– Graduated:

First Class

– Thesis Topic:

Large-Scale Structure in the SDSS and GAMA surveys

– Supervisor:

Prof. John Hartnett

– Courses Taken:

– Differential Geometry (HD)

– Mathematical Methods (HD)

– Computational Quantum Mechanics (D)

– Astrophysics (D)

University of Queensland

Brisbane, Queensland, Australia

Bachelor of Science in Mathematics

(2007-2009)

– Graduated:

GPA of 6.583/7

PROFESSIONAL EXPERIENCE

Arizona State University

Tempe, Arizona

HERA/EDGES Postdoc, (2018 –)

Curtin University, Perth, Western Australia
CAASTRO Postdoc, (2015 – 2018)

University of Western Australia, Perth, Western Australia
APA funded PhD student, (2012 – 2015)

ICRAR/Pawsey, Perth, Western Australia
ICRAR/Pawsey Summer Internship, (2011 – 2012)

University of Western Australia, Perth, Western Australia
First-year Physics Lab Demonstration Tutor, (2011)

University of Queensland, Brisbane, Queensland
First-year Mathematics Tutor, (2009)

SOFTWARE Complete information at github.com/steven-murray.

Organizations

Most of my software development occurs within teams, which are listed here (only organizations in which I've been active in the last year and are a member are listed). Each column gives the total number of my contributions made to the organization, and then shows the relative contribution (percentage) of the contributions in the form of **C**ommits, **P**Rs, **I**ssues and **R**eviews.

Github Org	Description	Contr.	[C P I R]
edges-collab	Collection of codes for working with EDGES data	895	[767 17 79 32]
HERA-Team	Collection of software used for the HERA radio telescope	500	[382 33 35 50]
halomod	Halo Model calculations	203	[102 67 24 10]
21cmfast	Core team that develops 21cmFAST and associated packages	165	[133 10 12 10]
RadioAstronomySoftwareGroup	Foundational software tools for radio astronomy	30	[019 02 02 07]
rasg-affiliates	Projects affiliated with the RadioAstronomySoftwareGroup.	27	[025 01 00 01]

Original Codes

Here I list notable codes that I originally authored and maintain. Much of my current development work occurs in collaborative software, which is listed below.

Key: ☆ GH Stars | 🍴 Forks

Repo	Description	☆	🍴
halomod/hmf	Python halo mass function calculator	51	30
steven-murray/hankel	Implementation of Ogata's (2005) method for Hankel transforms.	37	05
halomod/halomod	Python package for dealing with the Halo Model	16	09
steven-murray/powerbox	A python package for making arbitrarily structured, arbitrary-dimension boxes	14	05
halomod/TheHaloMod-SPA	Single-page app for TheHaloMod	03	00
steven-murray/mrpy	A Python package for calculations with the MRP parameterisation of the Halo Mass Function.	01	01

Collaborative Codes

Here I list notable codes that I contribute to collaboratively. They are listed in descending order of my total number of contributions.

Key: ☆ GH Stars | 🍴 Forks | 📊 My Rank as Contributor | ➕ My Contributions

Repo	Description	☆	🍴	➕	📊
21cmFAST	Official repository for 21cmFAST: a code for generating fast simulations of the cosmological 21cm signal	25	12	867 (61%)	1/9
hera_sim	Simple simulation code for HERA-like redundant interferometric arrays	13	7	469 (31%)	2/17
edges-analysis	Analysis pipeline for EDGES field data.	0	0	435 (70%)	1/5
21CMMC	Constrain 21cmFAST parameters using MCMC	2	4	397 (62%)	1/5
edges-cal	Code to calibrate EDGES data	0	0	367 (93%)	1/4
edges-io	Module for reading EDGES data and working with EDGES databases	0	0	347 (94%)	1/4
edges-estimate	Analysis code for fitting EDGES data with foregrounds and 21 cm signatures	0	0	121 (84%)	1/4
read_acq	Read EDGES ACQ files with Python	1	0	117 (92%)	1/4
hera-validation	Archive of formal software pipeline validation tests	0	3	105 (24%)	2/11
21cmSense	Code for calculating the sensitivity of 21cm experiments to the EoR power spectrum	0	1	95 (57%)	1/4

