

## Dr Ryan M. Shannon

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<b>Contact Information</b>	<p>Curtin University Institute for Radio Astronomy &amp; CSIRO Astronomy and Space Science Box 76 Epping, NSW 1710 Australia</p> <p><i>phone:</i> +61 (02) 9372 4326 <i>fax:</i> +61 (02) 9372 4310 <i>email:</i> Ryan.Shannon@csiro.au www.atnf.csiro.au/people/Ryan.Shannon</p>
<b>Research Interests</b>	<p>Observation and theoretical studies of neutron stars with a particular focus on:</p> <ul style="list-style-type: none"><li>- Observing the gravitational-wave universe with pulsars.</li><li>- Using pulsars to characterise their environments and the interstellar medium.</li><li>- Developing new instrumentation and techniques for pulsar observations.</li></ul>
<b>Education</b>	<p><b>Cornell University</b>, Ithaca, USA. Ph.D., Astronomy. 2011. Dissertation Title: <i>Pulsars and their Environments: The Interactions Between Pulsar Emission, Matter and Gravitational Waves</i>. Advisor: Professor Jim Cordes M.S., Astronomy, 2008.</p> <p><b>University of British Columbia</b>, Vancouver, Canada. B.Sc., combined honours in Physics &amp; Astronomy, May 2004. Graduated with first class honours with distinction. Honours Thesis Advisor: Professor Jeremy Heyl</p>
<b>Research Experience</b>	<p>RESEARCH FELLOW, CSIRO ASTRONOMY AND SPACE SCIENCE &amp; CURTIN UNIVERSITY 2015 - Present Low frequency observations of pulsars, precision pulsar timing, &amp; gravitational wave detection.</p> <p>PARKES INSTRUMENT SCIENTIST, CSIRO ASTRONOMY AND SPACE SCIENCE 2013 - 2015 Leader of CASS astrophysics group involvement in the Parkes telescope involvement.</p> <p>POSTDOCTORAL FELLOW IN GRAVITATIONAL-WAVE SCIENCE, CSIRO ASTRONOMY AND SPACE SCIENCE 2013 - 2015 Searching for gravitational waves in Parkes and International Pulsar Timing Array datasets and investigating their astrophysical implications.</p> <p>OCE POSTDOCTORAL FELLOW, CSIRO ASTRONOMY AND SPACE SCIENCE 2010 - 2013 Observations of radio pulsars with the primary goals of 1) Detecting gravitational radiation and 2) Understanding pulsar emission by connecting radio and high-energy emission.</p> <p>GRADUATE RESEARCH ASSISTANT, CORNELL UNIVERSITY 2004 - 2010 Observations of radio pulsars at radio, infrared, X-ray, and gamma-ray wavelengths. Pulsar phenomenology. Mentor: Professor Jim Cordes.</p> <p>UNDERGRADUATE RESEARCH ASSISTANT, UNIVERSITY OF BRITISH COLUMBIA 2003 - 2004 Modelling wave propagation through neutron star magnetospheres. Mentor: Professor Jeremy Heyl.</p> <p>NSERC UNDERGRADUATE SUMMER RESEARCH ASSISTANT, UNIVERSITÉ DE MONTRÉAL 2003 Modelling white dwarf atmospheres. Mentor: Professor Pierre Bergeron.</p> <p>NSERC UNDERGRADUATE SUMMER RESEARCH ASSISTANT, UNIVERSITY OF TORONTO 2002 Laser micromachining. Mentor: Professor Robin Marjoribanks.</p>
<b>Grants Awarded</b>	<p>THE VARIABILITY OF THE CRAB PULSAR: A JOINT RADIO GAMMA-RAY STUDY. Principal investigator of 500 hr of simultaneous observations at gamma-ray and radio wavelengths. NASA Guest Investigator Grant, \$59,700 to Ryan Shannon.</p> <p>SEARCHING FOR DEBRIS DISKS AROUND VARIABLE PULSARS. Principal investigator of 7 hours of observation using the mid-infrared camera IRAC on Spitzer Space Telescope. NASA Guest Investigator Grant, \$28,000 to Ryan Shannon.</p>

