Report from the event supported by RadioNet

TITLE	*IAU SYMPOSIUM 337: PULSAR ASTROPHYSICS: THE NEXT FIFTY YEARS*
DATE:	*4-8 SEPTEMBER 2017*
LOCATION:	*JODRELL BANK OBSERVATORY, UNITED KINGDOM*
MEETING WEBPAGE:	*http://pulsarastronomy.net/iaus337/*
HOST INSTITUTE:	*JODRELL BANK CENTRE FOR ASTROPHYSICS, THE UNIVERSITY OF MANCHESTER*
RADIONET BENEFICIARY / NO:	*UMAN / 6*

CONTENT

RadioNet has received funding from the EU's Horizon 2020 research and innovation programme under the grant agreement No 730562

Report:

1 SCIENTIFIC SUMMARY

The scientific presentations at the symposium were an excellent summary of the achievements of the past 50 years of pulsar research combined with an exciting glimpse forward to what lies ahead for the next couple of decades. The meeting was organised around the broad topics of: Pulsar Searches, Binary Pulsars, Emission Physics, Multi-wavelength Studies, Gravity Tests and Gravitational Waves, New and Future Facilities, Neutron Star Masses and Equations of State, Pulsars and their environments and the Interstellar Medium.

In the pulsar searching session we heard about how the serendipitous discovery of pulsars was enabled by advances in instrumentation and tenacity and how that first initial pulsar has the resulted in a whole zoo of different manifestations of rotating neutron stars that emit across the electromagnetic spectrum. We heard exciting new search results from telescopes all around the world including a plethora of millisecond pulsars, discovered associated by following up unidentified Fermi sources and the fastest spinning pulsar in the Galactic disk and the slowest spinning pulsar.

We heard about the incredible history and variety of the binary pulsar population and the evolutionary scenarios that lead to this variety. We also heard about the growing classes of eclipsing binary millisecond pulsars and systems that transition between the active radio emitting and accreting phases and how they are teaching us about the formation, spin evolution and accretion physics.

The great advances made in emission physics across the electromagnetic spectrum, especially in the gamma-rays, and some of the challenges that are still remaining were presented. We heard about the initial observations at high-energies and then the revolution that has come with the new satellites and instruments. Computing advances have also allowed for greatly improved simulations of pulsar magnetospheres pushing us into the realm of realistic 3D models. These improvements are needed as we had a number of new results highlighting the interaction between spin and magnetospheric properties of pulsars, including changes at X-ray energies. Our understanding of the emission process and regions is being further enhanced by better polarisation and beam models as well as measurements of beam shapes from precessing systems. We also further explored the neutron star zoo and objects such as RCW103 and those that are bridging the magnetar-radio pulsar divide like PSR J1119-6127.

The vital role that pulsars in double neutron star binaries has played in our understanding of gravity and the roles that they continue to have, with ever new tests becoming possible with the Double pulsar, were presented. We also learnt about two new relativistic double neutron star systems which each in their own right can claim to be “firsts” and will further expand the gravity test parameter space. We heard about the steps forward in the ongoing search for gravitational waves in the nanoHertz regime and how these searches are being used to improve our understanding of the solar system.

The future is looking bright for pulsar and neutron star research with a whole range of new and upcoming telescopes being presented from the SKA, the low-frequency arrays, MeerKAT, CHIME, uGMRT, FAST, NICER, and ELT to name a few. We were also encouraged to think about where the field is heading and what big science questions need to be addressed with these new instruments.

Neutron stars as laboratories for the understanding of nuclear physics were explored with detailed examination of the roles of glitches in allowing us to understand the equation of state. We also explored the role of the superfluid and how we can learn more about its properties. Pulsars also have an impact on their surroundings, including possible companions or the surrounding medium, in the form of SNRs and pulsar wind nebulae. We explored the rich physics of these interactions. We also heard about the magnetar whose radio emission is proving key to studying the environment of the supermassive black hole at the Galactic centre. The rich array of pulsars located in globular clusters was presented and how these sources can be used to study the dynamics and provide evidence of the mass distributions and possible central intermediate mass black holes.

The interaction of the radio emission from pulsars with the magneto-ionic medium between the Earth and the source was richly studied. We had an excellent summary of the field and heard how low-frequency

RadioNet has received funding from the EU’s Horizon 2020 research and innovation programme under the grant agreement No 730562

observations are revealing important new properties of the scattering and dispersive structures in the interstellar medium. We also heard about new techniques for extracting information about these structures from very high time resolution data. We also heard about our improved understanding of the magnetic field distribution in globular clusters and our Galaxy.

This conference perfectly highlighted the rich variety of physics and astronomy that can be understood, tested and challenged by using pulsars and neutron stars and showed that there is an exciting future ahead for this field.

The various results presented at the conference (oral and posters) made use of the following RadioNet infrastructures: EVN, e-MERLIN, Effelsberg, LOFAR, WSRT and IRAM. This event has had two major impacts for the RadioNet community: 1) it allowed RadioNet researchers to disseminate results obtain through its infrastructures to the broader international community, 2) it provided an opportunity for a majority of the RadioNet community studying pulsars to meet in person and discuss current and future projects. The event generated media attention from a press release associated to the conference itself as well as at least one research result (Bassa et al.) reporting on the LOFAR detection of the fastest known millisecond pulsar n the Galactic field.