ACADEMIC EXPERIENCE

Grants

2012 – Present

- S. Furlanetto, J. Mirocha, P. La Plante, D. Jacobs, S. G. Murray, 2022, ‘*A new window into galaxy physics and environments during cosmic dawn through cross-correlations*’, NASA ATP.
- S. G. Murray et. al., 2021, ‘*Unveiling Cosmic Dawn with HERA*’, XSEDE Allocation.
- S. G. Murray et. al., 2020, ‘*Unveiling Cosmic Dawn with HERA*’, XSEDE Startup Allocation.
- Lisa Kewley et al. (Murray listed as Ass. Investigator), 2017, ‘*ASTRO 3D*’, ARC CoE.
- Chris Power et. al., 2013, ‘*Fast, approximate synthetic universes for the SKA*’, UWA Research Collaboration Awards.
- Chris Power, S. G. Murray, 2012, ‘*Building model universes for the Square Kilometre Array and its pathfinders*’, UWA Research Collaboration Awards.
- Aaron Robotham et al., 2012, ‘*Building galaxies with trees*’, UWA Research Collaboration Awards.

Collaborations

2013 – Present

- Network for Exploration and Space Science [CI Jack Burns], (2020 –)
- EDGES [CI Judd Bowman], (2019 –)
- 21cmFAST [CI Andrei Mesinger], (2019 –)
- HERA [CI Dave DeBoer], (2018 –)
- GENESIS Project (Primary Liaison between MWA EoR and GENESIS) [CI Chris Power & Cath Trott], (2017 – 2018)
- ASTRO 3D (Affiliate Investigator, Listed as Associate Investigator on Proposal) [CI Lisa Kewley], (2017 –)
- SKA CD/EoR SWG [CI Leon Koopmans], (2017 –)
- MWA EoR Team, ICRAR/Curtin [CI Cathryn Trott], (2015 – 2018)
- Computational Theory Group, ICRAR/UWA [CI Chris Power], (2013 – 2018)
- UAM, Madrid [CI Alexander Knebel], (2013 – 2014)