<b>Students Supervised</b>	M. Jones (2015, visiting graduate research assistant from West Virginia University). R. Spiewak (2014-2015, visiting research assistant from University of Wisconsin). C. Raithel (2013-2014, visiting research assistant from Carleton College, now Ph.D. candidate at the University of Arizona). A. Barbara (2013, keystone research student from Macquarie University). A. Chael (2011-2012, visiting research assistant from Carleton College, now Ph.D. candidate at Harvard University). J. Lopez (2012 ATNF/CASS summer vacation student, with G. Hobbs, now Ph.D. candidate at UNSW). E. Petroff (2011, visiting research assistant from Carleton College, now Ph.D. candidate at Swinburne University). R. Finnegan (2011, ATNF/CASS Summer Student)
<b>Teaching Experience</b>	<p>LECTURER 2015 INTERNATIONAL PULSAR TIMING ARRAY WINTER SCHOOL 2015 Delivered lectures and led practical exercises on pulsar timing to undergraduates students, post-graduate students, and postdoctoral fellows.</p> <p>LECTURER AND DEMONSTRATOR, PULSE@PARKES TOUR OF JAPAN 2013, 2014 Delivered lectures and led Pulse@Parkes observing session with students from Iwate, Fukushima, Sendai, Yamagata, and Tokyo Prefectures.</p> <p>LECTURER, 2014 CSIRO ASTRONOMY AND SPACE SCIENCE RADIO SCHOOL, NARRABRI, AUSTRALIA 2014 Delivered lecture on polarisation and polarimetry to Astronomy Ph.D. Students.</p> <p>PRESENTER, PULSE@PARKES, SYDNEY AND MELBOURNE, AUSTRALIA 2010 - Present Lectured and led data analysis modules for secondary school students as part of Pulse@Parkes observation programme.</p> <p>LECTURER, 2013 INTERNATIONAL PULSAR TIMING ARRAY MEETING STUDENT WORKSHOP, KRABI, THAILAND 2013 Delivered lectures and developed tutorial on noise analysis for undergraduate, Ph.D. students, and postdoctoral fellows.</p> <p>LECTURER, HARLEY WOOD WINTER SCHOOL WENTWORTH FALLS, AUSTRALIA 2012 Lectured on gravitational wave detection with pulsars to Ph.D. Students.</p> <p>ORGANISER, LECTURER, AND TUTORIAL LEADER, 2012 INTERNATIONAL PULSAR TIMING ARRAY STUDENT WORKSHOP, SYDNEY, AUSTRALIA 2012 Developed curriculum comprising lectures, data analysis modules, panel discussions, and observing masterclass for week-long workshop on pulsar timing for undergraduate, Ph.D. students, and postdoctoral fellows. Additionally, gave lecture Introduction to Pulsars.</p> <p>LECTURER, ASTRONOMY FROM THE GROUND UP WORKSHOP, PARKES AUSTRALIA 2012 Lectured on stellar evolution and exoplanets to primary and secondary school teachers.</p> <p>TUTORIAL INSTRUCTOR AND LECTURER, PARKES RADIO SCHOOL, PARKES, AUSTRALIA 2011 Lectured on pulsar observation and developed and lead a tutorial on pulsar searching to astronomy Ph.D. students.</p> <p>LECTURER AND INSTRUCTOR, IPTA 2011 SUMMER SCHOOL, MORGANTOWN, USA 2011 Delivered lecture and assisted in practica for audience of undergraduate students, graduate students, and postdoctoral fellows.</p> <p>LECTURER, ASTRONOMY FROM THE GROUND UP WORKSHOP, PARKES, AUSTRALIA 2011 Lecturer on stellar evolution to for primary and secondary school teachers.</p> <p>GUEST LECTURER, CORNELL UNIVERSITY AND WELLS COLLEGE 2004 - 2010 Substitute lecturer for undergraduate physics and astronomy courses.</p> <p>PARTICIPANT, EDUCATION 647, CORNELL UNIVERSITY 2007 Course subject: Teaching science in the college setting. COURSE PAPER TOPIC: Using remote telescopes in the undergraduate astronomy classroom.</p> <p>TEACHING ASSISTANT, CORNELL UNIVERSITY 2005 - 2006 Section instructor for introductory astronomy and planetary sciences courses.</p> <p>PARTICIPANT, WRITING 701, CORNELL UNIVERSITY 2006 Course subject: Teaching technical subjects through writing exercises.</p> <p>TEACHING ASSISTANT, UNIVERSITY OF BRITISH COLUMBIA 2004 Laboratory instructor for introductory physics for students majoring in the sciences.</p>
<b>Professional Service</b>	<i>Chair, Scientific Organising Committee</i> International Pulsar Timing Array 2015 Meeting. <i>Member</i> International Pulsar Timing Array Steering Committee (2014-2015). <i>Member</i> Australia Telescope

Users' Committee (2011-2014), ATNF Time Allocation Committee (2015-present). *Member, Scientific Organising Committee*, 2014 International Pulsar Timing Array Meeting. *Co-chair, Pulsar Timing Session*, 2013 Amaldi Meeting on Gravitational Waves. *Co-chair, Local Organising Committee*, 2012 International Pulsar Timing Array Conference and Student Workshop. *Organiser* 2012 PPTA retreat. *Organiser* CASS/ATNF Colloquium Series (2011-2013). *Referee* The Astrophysical Journal (2012-present), MNRAS (2012-present), Classical and Quantum Gravity (2013-present).

## Honours and Awards

CSIRO John Philip Award for excellence in early career research (incl. \$A15,000 travel grant) 2014  
 CSIRO non-cash Award (for organisation of the 2012 IPTA meetings). 2012  
 USNC-URSI Travel Grant. 2010  
 Outstanding Poster, IAU General Assembly, Session: *Magnetic Fields in Diffuse Media*. 2009  
 Cornell University Graduate School Travel Grant. 2008, 2009  
 International Astronomical Union Travel Grant. 2009  
 American Astronomical Society Travel Grant. 2009  
 Chambliss Award (Honorable Mention), American Astronomical Society. 2007  
 Olin Fellow, Cornell University. 2007  
 Postgraduate Scholarship, NSERC Canada (declined). 2004  
 Departmental Research Fellowship, University of British Columbia. 2004  
 Science Scholar, University of British Columbia. 1999 - 2004  
 Dean's Honours List, University of British Columbia. 1999 - 2004  
 Undergraduate Summer Scholar, NSERC Canada. 2002, 2003  
 Undergraduate Scholar, University of British Columbia. 1999 - 2004  
 Volkoff Scholarship, University of British Columbia. 2001  
 Academic Cup, Southern Okanagan Secondary School. 1999