2 AGENDA OF THE EVENT

2.1 Talks

4 September 2017

9:00-9:30	Registration/Coffee/Welcome	
9:30-10:00	The Discovery of Pulsars	Jocelyn Bell Burnell
10:00-10:30	Neutron Star Zoo	Vicky Kaspi
10:30-10:45	LOFAR Tied Array All-Sky Survey for Pulsars and Fast Transients	Chia Min Tan
10:45-11:00	An Update on the GBNCC Pulsar Survey	Ryan Lynch
11:00-11:30	Coffee	
11:30-11:45	Search for Pulsars and Transients with the GMRT	Bhaswati Bhattacharyya
11:45-12:00	Discovery of Twelve Millisecond Pulsars in Fermi LAT Unassociated Sources With the GBT telescope	Siraprapa Sanpa-arsa
12:00-12:15	The Einstein@Home Gamma-ray Pulsar Survey	Colin Clark
12:15-12:30	A Fast Folding Algorithm for Large Scale Surveys, and the Discovery of the Slowest Spinning Radio Pulsar	Vincent Morello
12:30-12:45	50 Years of Candidate Pulsar Selection – What next?	Robert Lyon
12:45-13:00	Coherent De-dispersion: History and Results	Timothy Hankins
13:00-14:00	Lunch	
14:00-14:15	Millisecond Pulsar Surveys at Low Observing Frequencies	Cees Bassa
14:15-14:45	The First Binary Pulsars and What They Told Us About Binary Star Evolution	Dipankar Bhattacharya
14:45-15:00	X-Ray and Optical Properties of Black Widows and Redbacks	Mallory Roberts
15:00-15:15	A Decade of Transitional Millisecond Pulsars	Amruta Jaodand
15:15-15:30	A Black Widow Up Close	Robert Main
15:30-16:00	Coffee	
16:00-16:30	Pulsar Emission Physics: An Historical Overview	Alice Harding
16:30-16:45	Correlated Emission and Spin Variability in Radio Pulsars	Benjamin Shaw
16:45-17:00	Switching States in Pulsar Magnetospheres	Phrudth Jaroenjittichai
17:00-17:15	X-ray Properties of the Mode-switching Pulsar B0943+10	Sandro Mereghetti
17:15-17:30	PSR B0943+10: a Multi-wavelength Picture of a Mode Switching Pulsar	Anna Bilous
17:30-19:30	Reception	

RadioNet has received funding from the EU's Horizon 2020 research and innovation programme under the grant agreement No 730562

5 September 2017

9:00-9:30	Coffee	
9:30-10:00	Observing the Plasma-Physical Processes Behind Pulsar Radiation	Joanna Rankin
10:00-10:15	Organised Polarisation Variability in Radio Pulsars and the Consequences for Emission Theory	Cristina Ilie
10:15-10:30	Multi-wavelength Studies of the Crab Pulsar's Giant Pulses	Natalia Lewandowska
10:30-10:45	Mapping the Emission Location of the Crab Pulsar's Giant Pulses	Marten van Kerkwijk
10:45-11:00	3D Pulsar Magnetospheres from First Principles: Kinetic Simulations	Anatoly Spitkovsky
11:00-11:30	Coffee	
11:30-11:45	Pulsar Polarization: The View from the Southern Hemisphere	Simon Johnston
11:45-12:00	Comparing Gamma-ray Loud and Gamma-ray Quiet Radio Pulsars – A Unification Scheme	Patrick Weltevrede
12:00-12:15	PSR J1906+0746: From Spin-Precession to Emission Physics	Gregory Desvignes
12:15-12:30	Pulsar Observations in the Short Millimetre Regime	Pablo Torne
12:30-12:45	Gigahertz-peaked Spectra Pulsars	Karolina Rozko
12:45-13:00	The Noisy Ageing of Slow Pulsars: New Thoughts on the Evolution of the Pulsar Population	Aris Karastergiou
13:00-14:00	Lunch	
14:00-14:30	The First Multi-wavelength Pulsars	Wim Hermsen
14:30-15:00	The Multi-wavelength View of Pulsars	Elizabeth Ferrara
15:00-15:15	The Puzzling Source at the Center of the SNR RCW103	Alice Borghese
15:15-15:30	Magnetar-like Emission in Other Neutron Star Classes	Nanda Rea
15:30-16:00	Coffee	
16:00-16:15	Radio Silencing Magnetar Bursts	Robert Archibald
16:15-16:30	Hard Tails in High-Field Pulsars and Magnetars	Zorawar Wadiasingh
16:30-16:45	Magnetar Giant Flare High-energy Emission	Chris Elenbaas
16:45-17:00	The Missing Links of Neutron Star Evolution in the eROSITA Era	Adriana Mancini Pires
17:00-17:15	X-ray Emission from Millisecond Pulsars	Slavko Bogdanov
17:15-17:30	Modelling Energy-dependent Pulsar Light Curves	Christo Venter

6 September 2017

9:00-9:30	Coffee	
9:30-10:00	From Einstein's Theory to Gravity's Chirp	Joseph Taylor
10:00-10:30	Gravity Tests with Pulsars	Michael Kramer
10:30-10:45	The Discovery of the Most Relativistic Binary Pulsar: an Update from the HTRU-S Low Latitude Survey	Andrew Cameron
10:45-11:00	Testing General Relativity With the Pulsar Triple System	Anne Archibald
11:00-11:30	Coffee	
11:30-11:45	Strong Field Tests of Gravity with PSR J1141-6545	Vivek Venkatraman Krishnan
11:45-12:00	PSR J1913+1102: A Highly Asymmetric and Relativistic Double Neutron Star Binary System	Robert Ferdman
12:00-12:30	Gravitational Waves	K J Lee
12:30-12:45	Solar System Ephemerides, Pulsar Timing, and Navigation	Joseph Lazio
12:45-13:00	Solar-System Studies with Pulsar Timing Arrays	Nicolas Caballero
13:00-14:00	Lunch	
14:00-14:30	The SKA	Evan Keane
14:30-15:00	The Future of Pulsar Research and Facilities	Matthew Bailes
15:00-15:15	Pulsar Searches with the SKA	Lina Levin Preston
15:15-15:30	A Low-frequency Pulsar Renaissance	Jason Hessels
15:30-16:00	Coffee	
16:00-16:15	Enhancing MeerKAT	Ewan Barr
16:15-16:30	Pulsar Science with the Canadian CHIME Telescope	Cherry Ng
16:30-16:45	Time-domain Astronomy with the GMRT: uGMRT to eGMRT	Jayanta Roy
16:45-17:00	FAST	Di Li
17:00-17:15	Searching for X-ray Pulsations from Neutron Stars Using NICER	Paul Ray
17:15-17:30	Optical Pulsars in the Extremely Large Telescope Era	Andrew Shearer

RadioNet has received funding from the EU's Horizon 2020 research and innovation programme under the grant agreement No 730562