Memberships and Committees	2012 – Present
<ul style="list-style-type: none"> – HERA DE&I Committee [Chair], (2022 – 2022) – HERA Ombudsperson [Ombudsperson], (2021 –) – SKA CD/EoR SWG [Member], (2017 –) – ASA [Member], (2017 –) – CAASTRO Postdoc Committee [Member], (2016 – 2018) – CAASTRO Student Committee [Chair], (2014 – 2015) – CAASTRO [Member], (2012 – 2018) 	
Journal Referee	2017 – Present
<ul style="list-style-type: none"> – Referee for A&A (2021 –) – Referee for JOSS (2019 –) – Referee for MNRAS (2017 –) 	
Supervision	2017 – Present
<ul style="list-style-type: none"> – Supervised Undergraduate : Dhanush Giriyan (2021 – 2021) – Co-supervised Undergraduate : ASU Soft. Eng. Capstone Team (2021 – 2022) – Supervised Undergraduate : ASU Soft. Eng. Capstone Team (2020 – 2021) – Supervised Undergraduate : Lily Whitler (2019 – 2020) – Co-supervised PhD student: Bella Nasirudin (2017 – 2020) 	
Teaching	2004 – Present
<ul style="list-style-type: none"> – First-Year Undergraduate Physics: <i>Lab Demonstration; Report Grading</i> (UWA, 2011 – 2011) – First-Year Undergraduate Mathematics: <i>Class Tutor; Assignment Grading</i> (UQ, 2009 – 2009) – Yr 10-12 Mathematics: <i>Private Tutor</i> (Private, 2006 – 2010) – Yr 10-12 Chemistry: <i>Private Tutor</i> (Private, 2006 – 2010) – Yr 10-12 Physics: <i>Private Tutor</i> (Private, 2006 – 2010) – Grades Pre-2 Piano: <i>Private Tutor</i> (Private, 2004 – 2020) 	
Outreach	2016 – Present
<ul style="list-style-type: none"> – Outreach video for ASU Open Door (Arizona State University, 2021) – Outreach stall at ASU Open Door (Arizona State University, 2020) – Elementary School Presentation: “Deserts and Radio Astronomy” (Eagleridge Enrichment Center, 2019) – Outreach Stall at Perth Science Festival (Claremont Showgrounds, 2018) – Q and A Session (Pilgrim Primary school SA via Skype, 2017) – Q and A Session (Penguin District School, TAS via Skype, 2017) – School Science Club Presentation: “From Plasma to Planets: How the Universe formed Structures out of Soup” (Perth Modern School, 2017) – CAASTRO in the Classroom Lecture: “Special Relativity” (Aurora College, NSW via Skype, 2017) – CAASTRO in the Classroom Lecture: “Special Relativity” (NSW Schools via Skype, 2016) 	
Industry and Inter-disciplinary Engagement	2016 – Present
<ul style="list-style-type: none"> – ASU: 21cmSense: A web-app for computing 21cm array sensitivities (2021 – 2022). <i>Successful proposal for and supervision of Software Engineering Capstone project team to work on web development of 21cmSense.</i> – ASU: TheHaloMod: An Online Calculator for the halo model (2020 – 2021). <i>Successful proposal for and supervision of Software Engineering Capstone project team to work on web development of my site TheHaloMod.</i> – WesCEF: Spectroscopy for soil nutrient analysis (17/04/2018 – 17/04/2018). <i>Consulting on data analysis of spectroscopic measurements of crops to diagnose soil nutrient issues.</i> 	

- **Atlassian:** Atlassian ShipIT Hackathon (08/09/2016 – 09/09/2016). *Hackathon dedicated to shipping new and novel ideas in 24 hours.*

Professional Training

2013 – Present

- Laboratory Safety Training (ASU) (Oct 2018)
- HDR Supervisor Induction (Feb 2017)
- MWA Data Reduction Workshop (May 2016)
- Code Testing for HPC (ASA Webinar Series) (Jul 2014)
- Bayesian Astronomy with R (Jul 2013)

Personal Training

2015 – Present

- Visual Communication for Scientists (Jul 2017)
- Stress Management and Resilience (Nov 2017)
- The Perfect Pitch (Nov 2017)
- Atlassian ShipIt Hackathon (5th place) (Jul 2016)
- Conversations at the Right Wavelength (Dec 2015)
- How to benefit from and contribute to Open Science (Dec 2015)
- Building Strong Leaders (Dec 2015)
- Creative Thinking in the Workplace (Dec 2015)
- ICRAR Media Training Workshop (Jul 2015)

AWARDS AND SCHOLARSHIPS

ASU

- Accepted Proposal for ASU Soft. Eng. Capstone Project (2020, for 1 year)
- Accepted Proposal for ASU Soft. Eng. Capstone Project (2021, for 1 year)

Curtin

- Most Entertaining Talk at ICRAR-CON (2017)
- Most Scientifically Challenging Talk at ICRAR-CON (2017)
- Best Overall Talk, CAASTRO Retreat (2017)

UWA

- Ernest and Evelyn Shacklock Scholarship (2012, for 3 years)
- CAASTRO Student Talk Prize (2012)
- Most Exciting Talk at ICRAR-CON (2014)

ICRAR

- ICRAR/Pawsey Summer Internship (2011, for 10 weeks)

UQ

- UQ Excellence Scholarship (2007, for 3 years)
- Dean’s Commendation for High Achievement (2007, for 3 years)

TECHNICAL SKILLS

Proficiency with Linux (Ubuntu and Arch) operating systems. Working knowledge of Windows and MacOS operating systems

Intimate knowledge of a variety of programming languages, in particular Python, Fortran and C, and to varying extents R, HTML, CSS, Javascript and SQL.