## In the Media

**R. Shannon** SCHOOL STUDENTS TAKE CONTROL OF ONE OF AUSTRALIA'S LARGEST DISHES. 2014. *ABC Evening News*, ABC (Australia) Television.  
**R. Shannon** INTERVIEW WITH PARKES OBSERVER 2014. *The Party Show*, RRR (Melbourne Public Radio).  
**R. Shannon** WHEN AN ASTEROID COLLIDES WITH A PULSAR. 2014. *Science Friday*, National Public Radio.  
 V. Ravi & **R. Shannon**. 2013 WHEN GALAXIES COLLIDE: THE GROWTH OF SUPERMASSIVE BLACK HOLES. *The Conversation*.  
**R. Shannon**. 2013. RECENT HIGHLIGHTS FROM THE PARKES PULSAR TIMING ARRAY PROJECT. *Australia Telescope National Facility Annual Report*.

## Refereed Publications: First author or key contributing co-author

(\*) indicates a student publication completed under my direct supervision.  
**R. M. Shannon** & 5 co-authors. 2016. CHARACTERISING THE ROTATIONAL IRREGULARITIES OF THE VELA PULSAR FROM 21 YR OF PHASE-COHERENT TIMING. *MNRAS*, accepted.  
 G. Hobbs & 76 co-authors including **R. M. Shannon**. 2016. A PILOT ASKAP SURVEY OF RADIO TRANSIENT EVENTS IN THE REGION AROUND THE INTERMITTENT PULSAR PSR J1107–5907. *MNRAS*, **456**, 3948. arXiv:1512.02702.  
 J. M. Cordes, **R. M. Shannon**, & D. R. Stinebring. 2016. FREQUENCY-DEPENDENT DISPERSION MEASURES AND IMPLICATIONS FOR PULSAR TIMING. *Ap.J.*, **817**, 16. arXiv:1503.08491  
 D. R. Madison & 25 co-authors including **R. M. Shannon**. 2016. VERSATILE DIRECTIONAL SEARCHES FOR GRAVITATIONAL WAVES WITH PULSAR TIMING ARRAYS, *MNRAS*, **455**, 3662. arXiv:1510.08068.  
 L. Lentati, **R. M. Shannon**, & 87 co-authors. 2016. FROM SPIN-NOISE TO SYSTEMATICS: STOCHASTIC PROCESSES IN THE FIRST INTERNATIONAL PULSAR TIMING ARRAY DATA RELEASE. *MNRAS*, **458**, 2161.  
**R. M. Shannon** & J. M. Cordes. CORRECTING FOR INTERSTELLAR PROPAGATION IN PRECISION TIMING OBSERVATIONS. *MNRAS*, submitted.  
 M. Kerr, & 3 co-authors including **R. M. Shannon**. 2016. PERIODIC MODULATION IN PULSE ARRIVAL TIMES FROM YOUNG PULSARS: A RENEWED CASE FOR NEUTRON STAR PRECESSION. *MNRAS*, **455**, 1845. arXiv:1510.06078  
 L. Lentati & **R. M. Shannon**. PROFILE STOCHASTICITY IN PSR J1909–3744. 2015. *MNRAS*, **454**, 1058. arXiv:1509.07505.