7 September 2017

9:00-9:30	Coffee	
9:30-10:00	Pulsar Glitches and their Impact on Neutron-star Astrophysics	Richard Manchester
10:00-10:30	Glitches/NS Masses and EOS	Bryn Haskell
10:30-10:45	Thermonuclear Burst Oscillations and the Dense Matter Equation of State	Anna Watts
10:45-11:00	Dynamical Onset of Superconductivity and Retention of Magnetic Fields in Cooling Neutron Stars	Wynn Ho
11:00-11:30	Coffee	
11:30-11:45	Glitch Activity of Radio Pulsars and Magnetars	Rafael Fuentes
11:45-12:00	Braking Indices and Spin Evolution	Cristobal Espinoza
12:00-12:15	The Peculiar Rotational History of PSR J0537-6910	Danai Antonopoulou
12:15-12:30	Neutron Star Equation of State and Uncertainty on the Radius Determination	Morgane Fortin
12:30-12:45	A Window into the Neutron Star: Modelling the Cooling of Accretion Heated Neutron Star Crusts	Marcella Wijngaarden
12:45-13:00	Magnetospheric Switching in PSR B1828-11	Ingrid Stairs
13:00-14:00	Lunch	
14:00-14:30	High Energy Beams and Winds	Roger Romani
14:30-15:00	Multimessenger (PWN/SNR/etc..)	Roberta Zanin
15:00-15:15	Timing Three Dozen Pulsars in Terzan 5 Over a Dozen Years	Scott Ransom
15:15-15:30	Evidence for an Intermediate-mass Black Hole in NGC 6624	Benetge Perera
15:30-16:00	Coffee	
16:00-16:15	The Pulsars in the Globular Clusters 47 Tucanae and M15: Latest Results from Long-term Timing	Alessandro Ridolfi
16:15-16:30	Magnetar Nebulae can be Rotationally-powered	Diego Torres
16:30-16:45	On the Radio-emitting Particles of the Crab Nebula: Stochastic Acceleration Model	Shuta Tanaka
16:45-17:00	Absorption-like Features in Middle-aged Pulsars	Prakash Arumugasamy
17:00-17:15	A Magnetar at the Heart of the Milky Way	Ralph Eatough
17:15-17:30	The Galactic Center Magnetar: Broadband Single Pulses from J1745-2900	Shami Chatterjee
17:30-21:00	Conference Dinner	

8 September 2017

9:00-9:30	Coffee	
9:30-10:00	The Magnetoionic Universe: the Astro-optics of Pulsars, Bursts, and SETI	James Cordes
10:00-10:15	Scattering Variability of the Crab Pulsar	Laura Driessen
10:15-10:30	Anomalous Pulsar Scattering at LOFAR Frequencies	Marisa Geyer
10:30-10:45	Solar Wind Monitoring with the German LOFAR Stations	Caterina Tiburzi
10:45-11:00	Anisotropy and Intermittency in the Interstellar Plasma	Barney Rickett
11:00-11:30	Coffee	
11:30-11:45	Scintillation Arcs Shed Light on Scattering from Planar Plasma Sheets	Dan Stinebring
11:45-12:00	Pulsar VLBI Scintillometry	Ue-Li Pen
12:00-12:15	Extreme Scattering Events Toward Two Young Pulsars	Matthew Kerr
12:15-12:30	Echoes in the Pulse Profile of PSR B2217+47	Daniele Michilli
12:30-12:45	Polarization Study of the Pulsars in the Globular Cluster 47 Tucanae	Ferderico Abbate
12:45-13:00	Studying Magnetic Fields using Low-frequency Pulsar Observations	Charlotte Sobey
13:00-13:15	Closing	
13:15-14:00	Lunch	

RadioNet has received funding from the EU's Horizon 2020 research and innovation programme under the grant agreement No 730562