In-depth experience with matplotlib, numpy, scipy, emcee, emacs, git, GitHub, astropy, pyyaml and programs and frameworks, and to varying extents django, plotly-dash, bokeh, pandas and regex.

PRESENTATIONS

Invited Talks

1. “Overview of new 21cmFAST and 21cmMC” at Inaugural 21cmFAST Developers Workshop, Pisa, Italy (Sep 2019)
2. “Bayesian Insights for EDGES data” at URSI AT-AP-RASC, Gran Canaria, Canary Islands (May 2022)
3. “[An Update on the Progress of EDGES](#)” at URSI GASS, Rome, Italy (Aug 2021)

Seminars

1. “[Building Confidence in Next-Generation 21cm Cosmology: A Forward-Model Approach](#)”, University of Melbourne (Virtual) (04/05/2021)
2. “[Building Confidence in Next-Generation 21cm Cosmology: A Forward-Model Approach](#)”, Imperial College London (19/05/2021)
3. “[Building Confidence in Next-Generation 21cm Cosmology: A Forward-Model Approach](#)”, Curtin University (22/09/2021)
4. “[An Update on the Progress of EDGES: The Hunt for Cosmic Dawn](#)”, Colorado University (24/09/2021)

Contributed Talks

1. “[Making EDGES Bayesian](#)” at Global 21cm Workshop, Montreal, Canada (Oct 2019)
2. “[Bridging the Great Divide: Connecting Physical Foregrounds with Interferometric Instruments](#)” at Rise and Shine, Strasbourg, France (Jun 2018)
3. “[Getting the Edge on the Wedge](#)” at ANITA Theory Workshop, Perth, Australia (Feb 2018)
4. “[The Wedge and the Window](#)” at CAASTRO Annual Retreat, Adelaide, Australia (Nov 2017) [**Prize for Best overall talk**]
5. “[Between Wedge and Window: An Improved Statistical Point-Source Foreground Model for the EoR](#)” at Peering Towards Cosmic Dawn, Dubrovnik, Croatia (Oct 2017)
6. “[The Wedge and the Window](#)” at ICRAR CON, Mandurah, Australia (Sep 2017) [**Prize for Most scientifically challenging talk and Most entertaining talk**]
7. “[Between Wedge and Window: An Improved Statistical Point-Source Foreground Model for the EoR](#)” at Fundamental Physics with the SKA, Flic-en-Flac, Mauritius (May 2017)
8. “[Realistic Visibility Covariance for the EoR in the presence of . . . well, just about everything.](#)” at ANITA Theory Workshop, Hobart, Australia (Feb 2017)
9. “[An Improved Statistical Foreground Model for the EoR](#)” at CAASTRO Annual Retreat, Busselton, Australia (Nov 2016)
10. “[A Simple Halo Mass Function Distribution](#)” at Diving into the Dark, Cairns, Australia (Jul 2016)
11. “[Eddington Bias vs. Hierarchical Bayes in the Halo Mass Function](#)” at Statistical Challenges in 21st Century Cosmology, Chania, Greece (May 2016)
12. “[Simplifying the Halo Mass Function](#)” at ICRAR CON, Rottnest Island, Australia (Sep 2015)
13. “[Dark Matters](#)” at CAASTRO Annual Retreat, Twin Waters, Australia (Nov 2014)
14. “[HALOgen: A Fast Approximate Halo Generator](#)” at ICRAR CON, Rottnest Island, Australia (Sep 2014) [**Prize for Most Exciting Talk**]