- W. A. Coles, M. Kerr, **R. M. Shannon**, & 18 co-authors. 2015. PULSAR OBSERVATIONS OF EXTREME SCATTERING EVENTS. *Ap.J.*, **808**, 313. arXiv:1506.07948.
- M. Kerr & 3 co-authors including **R. M. Shannon**. 2015. LIMITS ON PLANET FORMATION AROUND YOUNG PULSARS AND IMPLICATIONS FOR SUPERNOVA FALLBACK DISKS. *Ap.J.L.*, **809**, 11.
- R. M. Shannon** & 21 co-authors. 2015. GRAVITATIONAL WAVES FROM BINARY SUPERMASSIVE BLACK HOLES MISSING IN PULSAR OBSERVATIONS. *Science*, **349**, 1522. arXiv:1509.07320.
- \*C. A. Raithel, **R. M. Shannon**, & 2 co-authors. 2015. TWO EMISSION MECHANISMS IN PSR J0901–4624. *Ap.J.L.*, **804**, L18. arXiv:1503.04490
- S. Dai & 25 co-authors including **R. M. Shannon**. A STUDY OF THE MULTI-FREQUENCY POLARIZATION PULSE PROFILES OF MILLISECOND PULSARS. *MNRAS*, **449**, 3223. arXiv:1503.01841
- \*V. Ravi, **R. M. Shannon**, & A. Jameson. 2015. A FAST RADIO BURST FROM THE DIRECTION OF THE CARINA DWARF SPHEROIDAL GALAXY. *Ap.J.L.*, **799**, 5. arXiv:1412.1599
- V. Ravi, J. S. B. Wyithe, **R. M. Shannon**, & G. Hobbs. 2014. PROSPECTS FOR GRAVITATIONAL-WAVE DETECTION AND SUPERMASSIVE BLACK HOLE ASTROPHYSICS WITH PULSAR TIMING ARRAYS. 2015. *MNRAS*, **447**, 2772. arXiv:1406.5927.
- M. Kerr, G. Hobbs, **R. M. Shannon** & 2 co-authors. 2014. A FOUR-STATE SOLUTION THE THE INTERMITTENT PULSAR J1717–4054. *MNRAS*, **445**, 320.
- G. Hobbs & 5 co-authors including **R. M. Shannon**. 2014. THE ROLE OF FAST IN PULSAR TIMING ARRAY SCIENCE. *Research in Astronomy and Astrophysics*, submitted. arXiv:1407.0435
- R. M. Shannon** & 19 co-authors. 2014. SUMMARY OF SESSION C1: PULSAR TIMING ARRAYS. *General Relativity & Gravitation*. **46**, 8.
- J. B. Wang, G. Hobbs, W. A. Coles, **R. M. Shannon** & 14 co-authors. 2015. SEARCHING FOR GRAVITATIONAL-WAVE MEMORY IN THE PARKES PULSAR TIMING ARRAY DATASET. *MNRAS*, **446**, 1657. arXiv:1410.3323
- R. M. Shannon** & 19 co-authors. 2014. LIMITATIONS IN TIMING PRECISION DUE TO SINGLE-PULSE SHAPE VARIABILITY IN MILLISECOND PULSARS. *MNRAS*, **443**, 1463. arXiv:1406.4715.
- X.-J. Zhu & 19 co-authors including **R. M. Shannon**. LIMITS ON CONTINUOUS GRAVITATIONAL-WAVE SIGNALS IN THE PARKES PULSAR TIMING ARRAY DATASET. 2014. *MNRAS*, **444**, 3709. arXiv:1408.5129
- V. Ravi, J. S. B. Wyithe, **R. M. Shannon**, & 2 co-authors. 2014. BINARY SUPER-MASSIVE BLACK HOLE ENVIRONMENTS DIMINISH THE GRAVITATIONAL-WAVE SIGNAL IN THE PULSAR TIMING BAND. *MNRAS*, **442**, 46. arXiv:1404.5183.
- R. M. Shannon**, S. Johnston, & R. N. Manchester. THE KINEMATICS AND ORBITAL DYNAMICS OF THE PSR B1259–63/LS 2883 SYSTEM FROM 23 YEARS OF PULSAR TIMING. 2014. **437**, 3255. *MNRAS*. arXiv:1311.0588
- R. M. Shannon** & 16 co-authors. GRAVITATIONAL-WAVE LIMITS FROM PULSAR TIMING CONSTRAINT SUPERMASSIVE BLACK HOLE EVOLUTION. 2013. *Science*, **342**, 344. arXiv:1310.4569.
- R. M. Shannon** & S. Johnston. RADIO PROPERTIES OF THE MAGNETAR NEAR SAGITTARIUS A\* FROM OBSERVATIONS WITH THE AUSTRALIA TELESCOPE COMPACT ARRAY. 2013. *MNRAS Letters*, **435**, 29. arXiv:1305.3036.
- M. J. Keith, **R. M. Shannon**, & S. Johnston. A CONNECTION BETWEEN RADIO STATE CHANGING AND GLITCH ACTIVITY IN PSR J0742–2822. 2013. *MNRAS*, **432**, 3080. arXiv:1304.4644.
- M. J. Keith, W. Coles, **R. M. Shannon**, & 16 co-authors. MEASUREMENT AND CORRECTION OF VARIATIONS IN INTERSTELLAR DISPERSION IN HIGH-PRECISION PULSAR TIMING. 2013. *MNRAS*, **429**, 2161. arXiv:1211.5887.
- R. M. Shannon** & 9 co-authors. 2013. AN ASTEROID BELT INTERPRETATION FOR THE TIMING VARIATIONS OF MSP B1937+21. *Ap.J.* **766**, 5. arXiv:1301.6429.
- R. N. Manchester, G. Hobbs, M. Bailes, W. van Straten, M. J. Keith, **R. M. Shannon**, & 21 co-authors. 2013. THE PARKES PULSAR TIMING ARRAY PROJECT. *PASA*, **30**, 17. arXiv:1210.6103.
- R. M. Shannon** & J. M. Cordes. 2012. PULSE SHAPE CHANGES AND THE TIMING STABILITY OF MILLISECOND PULSARS: A CASE STUDY OF PSR J1713+0747. *Ap.J.*, **761**, 64.
- V. Ravi, J. S. B. Wyithe, G. Hobbs, **R. M. Shannon**, & 3 co-authors. 2012. DOES A STOCHASTIC BACKGROUND OF GRAVITATIONAL WAVES EXIST IN THE PULSAR TIMING BAND?. *Ap.J.*, **761**, 84. arXiv:1210.3854.
- G. Hobbs, R. N. Manchester, M. J. Keith, **R. M. Shannon**, & 23 co-authors. 2012. DEVELOPMENT

OF A PULSAR-BASED TIMESCALE. *MNRAS*, **427**, 2780. arXiv:1208.3560.

J. M. Cordes & **R. M. Shannon**. 2012. MINIMUM REQUIREMENTS FOR DETECTING GRAVITATIONAL WAVES WITH PULSARS. *Ap.J.*, **750**, 89. arXiv:1106.4047.