2.2 Posters

1. Advances in our understanding of the free-precession candidate PSR B1828-11 - Ashton, Gregory
2. The X-ray Pulsar 2A 1822-371 as a super-Eddington source - Bak Nielsen, Ann-Sfie
3. Simultaneous Radio and X-Ray observation of Crab Pulsar - Basu, Avishek Kumar
4. Interstellar space weather toward timing-array millisecond pulsars - Bhat, Ramesh
5. Low frequency pulsar observations with LOFAR - Bondonneau, Louis
6. Phase-dependent absorption features in X-ray spectra of XDINSs - Borghese, Alice
7. X-ray bounds on the r-mode amplitude in millisecond pulsars - BOZTEPE, TU_GBA
8. Pulsar Magnetosphere: a more self consistent view from PIC simulations - Brambilla, Gabriele
9. Long Timescale Pulsar Variability - Brook, Paul
10. A search for single FRB-like pulses from magnetars - Burgay, Marta
11. Millisecond pulsars in globular clusters - Cadelano, Mario
12. First interferometric detections of fast radio bursts - Caleb, Manisha
13. Superburst Oscillations - Chambers, Frank
14. Systematic study of magnetar outbursts - Coti Zelati, Francesco
15. Prospects for Discovering Pulsars in Future Continuum Surveys - Dai, Shi
16. Glitch time series - Darehmoradi, Mohammad
17. Observing Pulsars with a Phased Array Feed at the Parkes Telescope - Deng, Xinping
18. Radio pulsar beam and polarisation - Dyks, Jaroslaw
19. Precision timing analysis of the highly energetic young pulsar PSR J0537-6910 - Ferdman, Robert
20. Long-term Timing of the Pulsar-Triple System in Messier 4 - Fonseca, Emmanuel
21. Magnetic _eld con_gurations of magnetars - Fujisawa, Kotaro
22. The onset of low Prandtl number thermal convection in thin spherical shells - Garcia Gonzalez, Ferran
23. Going from pulsars to Fast Radio Bursts - Gardenier, David
24. Magnetic Axis Wobbling in Strongly Magnetised Pulsars - Gourgouliatos, Kostas
25. Interstellar medium studies below 200 MHz: LOFAR single stations and NenuFAR - Griessmeier, Jean-Mathias
26. The broad X-ray emission of PSR J0437-4715 - Guillot, Sebastien
27. Conquering systematics in the timing of the Pulsar Triple System PSR J0337+1715 - Gusinskaia, Nina
28. A new look at pulsar distances and the gamma-ray luminosity of PSR J0218+4232 - Igoshev, Andrei
29. Status and Early Science of the Thai 40-m Radio Telescope - Jaroenjittichai, Phrudth
30. Probing pulsar interiors via timing measurements - Jones, Ian
31. Peculiar nulling observed in PSR B1706-16 with Ooty Radio Telescope and the GMRT - Joshi, Bhal Chandra
32. Wide band simultaneous multi-frequency single pulse study of PSR J1822-2256 - Joshi, Bhal Chandra
33. On sub-pulse drift related pro_le mode-changes studied with a new technique - Joshi, Bhal Chandra
34. Understanding the Pulsar High-Energy Emission: Macroscopic and Kinetic Models - Kalapotharakos, Constantinos
35. Thermal absorption in gigahertz-peaked spectra pulsars - Kijak, Jaroslaw
36. Luminosity of synchrotron radiation in pulsar magnetospheres - Kisaka, Shota
37. Evolution of a neutron star's magnetic inclination angle through internal dissipation - Lander, Samuel
38. Is „anomalous scattering" typical for pulsars? - Lewandowski, Wojciech
39. New EOSs for supramassive quark stars - Li, Ang
40. Measuring the frequency second derivative in high-precision pulsar timing - Liu, Xiaojin
41. Towards understanding the ISM turbulence using pulsars - MA, Krishnakumar
42. A precise treatment of the sub-pulse phase and its effects on observables - Maan, Yogesh
43. Mode-switching and giant pulses in the Black Widow pulsar - Mahajan, Nikhil
44. Transitional Radio Pulsar PSR J1119-6127 - Majid, Walid
45. PAFINDER - Malenta, Mateusz
46. Machine Learning for Radio Transient Detection - McFadden, Rebecca
47. LEAP: The Large European Array for Pulsars - Overview and Update - McKee, James
48. Mapping emission regions in pulsar magnetospheres: simultaneous observations of subpulse drifting with the MWA and the GMRT - McSweeney, Samuel
49. PSG Model and Complicity Parameter: Theory and Observations - Melikidze, George
50. Spectral Flattening of Crab Giant Pulses at Low Frequencies - Meyers, Bradley
51. 1,000,000 Giant Pulses from the Crab Pulsar - Mickaliger, Mitch
52. Extragalactic pulsar searches in nearby galaxies with LOFAR: M31, M33, M81, M82 - Mikhailov, Klim
53. The Extent and Observable Properties of Nuclear Pasta in Neutron Star Crusts - Newton, William
54. Blind Search Methods for Binary Gamma-ray Pulsars - Nieder, Lars

RadioNet has received funding from the EU's Horizon 2020 research and innovation programme under the grant agreement No 730562

55. High Time Resolution Astronomical Polarimetry with the Galway Astronomical Stoke Polarimeter - O'Connor, Eoin
56. Last results from the Nan_cay pulsar survey SPAN512 - Octau, Franck
57. Multi-messenger follow-up of FRBs from ALERT - Oostrum, Leon
58. Gravitational wave emission from neutron stars - Osborne, Emma
59. A Search for Long-Period Pulsars with a Fast-Folding Algorithm in the PALFA Survey - Parent, Emilie
60. A uni_ed model of supernova explosion driven by magnetic monopoles - Peng, Qiuhe
61. Galactic center survey with the multi-feed S-band receiver at the SRT - Perrodin, Delphine
62. A multi-wavelength pipeline for pulsar searches - Pilia, Maura
63. Eclipse analysis of J1810+1744 - Polzin, Elliott
64. From Neutron Star Observables to the Equation of State - Raithel, Carolyn
65. FLAG: Commissioning and a survey for pulsars and fast transients - Rajwade, Kaustubh
66. The interpretation of broadband data from pulsars - Rammala, Isabella
67. Exploring the Physical Conditions in Millisecond Pulsar Emission Regions - Rankin, Joanna
68. Understanding the Orientations of Pulsar Radiation and Supernova „Kicks" - Rankin, Joanna
69. Inferring Pulsar Microstructure Timescales - Rankin, Joanna
70. X-BOsS: An open-source code for neutron star X-ray Burst Oscillation Simulation - RILEY, THOMAS
71. Thermal Evolution of Old Neutron Stars - Rodriguez, Luis
72. MeerTRAP: A real-time survey for pulsars and fast transients with MeerKAT - Sanidas, Sotiris
73. Monitoring Pulsars with a Phased Array Feed (PAF) Receiver - Sarkissian, John
74. High Time Resolution Astrophysics on Next Generation Systems - Scragg, Thomas
75. On the patchiness of spectra of individual pulses of pulsars at low radio frequencies - Song, Xiaoxi
76. Searching for young, hidden pulsars - Straal, Samayra
77. ALFABURST: A commensal radio transient survey with ALFA - Surnis, Mayuresh
78. Characteristics of drifting subpulses and physical conditions at the polar cap - Szary, Andrzej
79. Modeling the E_ect of Kick Velocity during the Accretion Induced Collapse of White Dwarfs on Binary Pulsars - Taani, Ali
80. Pulsars as plasma machines: how dense the plasma in pulsar magnetosphere can be? - Timokhin, Andrey
81. Order parameters for the high-energy spectra of pulsars - Torres, Diego F.
82. Low frequency pulsar polarimetry with the MWA - Tremblay, Steven
83. Millisecond pulsars as standards: timing, positioning and communication - Vidal, Cl_ement
84. X-ray bounds on the r-mode amplitude in millisecond pulsars - Vurgun, Eda
85. Modeling Non-thermal Emission from „Black Widow" and „Redback" Millisecond Pulsar Binaries in the Rotation-Powered State - Wadiasingh, Zorawar
86. RRAT studies with the e-MERLIN interferometer - Walker, Charlie
87. PSRSALSA: an open-source pulsar data-analysis package - Weltevrede, Patrick
88. Evidence for elliptical pulsar beams - Wright, Geoff
89. Self-consistent numerical research for inhomogeneous chiral phase transition in neutron stars - Yasutake, Nobutoshi
90. Systematic analysis about the polarization in thermal radiations of magnetars - Yatabe, Akihiro
91. Dependence of pulsar death line on the equation of state - Zhou, Xia

3 PARTICIPANTS

The year 2017 marks the 50th anniversary of the discovery of pulsars and is thus an excellent moment to reflect on what we have learnt from these remarkable physical laboratories and to cast our eyes forward to the exciting opportunities they provide for physical and astrophysical studies in the coming decades. In September 2017 the International Astronomical Union Symposium 337 provided the ideal opportunity to do just that. More than 200 participants from 20 countries assembled at Jodrell Bank Observatory/UK on the Cheshire plains in the shadow of the Lovell Telescope for this one-week symposium.