15. “[HALOgen](#)” at nIFTy Cosmology, Madrid, Spain (Jun 2014)
16. “[Tools and Statistics with Dark Matter Halos](#)” at ANITA Theory Workshop, Sydney, Australia (Feb 2014)
17. “The Generalised 2-Point Correlation Function” at ANITA Theory Workshop, Brisbane, Australia (Feb 2013)
18. “The Generalised 2-Point Correlation Function” at CAASTRO Annual Retreat, Pinnacles, Australia (Sep 2012) [**Prize for Best Student Talk**]
19. “[An Update on the Progress of EDGES](#)” at Global 21cm Workshop, Boulder, USA (Oct 2021)
20. “[EDGES Calibration Pipeline](#)” at Global 21cm Workshop, Cambridge, UK (Oct 2020)
21. “[Current Status and Future Plans for EDGES](#)” at Next-Generation Cosmology with Next-Generation Radio Telescopes: II, Sesto, Italy (Jan 2020)

PUBLICATIONS




To see a configurable list of all my publications, see my ADS list¹. Information correct as of 14 Feb 2022. Any arxiv e-prints displayed have been accepted. Papers in each category listed in reverse chronological order. Papers with more than 5 citations per year highlighted in [orange](#).













At a Glance

Total Papers	42	M-index	1.6
Normalized Papers	6.1	G-index	30
Total Citations	944	I10-index	21
Total Norm. Citations	145.0	I100-index	2
H-index	16	Tori-index	2.0







Key:  Papers,  Citations,  Reads (on NASA ADS)

First author papers




 9  317  229

1. **Murray, S. G.**, Diemer, B., Chen, Z. et. al. (2021), *THEHALOMOD: An online calculator for the halo model*, [A&C](#), **36**, 100487  5  58
2. **Murray, Steven**, Greig, Bradley, Mesinger, Andrei et. al. (2020), *21cmFAST v3: A Python-integrated C code for generating 3D realizations of the cosmic 21cm signal.*, [JOSS](#), **5**, 2582  15  24
3. **Murray, Steven**, Poulin, Francis (2019), *hankel: A Python library for performing simple and accurate Hankel transformations*, [JOSS](#), **4**, 1397  8  18
4. **Murray, Steven G.** (2018), *powerbox: A Python package for creating structured fields with isotropic power spectra*, [JOSS](#), **3**, 850  6  11
5. **Murray, Steven G.**, Trott, C. M. (2018), *The Effect of Baseline Layouts on the Epoch of Reionization Foreground Wedge: A Semianalytical Approach*, [ApJ](#), **869**, 25  4  3
6. **Murray, S. G.**, Robotham, A. S. G., Power, C. (2018), *An Empirical Mass Function Distribution*, [ApJ](#), **855**, 5  1  10

¹<https://ui.adsabs.harvard.edu/public-libraries/qfT0ZuGSRWCBI5sG0r15hw>





7. **Murray, S. G.**, Trott, C. M., Jordan, C. H. (2017), *An Improved Statistical Point-source Foreground Model for the Epoch of Reionization*, [ApJ](#), **845**, 7  19  4
8. **Murray, S. G.**, Power, C., Robotham, A. S. G. (2013), *HMFcalc: An online tool for calculating dark matter halo mass functions*, [A&C](#), **3**, 23  217  99
9. **Murray, S. G.**, Power, C., Robotham, A. S. G. (2013), *How well do we know the halo mass function ?*, [MNRAS](#), **434**, L61  42  2