M. Lemoine-Goumard & 23 co-authors including **R. Shannon**. 2011. DISCOVERY OF GAMMA AND X-RAY PULSATIONS FROM THE YOUNG AND ENERGETIC PSR J1357-6429 WITH FERMI AND XMM-NEWTON. *A&A*. **533**, 102. arXiv:1108.0161.

J. M. Cordes & **R. M. Shannon**. 2010. A MEASUREMENT MODEL FOR THE PRECISION TIMING OF MILLISECOND PULSARS. arXiv:1010.3785.

**R. M. Shannon** & J. M. Cordes. 2010. ASSESSING THE ROLE OF SPIN NOISE IN PRECISION PULSAR TIMING. *Ap.J.* **725**, 1607. arXiv:1010.4794

J. M. Cordes & **R. M. Shannon**. 2008. ROCKING THE LIGHTHOUSE: CIRCUMPULSAR ASTEROIDS AND RADIO INTERMITTENCY. *Ap.J.* **682**, 1152.

**R. M. Shannon** & J. S. Heyl. 2006. MAGNETOSPHERIC BIREFRINGENCE INDUCES POLARIZATION SIGNATURES IN NEUTRON STAR SPECTRA. *MNRAS*. **368**, 1377.

#### Other refereed publications

D. Schnitzeler and 6 co-authors including **R. M. Shannon**. 2016. RADIO POLARIMETRY OF GALACTIC CENTRE PULSARS. *MNRAS*, accepted

P. D. Lasky & 25 co-authors including **R. M. Shannon**. 2016. GRAVITATIONAL-WAVE COSMOLOGY ACROSS 29 DECADES IN FREQUENCY. *PRX*, **6**, 011035.

J. Verbiest & 91 co-authors including **R. M. Shannon**. 2016. THE INTERNATIONAL PULSAR TIMING ARRAY: FIRST DATA RELEASE, *MNRAS*, **458**, 1267. arXiv:1602.03640.

M. Kerr & 4 co-authors including **R. M. Shannon** TIMING GAMMA-RAY PULSARS WITH THE FERMI LARGE AREA TELESCOPE: TIMING NOISE AND ASTROMETRY, *Ap.J.*, **814**, 128. arXiv:1510.05099.

P. Brook & 4 co-authors including **R. M. Shannon**. EMISSION-ROTATION CORRELATION IN PULSARS: NEW DISCOVERIES WITH OPTIMAL TECHNIQUES, *MNRAS*, **456**, 1374. arXiv:1511.05481.

C. Tiburzi & 8 co-authors including **R. M. Shannon**. 2016. A STUDY OF SPATIAL CORRELATIONS IN PULSAR TIMING ARRAY DATA. *MNRAS*, **455**, 4339. arXiv:1510.02363.

X.-J. Zhu & 5 co-authors including **R. M. Shannon**. DETECTING NANOHERTZ GRAVITATIONAL WAVES WITH PULSAR TIMING ARRAYS. *Science China: Physics, Mechanics, & Astronomy*, submitted. arXiv:1509.06438.

D. Reardon & 20 co-authors including **R. M. Shannon**. TIMING ANALYSIS OF 20 MILLISECOND PULSARS IN THE PARKES PULSAR TIMING ARRAY. *MNRAS*, **455**, 1751. arXiv:1510.04334.

A. Karastergiou & 10 co-authors including **R. M. Shannon** UNDERSTANDING PULSAR MAGNETOSPHERES WITH THE SKA. 2015. *Proc. Sci.*, in press. arXiv:1501.00126.

D. Antonopoulou & 6 co-authors including **R. M. Shannon**. THE UNUSUAL GLITCH RECOVERIES OF THE HIGH MAGNETIC FIELD PULSAR J1119–6127. 2015. *MNRAS*, **447**, 3924. arXiv:1412.5853.

T. Dolch & 41 co-authors including **R. M. Shannon**. A 24-HOUR GLOBAL CAMPAIGN TO ASSESS PRECISION TIMING OF THE MILLISECOND PULSAR J1713+0747. 2014. *Ap.J.*, **794**, 21. arXiv:1408.1694.

X. Hou & 13 co-authors including **R. Shannon**. SIX FAINT GAMMA-RAY PULSARS SEEN WITH THE FERMI LARGE AREA TELESCOPE. 2014. *A&A*, **570** 44. arXiv:1407.6271.

C. Ng & 23 co-authors including **R. M. Shannon**. THE HIGH TIME RESOLUTION UNIVERSE PULSAR SURVEY X: DISCOVERY OF FOUR MILLISECOND PULSARS AND UPDATED TIMING SOLUTIONS OF A FURTHER 12. 2014 *MNRAS*, **439**, 1865. arXiv:1401.3003.

P. Brook & 7 co-authors including **R. M. Shannon**. 2014. EVIDENCE OF AN ASTEROID ENCOUNTERING A PULSAR. *Ap.J.L.*, **780**, 31. arXiv:1311.3541.

L. Lentati & 6 co-authors including **R. M. Shannon**. 2014. TEMPO-NEST: A BAYESIAN APPROACH TO PULSAR TIMING ANALYSIS. *MNRAS*, **440**, 5183. arXiv:1310.2120.