There were a total of 91 talks and 91 posters. The talks were well balanced between historical presentations, which placed the context for the field, state-of-the-art presentations which summarized where we are now and those which presented new results and looked to the future. There were a lot of young speakers and many for whom this was their first presentation at an international meeting. Gender balance was also excellent with 31% of the talks by female speakers. This combination led to a very vibrant and dynamic set of talks. The posters were presented in the marquee where all the coffee, lunch and social events took place, which allowed for lots of time for viewing and discussion.

RadioNet has received funding from the EU's Horizon 2020 research and innovation programme under the grant agreement No 730562

The location of the meeting at the Observatory had two important influences on the enjoyment of the meeting. The first was the lack of internet and mobile phone access in the lecture theatre. This resulted in many of the attendees commenting on the high percentage of people present in all the talks and the number of questions and the depth of the discussions. The second was the fact that everybody was present on site the whole day, including breaks, meant that the opportunities for interaction and discussion were maximized.

To commemorate the anniversary of the discovery of pulsars and the meeting a sustainable, permanent memorial in the form of a Crab Apple tree, Malus 'White Star' was planted near the Lovell telescope by Dame Jocelyn Bell-Burnell. At the same location each of the participants in the meeting were invited to plant a Daffodil, Narcissus 'Woodland Star' as their own memorial to the meeting and anniversary.

Outreach events included special events organized in the lead up to the symposium at the Jodrell Bank Discovery Centre for he public and in particular school children. Shortly after the conference a Girls Night Out event was also organized which concentrated on pulsars and also took place at the Discovery Centre. A completely full, more than 200 people, public lecture was given during the symposium by Prof. Joel Weisberg that was extremely well received. During the meeting recordings of interviews made with participants and these will be broadcast as a special edition of the popular podcast, the Jodcast.

Overall the meeting was a fitting occasion to commemorate 50 years since the discovery of pulsars.

Signed participant list is attached.

RadioNet has received funding from the EU's Horizon 2020 research and innovation programme under the grant agreement No 730562

4 RADIONET FINANCIAL CONTRIBUTION

The RadioNet funds were entirely devoted to provide support to EU students/postdocs to attend the conference, as a subsidy to pay a fraction of the registration fees. The participants were chosen across the various participating country and also provide gender balance.

FIRST NAME	LAST NAME	COUNTRY (INSTITUTE)
Ann-Sofie	Bak Nielsen	The Netherlands
Nina	Gusinskaia	The Netherlands
Cristina-Diana	Ilie	United Kingdom
Amruta	Jaodand	The Netherlands
Eoin	O'Connor	Ireland
Franck	Octau	France
Emma	Osborne	United Kingdom
Samuel	Lander	Poland
Thomas	Scragg	United Kingdom

5 PUBLICATIONS

Proceedings of this conference are to be published by Cambridge University Press, and electronic access to the proceedings will become public 18 months after publication.

6 SIGNED PARTICIPANT' LIST

RadioNet has received funding from the EU's Horizon 2020 research and innovation programme under the grant agreement No 730562