Papers with significant contribution to analysis




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10. Prelogović, David, Mesinger, Andrei, **Murray, Steven** et. al. (2022), *Machine learning astrophysics from 21 cm lightcones: impact of network architectures and signal contamination*, [MNRAS](#), **509**, 3852  6  62
11. Aguirre, James E., **Murray, Steven G.**, Pascua, Robert et. al. (2022), *Validation of the HERA Phase I Epoch of Reionization 21 cm Power Spectrum Software Pipeline*, [ApJ](#), **924**, 85  4  54
12. Muñoz, Julian B., Qin, Yuxiang, Mesinger, Andrei et. al. (2022), *The Impact of the First Galaxies on Cosmic Dawn and Reionization*, [MNRAS](#),  6  0
13. The HERA Collaboration, Abdurashidova, Zara, Aguirre, James E. et. al. (2021), *First Results from HERA Phase I: Upper Limits on the Epoch of Reionization 21 cm Power Spectrum*, [arXiv e-prints](#), [arXiv:2108.02263](#)  21  144
14. Chen, Zhaoting, Wolz, Laura, Spinelli, Marta, **Murray, Steven G.** (2021), *Extracting H I astrophysics from interferometric intensity mapping*, [MNRAS](#), **502**, 5259  4  23
15. Nasirudin, A., **Murray, S. G.**, Trott, C. M. et. al. (2020), *The Impact of Realistic Foreground and Instrument Models on 21 cm Epoch of Reionization Experiments*, [ApJ](#), **893**, 118  6  14
16. Wolz, L., **Murray, S. G.**, Blake, C., Wyithe, J. S. (2019), *Intensity mapping cross-correlations II: HI halo models including shot noise*, [MNRAS](#), **484**, 1007  19  19
17. Trott, Cathryn M., Fu, Shih Ching, **Murray, S. G.** et. al. (2019), *Robust statistics towards detection of the 21 cm signal from the Epoch of Reionization*, [MNRAS](#), **486**, 5766  6  3
18. Trott, Cathryn M., Watkinson, Catherine A., Jordan, Christopher H. et. al. (2019), *Gridded and direct Epoch of Reionisation bispectrum estimates using the Murchison Widefield Array*, [PASA](#), **36**, e023  18  11
19. Trott, Cathryn M., Jordan, C. H., **Murray, S. G.** et. al. (2018), *Assessment of Ionospheric Activity Tolerances for Epoch of Reionization Science with the Murchison Widefield Array*, [ApJ](#), **867**, 15  15  17
20. Meyers, B. W., Tremblay, S. E., Bhat, N. D. R. et. al. (2018), *Hunting for Radio Emission from the Intermittent Pulsar J1107-5907 at Low Frequencies*, [ApJ](#), **869**, 134  11  15
21. Obreschkow, D., **Murray, S. G.**, Robotham, A. S. G., Westmeier, T. (2018), *Eddington's demon: inferring galaxy mass functions and other distributions from uncertain data*, [MNRAS](#), **474**, 5500  10  4
22. Jordan, C. H., **Murray, S.**, Trott, C. M. et. al. (2017), *Characterization of the ionosphere above the Murchison Radio Observatory using the Murchison Widefield Array*, [MNRAS](#), **471**, 3974  35  6
23. Avila, Santiago, **Murray, Steven G.**, Knebe, Alexander et. al. (2015), *HALO-GEN: a tool for fast generation of mock halo catalogues*, [MNRAS](#), **450**, 1856  42  8