T. J. Johnson & 29 co-authors including **R. M. Shannon**. 2013. BROADBAND PULSATIONS FROM PSR B1821-24: IMPLICATIONS FOR EMISSION MODELS AND THE PULSAR POPULATION OF M28. *Ap.J.* accepted. arXiv:1310.1852.

X. P. Deng & 12 co-authors including **R. M. Shannon**. 2013. INTERPLANETARY SPACECRAFT NAVIGATION USING PULSARS. *Advances in Space Research*. **52**, 1602. arXiv:1307.5375.

E. Petroff, M. J. Keith, S. Johnston, W. van Straten, & **R. M. Shannon**. 2013. DISPERSION MEASURE VARIATIONS IN A SAMPLE OF 168 PULSARS. *MNRAS*. **435**, 1610. arXiv:1307.7221.

- A. A. Abdo, & 213 co-authors including **R. M. Shannon**. 2013 THE SECOND FERMI LARGE AREA TELESCOPE CATALOG OF GAMMA-RAY PULSARS. *Ap.J.S.* **208**, 17. arXiv:1305.4385.
- C. M. Espinoza & 26 co-authors including **R. M. Shannon**. 2013. NEW MILLISECOND PULSAR DETECTED BY THE FERMI LARGE AREA TELESCOPE AND THE RADIO/GAMMA-RAY CONNECTION. *MNRAS*, **430**, 531. arXiv:1212.4360.
- M. Yu & 11 co-authors including **R. M. Shannon**. 2013. DETECTION OF 107 GLITCHES IN 36 SOUTHERN PULSARS. *MNRAS*, **427**, 688. arXiv:1211.2035
- The NANOGrav Collaboration including **R. M. Shannon**. 2013. LIMITS ON THE STOCHASTIC GRAVITATIONAL WAVE BACKGROUND FROM THE NORTH AMERICAN NANOHERTZ OBSERVATORY FOR GRAVITATIONAL WAVES. *Ap.J.*, **76**, 94. arXiv:1201.6641.
- B. Posselt & 6 co-authors including **R. M. Shannon**. 2012. XMM-NEWTON OBSERVATIONS OF THE VERY OLD PULSAR J0108-1431. *Ap.J.*, **761**, 117. arXiv:1210.7179.
- C. Y Ng & 7 co-authors including **R. M. Shannon**. DEEP X-RAY OBSERVATIONS OF THE YOUNG HIGH- MAGNETIC FIELD PULSAR J1119-6127 AND SUPERNOVA REMMANT G292.2-0.5. *Ap.J.*, **761** 65. arXiv:1211.2761
- X. P. Deng & 6 co-authors including **R. M. Shannon**. 2012. OPTIMAL INTERPOLATION AND PREDICTION IN PULSAR TIMING. *MNRAS*, **424**, 244. arXiv:1204.6111.
- L. Guillemot & 27 co-authors including **R. Shannon**. 2012. PULSED GAMMA RAYS FROM THE ORIGINAL MILLISECOND AND BLACK WIDOW PULSARS: A CASE FOR CAUSTIC RADIO EMISSION? *Ap.J.*, **744**, 33. arXiv:1110.1271.
- The Fermi LAT Collaboration including **R. Shannon**. 2011. FERMI DETECTION OF A LUMINOUS  $\gamma$ -RAY PULSAR IN A GLOBULAR CLUSTER. *Science*, **334**, 1107. arXiv:1111.3754.
- A. Abdo & 172 co-authors including **R. Shannon**. 2011. DISCOVERY OF HIGH-ENERGY GAMMA-RAY EMISSION FROM THE BINARY SYSTEM PSR B1259-63/LS 2883 AROUND PERIASTRON WITH FERMI. *Ap.J.L.*, **736**, L11. arXiv:1103.4108.
- G. Hobbs & 57 co-authors including **R. Shannon**. 2010. THE INTERNATIONAL PULSAR TIMING ARRAY PROJECT: USING PULSARS AS A GRAVITATIONAL WAVE DETECTOR. *Classical & Quantum Grav.* **27**, 084013. arXiv:0911.5206.

## Colloquia and Conference Presentations

- PULSAR SCIENCE IN THE ERA OF FAST: PULSAR TIMING ARRAYS AND GRAVITATIONAL-WAVE DETECTION. Contributed presentation, First ACAMAR symposium, Perth, Australia, 2016.
- UNDERSTANDING THE EPHEMERAL UNIVERSE: OPPORTUNITIES AND CHALLENGES IN THE AGE OF BIG DATA. Invited Presentation, Computational Science and E-research conference, Melbourne, Australia, 2016.
- FAST RADIO BURSTS AND THE MAGNETIZATION AND TURBULENCE OF THE COSMIC WEB. Curtin Institute for Radio Astronomy Seminar, Curtin University, Perth, Australia, 2016.
- PULSAR TIMING: THE GOOD THE BAD AND THE UGLY. Bolton Symposium, Sydney Australia, 2016.
- COSMOLOGICAL APPLICATIONS OF PULSARS. Physics Seminar, University of Western Australia, Perth, Australia, 2015
- GRAVITATIONAL WAVES AND TIME STANDARDS USING OBSERVATIONS OF MILLISECOND PULSARS. Invited Presentation, IAU General Assembly, Honolulu, USA, 2015.
- CONSTRAINTS ON THE FORMATION OF GALAXIES USING PULSAR TIMING ARRAYS. Invited Presentation, IAU General Assembly, Honolulu, USA, 2015.
- IDEAS FOR A SECOND IPTA DATA RELEASE. Contributed presentation, 2015 IPTA Meeting, Leura, NSW, 2015.
- PULSARS. Invited Presentation, Astronomical Meeting of Australia, Fremantle, Australia, 2015.
- STUDYING THE CENTERS OF GALAXIES WITH GRAVITATIONAL WAVES AND PULSAR TIMING ARRAYS. Invited Plenary Presentation, Amaldi Meeting on Gravitational Waves, Korea, 2015.
- COSMOLOGICAL APPLICATIONS OF PULSARS. KIAA Astronomy Lunch, Peking University, Beijing, China, 2015
- COSMOLOGICAL APPLICATIONS OF PULSARS. Astrophysics Lunch, Cornell University, Ithaca, USA, 2015
- WHAT'S NEW WITH THE PPTA? Contributed Oral Presentation, Orange Pulsar Meeting. Melbourne, Australia, 2014
- PULSAR SCIENCE WITH THE EXTENDED MWA. Contributed Oral Presentation, MWA Science Meet-