Participants

Federico, **Abbate**, University of Milano-Bicocca, Italy f.abbate@campus.unimib.it
Crispin, **Agar**, University of Manchester, United Kingdom crispin.agar@gmail.com
Nils, **Andersson**, University of Southampton, United Kingdom na@maths.soton.ac.uk
Danai, **Antonopoulou**, Nicolaus Copernicus Astronomical Centre, Poland antonopoulou.danai@gmail.com
Anne, **Archibald**, University of Amsterdam, The Netherlands a.archibald@uva.nl
Robert, **Archibald**, University of Toronto, Canada rarchiba@physics.mcgill.ca
Houshang, **Ardavan**, University of Cambridge, United Kingdom ardavan@ast.cam.ac.uk
Prakash, **Arumugasamy**, National Centre for Radio Astrophysics, India prakash@ncra.tifr.res.in
Zaven, **Arzoumanian**, NASA Goddard Space Flight Center, USA zaven.arzoumanian@nasa.gov
Gregory, **Ashton**, AEI Hannover, Germany gregory.ashton@aei.mpg.de
Matthew, **Bailes**, Swinburne University of Technology, Australia mbailes@swin.edu.au
Ann-Sofie, **Bak Nielsen**, Leiden Observatory, The Netherlands nielsen@strw.leidenuniv.nl
Ewan, **Barr**, MPIfR, Germany ewan.d.barr@gmail.com
Cees, **Bassa**, ASTRON, The Netherlands bassa@astron.nl
Avishek Kumar, **Basu**, NCRA-TIFR, India avishek@ncra.tifr.res.in
Jocelyn, **Bell Burnell**, University of Oxford, United Kingdom jocelyn@astro.ox.ac.uk
Vasily, **Beskin**, Lebedev Institute & Moscow Institute of Physics and Technology, Russia beskin@lpi.ru
Ramesh, **Bhat**, ICRAR-Curtin University, Australia Ramesh.Bhat@curtin.edu.au
Dipankar, **Bhattacharya**, Inter-University Centre for Astronomy & Astrophysics, India dipankar@iucaa.in
Bhaswati, **Bhattacharyya**, NCRA-TIFR, India bhaswati@ncra.tifr.res.in
Anna, **Bilous**, University of Amsterdam, The Netherlands hanna.bilous@gmail.com
Slavko, **Bogdanov**, Columbia University, USA slavko@astro.columbia.edu
Louis, **Bondonneau**, LPC2E, France louis.bondonneau@cnrs-orleans.fr
Alice, **Borghese**, University of Amsterdam, The Netherlands a.borghese@uva.nl
Gabriele, **Brambilla**, NASA Goddard Space Flight Center, USA gb.gabrielebrambilla@gmail.com
Rene, **Breton**, University of Manchester, United Kingdom rene.breton@manchester.ac.uk
Paul, **Brook**, West Virginia University, USA paul.brook@gmail.com
Marta, **Burgay**, INAF-OAC, Italy burgay@oa-cagliari.inaf.it
Nicolas , **Caballero**, MPIfR, Germany caball@mpifr-bonn.mpg.de
Mario, **Cadelano**, University of Bologna, Italy mario.cadelano@unibo.it
Ilaria, **Caiazzo**, University of British Columbia, Canada ilariacaiazzo@phas.ubc.ca
Manisha, **Caleb**, University of Manchester, United Kingdom manishacaleb@gmail.com
Andrew, **Cameron**, MPIfR, Germany acameron@mpifr-bonn.mpg.de
Fernando, **Camilo**, SKA South Africa, South Africa fernando@ska.ac.za
Frank, **Chambers**, University of Amsterdam, The Netherlands frnchambers@uva.nl
Shami, **Chatterjee**, Cornell University, USA shami@astro.cornell.edu
Colin, **Clark**, AEI Hannover, Germany colin.clark@aei.mpg.de
Sally, **Cooper**, University of Manchester, United Kingdom sally.cooper@manchester.ac.uk
Jim, **Cordes**, Cornell University, USA jmc33@cornell.edu
Alessandro, **Corongiu**, INAF-OAC, Italy corongiu@oa-cagliari.inaf.it
Francesco, **Coti Zelati**, Institute of Space Sciences (CSIC-IEEC), Spain cotizelati@ice.csic.es
Shi, **Dai**, CSIRO Astronomy and Space Science, Australia shi.dai@csiro.au
Xinping, **Deng**, MPIfR, Germany deng@mpifr-bonn.mpg.de
Gregory, **Desvignes**, MPIfR, Germany gdesvignes@mpifr-bonn.mpg.de
Laura, **Driessen**, University of Manchester, United Kingdom laura@driessen-net.com
Jaroslaw, **Dyks**, Nicolaus Copernicus Astronomical Centre, Poland jinx@ncac.torun.pl
Ralph, **Eatough**, MPIfR, Germany reatough@mpifr-bonn.mpg.de
Chris, **Elenbaas**, University of Amsterdam, The Netherlands C.P.C.Elenbaas@uva.nl
Cristobal, **Espinoza**, University of Santiago, Chile cristobal.espinoza.r@usach.cl
Robert, **Ferdman**, University of East Anglia, United Kingdom r.ferdman@uea.ac.uk
Elizabeth, **Ferrara**, University of Maryland, USA Elizabeth.C.Ferrara@nasa.gov