24. Abdurashidova, Zara, Aguirre, James E., Alexander, Paul et. al. (2022), *First Results from HERA Phase I: Upper Limits on the Epoch of Reionization 21 cm Power Spectrum*, [ApJ](#), 925, 221  0  0
25. Abdurashidova, Zara, Aguirre, James E., Alexander, Paul et. al. (2022), *HERA Phase I Limits on the Cosmic 21 cm Signal: Constraints on Astrophysics and Cosmology during the Epoch of Reionization*, [ApJ](#), 924, 51  13  178
26. Mahesh, Nivedita, Bowman, Judd D., Mozdzen, Thomas J. et. al. (2021), *Validation of the EDGES Low-band Antenna Beam Model*, [The Astronomical Journal](#), 162, 38  5  53
27. Monsalve, Raul A., Rogers, Alan E. E., Bowman, Judd D. et. al. (2021), *Absolute Calibration of Diffuse Radio Surveys at 45 and 150 MHz*, [ApJ](#), 908, 145  5  19
28. Tan, Jianrong, Liu, Adrian, Kern, Nicholas S. et. al. (2021), *Methods of Error Estimation for Delay Power Spectra in 21 cm Cosmology*, [The Astrophysical Journal Supplement Series](#), 255, 26  4  56
29. Trott, C. M., Jordan, C. H., Line, J. L. B. et. al. (2021), *Constraining the 21 cm brightness temperature of the IGM at $z = 6.6$ around LAEs with the Murchison widefield array*, [MNRAS](#), 507, 772  0  47
30. Yoshiura, S., Pindor, B., Line, J. L. B. et. al. (2021), *A new MWA limit on the 21 cm power spectrum at redshifts 13-17*, [MNRAS](#), 505, 4775  8  48
31. Rahimi, M., Pindor, B., Line, J. L. B. et. al. (2021), *Epoch of reionization power spectrum limits from Murchison Widefield Array data targeted at EoR1 field*, [MNRAS](#), 508, 5954  4  116
32. La Plante, P., Williams, P. K. G., Kolopanis, M. et. al. (2021), *A Real Time Processing system for big data in astronomy: Applications to HERA*, [A&C](#), 36, 100489  1  51
33. Kern, Nicholas S., Dillon, Joshua S., Parsons, Aaron R. et. al. (2020), *Absolute Calibration Strategies for the Hydrogen Epoch of Reionization Array and Their Impact on the 21 cm Power Spectrum*, [ApJ](#), 890, 122  26  23
34. Kern, Nicholas S., Parsons, Aaron R., Dillon, Joshua S. et. al. (2020), *Mitigating Internal Instrument Coupling for 21 cm Cosmology. II. A Method Demonstration with the Hydrogen Epoch of Reionization Array*, [ApJ](#), 888, 70  27  20
35. Weltman, A., Bull, P., Camera, S. et. al. (2020), *Fundamental physics with the Square Kilometre Array*, [PASA](#), 37, e002  130  49
36. Dillon, Joshua S., Lee, Max, Ali, Zaki S. et. al. (2020), *Redundant-baseline calibration of the hydrogen epoch of reionization array*, [MNRAS](#), 499, 5840  19  23
37. Qin, Yuxiang, Poulin, Vivian, Mesinger, Andrei et. al. (2020), *Reionization inference from the CMB optical depth and E-mode polarization power spectra*, [MNRAS](#), 499, 550  17  23
38. Zhang, Zheng, Poher, Jonathan C., Li, Wenyang et. al. (2020), *The impact of tandem redundant/sky-based calibration in MWA Phase II data analysis*, [PASA](#), 37, e045  5  20
39. Li, W., Poher, J. C., Barry, N. et. al. (2019), *First Season MWA Phase II Epoch of Reionization Power Spectrum Results at Redshift 7*, [ApJ](#), 887, 141  49  41
40. Liu, Adrian, Aguirre, James, Ali-Haimoud, Yacine et. al. (2019), *Cosmology with the Highly Redshifted 21 cm Line*, [Bulletin of the American Astronomical Society](#), 51, 63  4  25

41. Li, W., Pober, J. C., Hazelton, B. J. et. al. (2018), *Comparing Redundant and Sky-model-based Interferometric Calibration: A First Look with Phase II of the MWA*, [ApJ](#), 863, 170  37  14
42. Chuang, Chia-Hsun, Zhao, Cheng, Prada, Francisco et. al. (2015), *nIFTy cosmology: Galaxy/halo mock catalogue comparison project on clustering statistics*, [MNRAS](#), 452, 686  70  9

Conference proceedings

 2  3  2

43. **Murray, S. G.**, Trott, C. M., Jordan, C. H. (2018), *A Clustered Extragalactic Foreground Model for the EoR*, [Peering towards Cosmic Dawn](#), 333, 199  3  2
44. **Murray, S. G.**, Power, C., Robotham, A. S. G. (2014), *Modelling Galaxy Populations in the Era of Big Data*, [Statistical Challenges in 21st Century Cosmology](#), 306, 304  0  0