ing. Sydney, Australia, 2014

CONSTRAINING THE SUPERMASSIVE BLACK HOLE POPULATION WITH GRAVITATIONAL WAVES AND PULSAR TIMING ARRAYS. Contributed Oral Presentation, Annual Meeting of the Astronomical Society of Australia. Sydney, Australia, 2014

SEARCHING FOR BURSTS OF GRAVITATIONAL WAVES IN PULSAR TIMING ARRAY DATASETS.

Invited oral presentation, 2014 LIGO/IPTA Detection Workshop Meeting. Banff, Canada, 2014.

NOISE PROPERTIES OF PPTA PULSARS.

Invited oral presentation, 2014 IPTA Meeting. Banff, Canada, 2014.

ASTROPHYSICAL IMPLICATIONS OF PULSAR TIMING ARRAY OBSERVATIONS.

Invited oral presentation, 2014 Gravitational Wave Advanced Detect Workshop. Takayama, Japan, 2014.

PULSAR TIMING ARRAYS FOR GRAVITATIONAL WAVE DETECTION.

Invited plenary presentation, Seventh Australasian Conference on General Relativity and Gravitation. Hamilton Island, Australia, 2013.

THE KINEMATICS AND ORBITAL DYNAMICS OF THE PSR B1259–63/LS 2883 SYSTEM.

Oral Presentation, Bolton Symposium, Sydney, Australia, 2013.

GRAVITATIONAL WAVE LIMITS FROM PULSAR TIMING CONSTRAIN THE GROWTH OF MASSIVE BLACK HOLES.

Poster presentation, 2013 Amaldi Meeting. Warsaw, Poland, 2013.

GRAVITATIONAL WAVE LIMITS FROM PULSAR TIMING CONSTRAIN THE GROWTH OF MASSIVE BLACK HOLES: APPLICATIONS TO THE PPTA AND IPTA DATASETS.

Invited Oral Presentation, IPTA 2013 Science Meeting, Krabi, Thailand, 2013.

GRAVITATIONAL WAVE LIMITS FROM PULSAR TIMING CONSTRAIN THE GROWTH OF MASSIVE BLACK HOLES.

Invited Colloquium, Yamagata University Astronomy Department, Yamagata, Japan, 2013.

GRAVITATIONAL WAVE LIMITS FROM PULSAR TIMING CONSTRAIN THE GROWTH OF MASSIVE BLACK HOLES.

Invited Colloquium, JAXA, Sagami-hara, Japan, 2013.

GRAVITATIONAL WAVE LIMITS FROM PULSAR TIMING CONSTRAIN THE GROWTH OF MASSIVE BLACK HOLES.

Invited Colloquium, NICT Kashima, Kashima, Japan, 2013.

GRAVITATIONAL WAVE LIMITS FROM PULSAR TIMING CONSTRAIN THE GROWTH OF MASSIVE BLACK HOLES.

Invited Colloquium, NAOJ Misuzawa Observatory, Misuzawa, Japan, 2013.

CONSTRAINING THE SUPERMASSIVE BLACK HOLE POPULATION WITH GRAVITATIONAL WAVES AND PULSAR TIMING ARRAYS.

Invited Colloquium, Caltech Tea Talk Series, Pasadena, USA, 2013.

GRAVITATIONAL WAVE LIMITS FROM PULSAR TIMING CONSTRAIN THE GROWTH OF MASSIVE BLACK HOLES.

Invited Colloquium, Caltech Astrophysics Tea Talk Series, Pasadena, USA, 2013.

PARKES PULSAR TIMING ARRAY: OVERVIEW AND CURRENT LIMIT.

Invited Oral Presentation, Physical Applications of Millisecond Pulsars, Aspen, USA, 2013.

GRAVITATIONAL WAVE LIMITS FROM PULSAR TIMING CONSTRAIN THE GROWTH OF MASSIVE BLACK HOLES.

Oral Presentation, Bolton Symposium, Sydney, Australia, 2012.

ASSESSING THE INSTABILITY OF A CELEBRITY MILLISECOND PULSAR.

Invited Colloquium, Astrophysics Group, University of Melbourne, 2012.