Chris, **Flynn**, Swinburne University of Technology, Australia cflynn@swin.edu.au
Emmanuel, **Fonseca**, McGill University, Canada efonseca@physics.mcgill.ca
Morgane, **Fortin**, Nicolaus Copernicus Astronomical Centre, Poland fortin@camk.edu.pl
Rafael, **Fuentes**, PUC, Chile jrfuentes@uc.cl
Kotaro, **Fujisawa**, Waseda University, Japan fujisawa@heap.phys.waseda.ac.jp
Ferran, **Garcia Gonzalez**, University of Amsterdam, The Netherlands F.GarciaGonzalez@uva.nl
David, **Gardenier**, ASTRON/University of Amsterdam, The Netherlands gardenier@astron.nl
Marisa, **Geyer**, University of Oxford, United Kingdom marisa.geyer@gmail.com
Francis, **Graham-Smith**, University of Manchester, United Kingdom fgsegs@talktalk.net
Jean-Mathias, **Griessmeier**, LPC2E & Nançay Radio Observatory, France jean-mathias.griessmeier@cnrs-orleans.fr
Sebastien, **Guillot**, PUC, Chile sguillot@astro.puc.cl
Nina, **Gusinskaia**, University of Amsterdam, The Netherlands geminga.neiman@gmail.com
Timothy, **Hankins**, New Mexico Institute of Mining and Technology, USA thankins@aoc.nrao.edu
Alice, **Harding**, NASA Goddard Space Flight Center, USA Alice.K.Harding@nasa.gov
Brynmor, **Haskell**, Nicolaus Copernicus Astronomical Center, Poland bhaskell@camk.edu.pl
Wim, **Hermsen**, SRON, The Netherlands W.Hermsen@sron.nl
Jason, **Hessels**, ASTRON/University of Amsterdam, The Netherlands J.W.T.Hessels@uva.nl
Jeremy, **Heyl**, University of British Columbia, Canada heyl@phas.ubc.ca
Wynn, **Ho**, University of Southampton, United Kingdom wynn.ho@soton.ac.uk
Andrei, **Igoshev**, IMAPP/Radboud University, The Netherlands a.igoshev@astro.ru.nl
Cristina-Diana, **Ilie**, University of Manchester, United Kingdom cristina.ilie@postgrad.manchester.ac.uk
Gemma, **Janssen**, ASTRON, The Netherlands janssen@astron.nl
Amruta, **Jaodand**, ASTRON, The Netherlands jaodand@astron.nl
Phrudth, **Jaroenjittichai**, NARIT, Thailand phrudth@narit.or.th
Simon, **Johnston**, CSIRO, Australia Simon.Johnston@csiro.au
Ian, **Jones**, University of Southampton, United Kingdom d.i.jones@soton.ac.uk
Bhal Chandra, **Joshi**, NCRA-TIFR, India bcj@ncra.tifr.res.in
Constantinos, **Kalapotharakos**, NASA GSFC UMCP, USA ckalapotharakos@gmail.com
Aris, **Karastergiou**, University of Oxford, United Kingdom aris.karastergiou@physics.ox.ac.uk
Victoria, **Kaspi**, McGill University, Canada vkaspi@physics.mcgill.ca
Evan, **Keane**, SKA Organisation, United Kingdom Evan.Keane@gmail.com
Michael, **Keith**, University of Manchester, United Kingdom michael.keith@manchester.ac.uk
Matthew, **Kerr**, U.S. Naval Research Laboratory, USA matthew.kerr@nrl.navy.mil
Jaroslaw, **Kijak**, University of Zielona Góra, Poland jkijak@astro.ia.uz.zgora.pl
Shota, **Kisaka**, Aoyama Gakuin University, Japan kisaka@phys.aoyama.ac.jp
Vladislav, **Kondratiev**, ASTRON, The Netherlands vlad.kondratiev@gmail.com
Michael, **Kramer**, MPIfR/University of Manchester, Germany/United Kingdom mkramer@mpifr-bonn.mpg.de
Joseph, **Kwofie**, University of Manchester, United Kingdom joseph.kwofie@postgrad.manchester.ac.uk
Samuel, **Lander**, CAMK, Poland samuel.k.lander@gmail.com
Joseph, **Lazio**, JPL/Caltech, USA Joseph.Lazio@jpl.nasa.gov
Kejia, **Lee**, Peking University, China kjlee@pku.edu.cn
Lina, **Levin Preston**, University of Manchester, United Kingdom lina.s.levin@gmail.com
Natalia, **Lewandowska**, Green Bank Observatory, USA nlewando@nrao.edu
Wojciech, **Lewandowski**, University of Zielona Góra, Poland w.lewandowski@ia.uz.zgora.pl
Di, **Li**, National Astronomical Observatories of China, China dili@nao.cas.cn
ANG, **LI**, Xiamen University, China liang@xmu.edu.cn
Kuo, **Liu**, MPIfR, Germany xiao-jin.liu@postgrad.manchester.ac.uk
Xiaojin, **Liu**, University of Manchester, United Kingdom kliu.psr@gmail.com
Ryan, **Lynch**, Green Bank Observatory, USA rlynch@nrao.edu
Andrew, **Lyne**, University of Manchester, United Kingdom andrew.lyne@manchester.ac.uk
Robert, **Lyon**, University of Manchester, United Kingdom robert.lyon@manchester.ac.uk

Krishnakumar, **Ma**, NCRA-TIFR, India kk.ambalappat@gmail.com
Yogesh, **Maan**, ASTRON, The Netherlands maan@astron.nl
Dustin, **Madison**, NRAO, USA dmadison@nrao.edu
Nikhil, **Mahajan**, University of Toronto, Canada mahajan@astro.utoronto.ca
Robert, **Main**, University of Toronto, Canada main@astro.utoronto.ca
Walid, **Majid**, JPL/Caltech, USA majidw@gmail.com
Mateusz, **Malenta**, University of Manchester, United Kingdom mateusz.malenta@manchester.ac.uk
Richard, **Manchester**, CSIRO, Australia dick.manchester@csiro.au
Adriana, **Mancini Pires**, AIP, Germany apires@aip.de
Rebecca, **McFadden**, University of Oxford, United Kingdom rebecca.mcfadden@eng.ox.ac.uk
James, **McKee**, MPIfR, Germany jamesmckee23@gmail.com
Samuel, **McSweeney**, ICRAR-Curtin University, Australia Sam.McSweeney@curtin.edu.au
George, **Melikidze**, University of Zielona Góra, Poland gogi@astro.ia.uz.zgora.pl
Sandro, **Mereghetti**, IASF-Milano, INAF sandro@iasf-milano.inaf.it
Bradley, **Meyers**, ICRAR-Curtin University, Australia bradley.meyers@postgrad.curtin.edu.au
Daniele, **Michilli**, University of Amsterdam/ASTRON, The Netherlands danielemichilli@gmail.com
Mitch, **Mickaliger**, University of Manchester, United Kingdom mitch.mickaliger@gmail.com
Klim, **Mikhailov**, University of Amsterdam, The Netherlands mixklim@gmail.com
Vincent, **Morello**, University of Manchester, United Kingdom vmorello@gmail.com
William, **Newton**, Texas A&M University-Commerce, USA william.newton@tamuc.edu
Cherry, **Ng**, University of British Columbia, Canada cherrywyng@gmail.com
Lars, **Nieder**, AEI Hannover, Germany lars.nieder@aei.mpg.de
Eoin, **O'Connor**, NUI, Ireland e.oconnor35@nuigalway.ie
Franck, **Octau**, LPC2E, France franck.octau@cnrs-orleans.fr
Timothy, **Olszanski**, University of Vermont, USA timothyolszanski@gmail.com
Leon, **Oostrum**, ASTRON/University of Amsterdam, The Netherlands l.c.oostrum@uva.nl
Emma, **Osborne**, University of Southampton, United Kingdom emma.osborne@soton.ac.uk
Emilie, **Parent**, McGill University, Canada parente@physics.mcgill.ca
Ue-Li, **Pen**, University of Toronto, Canada pen@cita.utoronto.ca
Bo, **Peng**, Chinese Academy of Sciences, China qhpeng@nju.edu.cn
Qiuhe, **Peng**, Nanjung University, China pb@nao.cas.cn
Timothy, **Pennucci**, ELTE, USA pennucci@email.virginia.edu
Benetge, **Perera**, University of Manchester, United Kingdom bhakthiperera@gmail.com
Delphine, **Perrodin**, INAF-OAC, Italy delphine@oa-cagliari.inaf.it
Emily, **Petroff**, ASTRON, The Netherlands ebpetroff@gmail.com
Maura, **Pilia**, INAF-OAC, Italy mpilia@oa-cagliari.inaf.it
Elliott, **Polzin**, University of Manchester, United Kingdom elliott.polzin@manchester.ac.uk
Andrea, **Possenti**, INAF-OAC, Italy possenti@oa-cagliari.inaf.it
Carolyn, **Raithel**, University of Arizona, USA craithel@email.arizona.edu
Kaustubh, **Rajwade**, University of Manchester, United Kingdom rkaustubh10@gmail.com
Isabella, **Rammala**, Rhodes University, South Africa irammala@ska.ac.za
Joanna, **Rankin**, University of Vermont, USA Joanna.Rankin@uvm.edu
Scott, **Ransom**, NRAO, USA sransom@nrao.edu
Paul, **Ray**, U.S. Naval Research Laboratory, USA paul.ray@nrl.navy.mil
Nanda, **Rea**, Institute of Space Sciences (CSIC-IEEC), Spain rea@ice.csic.es
Barney, **Rickett**, University of California San Diego, USA bjrickett@ucsd.edu
Alessandro, **Ridolfi**, MPIfR, Germany aridolfi@mpifr-bonn.mpg.de
Thomas, **Riley**, University of Amsterdam, The Netherlands T.E.Riley@uva.nl
Mallory, **Roberts**, New York University Abu Dhabi, United Arab Emirates malloryr@gmail.com
Luis, **Rodriguez**, PUC, Chile lsrodrig@uc.cl
Roger, **Romani**, Stanford University, USA rwr@astro.stanford.edu
Jayanta, **Roy**, NCRA-TIFR, India jroy@ncra.tifr.res.in
Karolina, **Rozko**, University of Zielona Gora, Poland krozko@gmail.com
Sotiris, **Sanidas**, University of Manchester, United Kingdom sotirios.sanidas@manchester.ac.uk
Siraprapa, **Sanpa-arsa**, NARIT, Thailand s.tuck.sanpaarsa@gmail.com
John, **Sarkissian**, CSIRO-Parkes Observatory, Australia John.Sarkissian@csiro.au
Paul, **Scholz**, Dominion Radio Astrophysical Observatory, Canada paul.scholz@nrc-cnrc.gc.ca
Thomas, **Scragg**, University of Manchester, United Kingdom thomas.scragg@postgrad.manchester.ac.uk
Benjamin, **Shaw**, University of Manchester, United Kingdom benjamin.shaw@manchester.ac.uk
Andrew, **Shearer**, National University of Ireland, Ireland andy.shearer@nuigalway.ie
Wolfgang, **Sieber**, Hochschule Niederrhein, Germany kw.sieber@t-online.de
David, **Smith**, CNRS Bordeaux, France smith@cenbg.in2p3.fr
Charlotte, **Sobey**, ICRAR-Curtin University & CSIRO, Australia c.sobey@curtin.edu.au
Xiaoxi, **Song**, University College London, United Kingdom xiao.song.13@ucl.ac.uk
Anatoly, **Spitkovsky**, Princeton University, USA anatoly@astro.princeton.edu
Ingrid, **Stairs**, University of British Columbia, Canada stairs@astro.ubc.ca
Ben, **Stappers**, University of Manchester, United Kingdom ben.stappers@manchester.ac.uk
Dan, **Stinebring**, Oberlin College, USA dan.stinebring@oberlin.edu
Samayra, **Straal**, University of Amsterdam, The Netherlands s.m.straal@uva.nl
Mayuresh, **Surnis**, West Virginia University, USA msurnis@gmail.com
Andrzej, **Szary**, ASTRON, The Netherlands szary@astron.nl
Chia Min, **Tan**, University of Manchester, United Kingdom chiamin.tan@postgrad.manchester.ac.uk
Shuta, **Tanaka**, Konan University, Japan sjtanaka@center.konan-u.ac.jp
Joseph, **Taylor**, Princeton University, USA joe@princeton.edu
Caterina, **Tiburzi**, MPIfR/Bielefeld University, Germany ctiburzi@mpifr-bonn.mpg.de
Andrey, **Timokhin**, NASA Goddard Space Flight Center, USA andrey.timokhin@nasa.gov
Pablo, **Torne**, IRAM, Spain torne@iram.es
Diego F., **Torres**, ICREA & Institute of Space Sciences (IEEC-CSIC), Spain dtorres@ice.csic.es
Steven, **Tremblay**, Curtin University, Australia steven.tremblay@curtin.edu.au
Edward, **van den Heuvel**, University of Amsterdam, The Netherlands E.P.J.vandenHeuvel@uva.nl
Elmarie, **van Heerden**, University of Oxford, United Kingdom elmarie.vanheerden@eng.ox.ac.uk
Marten, **van Kerkwijk**, University of Toronto, Canada mhvk@astro.utoronto.ca
Joeri, **van Leeuwen**, ASTRON/University of Amsterdam, The Netherlands leeuwen@astron.nl
Vivek, **Venkatraman Krishnan**, Swinburne University of Technology, Australia vkrishnan@swin.edu.au
Christo, **Venter**, NWU, South Africa christo.venter7@gmail.com
Clément, **Vidal**, VUB, Belgium contact@clemvidal.com
Zorawar, **Wadiasingh**, CSR NWU, South Africa zwadiasingh@gmail.com
Charlie, **Walker**, University of Manchester, United Kingdom charles.walker@postgrad.manchester.ac.uk
Anna, **Watts**, University of Amsterdam, The Netherlands A.L.Watts@uva.nl
Joel, **Weisberg**, Carleton College, USA jweisber@carleton.edu
Patrick, **Weltevrede**, University of Manchester, United Kingdom Patrick.Weltevrede@manchester.ac.uk
Marcella, **Wijngaarden**, U. of Amsterdam, The Netherlands marcella.wijngaarden@student.uva.nl
Graham, **Woan**, University of Glasgow, United Kingdom graham.woan@glasgow.ac.uk
Geoff, **Wright**, University of Manchester, United Kingdom geoffrey.wright@manchester.ac.uk
Nobutoshi, **Yasutake**, Chiba Institute of Technology, Japan nobutoshi.yasutake@p.chibakoudai.jp
Akihiro, **Yatabe**, Waseda University, Japan yatabe@heap.phys.waseda.ac.jp
Roberta, **Zanin**, MPIK, Germany Roberta.Zanin@mpi-hd.mpg.de
Xia, **Zhou**, Xinjiang Astronomical Observatory, China zhouxia@xao.ac.cn

I confirm that the people listed above attended the IAU S337.

Rene Breton, IAU S337 co-chair