CONSTRAINING THE GRAVITATIONAL WAVE BACKGROUND WITH THE PARKES PULSAR TIMING ARRAY.

Contributed Oral Presentation, IAU Symposium 291: Neutron Stars and Pulsars: Challenges and Opportunities after 80 years. Beijing, China. 2012.

A NEW ALGORITHM FOR CONSTRAINING THE STRENGTH OF THE GRAVITATIONAL WAVE BACKGROUND: APPLICATIONS TO THE IPTA DATA CHALLENGE AND THE PARKES PULSAR TIMING ARRAY.

Invited Oral Presentation, 2012 International Pulsar Timing Array Meeting, Kiama, Australia. 2012.

PULSE SHAPE CHANGES AND THE INTRINSIC STABILITY OF MILLISECOND PULSARS: A CASE

STUDY OF PSR J1713+0747.

Oral Presentation, 2012 International Pulsar Timing Array Meeting, Kiama, Australia. 2012.

A BOUND ON THE GRAVITATIONAL WAVE BACKGROUND WITH THE PARKES PULSAR TIMING ARRAY.

Oral Presentation, Orange Pulsar Meeting, Melbourne, Australia. 2012.

CONSTRAINING THE GRAVITATIONAL WAVE BACKGROUND WITH THE PARKES PULSAR TIMING ARRAY.

Oral Presentation, Bolton Symposium, Sydney , Australia. 2011.

DETECTING GRAVITATIONAL WAVES WITH PULSARS.

Invited Colloquium, Curtin Institute for Radio Astronomy, Perth, Australia. 2011.

THE LONG-TERM TIMING OF PSR B1259–63.

Oral Presentation, Parkes 50th Anniversary Symposium, Parkes, Australia. 2011.

PLANETARY SYSTEMS AROUND PULSARS.

Invited Oral Presentation, CASS Science Review, Sydney, Australia. 2011.

FINE TUNING PULSAR TIMING: A CASE STUDY OF A CELEBRITY MILLISECOND PULSAR.

Invited Colloquium, CSIRO Astronomy and Space Science, Sydney, Australia. 2011.

ASTEROIDS AROUND PULSARS: EVIDENCE FROM A MILLISECOND PULSAR.

Poster Presentation, Annual Meeting of the Astronomical Society of Australia. Adelaide, Australia. 2011.

A DATA ANALYSIS UPDATE FROM THE PARKES PULSAR TIMING ARRAY.

Invited Oral Presentation at International Pulsar Timing Array Conference, Snowshoe, USA. 2011.

CORRECTING FOR THE INTERSTELLAR MEDIUM IN PRECISION PULSAR TIMING OBSERVATIONS.

Oral Presentation at Fab Five Fest Conference, Arecibo, Puerto Rico. 2011.

OPTIMIZING A PULSAR TIMING ARRAY.

Poster Presentation at 217th Meeting of the AAS, Seattle, USA, 2011.

BUILDING A GALACTIC-SCALE GRAVITATIONAL WAVE OBSERVATORY.

Invited Colloquium, Astronomy Department, Cornell University, Ithaca, USA. 2010.

MITIGATING PROPAGATION EFFECTS IN PULSAR TIMING OBSERVATIONS.

Oral Presentation at International Pulsar Timing Array Meeting, Leiden, the Netherlands. 2010.

IMPROVED METHODOLOGY FOR DETECTING GRAVITATIONAL WAVES WITH PULSARS.

Oral Presentation at USNC-URSI Meeting, Boulder, USA. 2010.

A NEW METHOD FOR DETECTING GRAVITATIONAL WAVES WITH PULSARS.

Poster Presentation at IAU General Assembly, Rio de Janeiro, Brazil. 2009.

USING PULSARS TO STUDY THE SMALL-SCALE STRUCTURE OF THE INTERSTELLAR MEDIUM.

Poster Presentation at IAU General Assembly, Rio de Janeiro, Brazil. 2009.

A SEARCH FOR DEBRIS DISKS AROUND VARIABLE PULSARS.

Poster Presentation at 213th Meeting of the AAS. Long Beach, USA. 2009.

PRECISION INTERSTELLAR INTERFEROMETRY: TOWARDS FUTURE TELESCOPES.

Poster Presentation IAU General Assembly, Chicago, USA. 2008.

QUANTIFYING AND MITIGATING PROPAGATION EFFECTS IN PULSAR TIMING ARRAYS.

Oral and Poster Presentations at World Pulsar Timing Array Meeting, Arecibo, Puerto Rico. 2008.

MAPPING PULSAR MAGNETOSPHERES USING INTERSTELLAR SCINTILLATION.

Poster Presentation at Low Frequency Pulsar Science, Leiden, the Netherlands. 2008.

RESOLVING PULSAR MAGNETOSPHERES USING INTERSTELLAR INTERFEROMETRY.

Poster Presentation at 211th Meeting of the AAS. Austin, USA. 2008.

CIRCUMPULSAR ASTEROIDS AND RADIO INTERMITTENCY.

Invited Oral Presentation at Neutron Star Populations Workshop, Green Bank, USA. 2007.

CIRCUMPULSAR ASTEROIDS: INFERENCES FROM NULLING STATISTICS.

Poster Presentation at 209th Meeting of the AAS, Seattle, USA. 2007.