

Commission J

Session	Number of slots
J01	6
New Telescopes on the Frontier	
Conveners: Nipanjana Patra, Jeff Wagg, Arnold van Ardenne, Pietro Bolli	
Convener Emails: Nipanjana.Patra@curtin.edu.au, J.Wagg@skatelescope.org, ardenne@astron.nl, pbolli@arcetri.inaf.it	
<p>We have entered a golden age for radio astronomy, with new facilities coming online around the globe. During the next several years, these telescopes will pave the way for the two SKA1 telescopes to be built in Western Australia and South Africa. Collectively, they work at the frontier of technology and science. This session will highlight new and upgraded cm-to-m wavelength interferometers that will be operating before SKA1 early science begins.</p>	

Session	Number of slots
J02	6
Recent and future space missions	
Conveners: Joseph Lazio, Heino Falcke and Yuri Kovalev.	
Convener Emails: Joseph.Lazio@jpl.nasa.gov, h.falcke@astro.ru.nl, yyk@asc.rssi.ru	
<p>Space missions have enhanced VLBI capabilities and are close to opening up the radio window below 30 MHz by (swarms of) small satellites in space. These developments are facilitated by the advent of the standard CubeSat platform, which reduces mission costs significantly.</p>	

Session	Number of slots
J03	6
Single-dish instruments	
Conveners: Alex Kraus, Anish Roshi, Jin Chengjin	
Convener Emails: akraus@mpifr.de, anish.roshi@gmail.com, cjjin@bao.ac.cn	
<p>Even in the age of interferometers, single-dish telescopes are important instruments for radio astronomical research, either for the detection of diffuse emission (sometimes in combination with interferometers to provide „zero spacings“), for observing pulsars or monitoring variability of flux density or line emission. New technology like Phased-Array-Feeds may greatly enhance the ability and efficiency of single-dish telescopes, e.g. by providing a FoV an order of magnitude larger than with conventional receivers.</p> <p>This session should be dedicated to the discussion of new or planned single-dish telescopes as well as to their instrumentation.</p>	

Session	Number of slots
J04	6
Very long baseline interferometry	
Conveners: Francisco Colomer, Taehyun Jung, Chris Jacobs, Tiziana Venturi	
Convener Emails: colomer@jive.eu, thjung@kasi.re.kr, christopher.s.jacobs@jpl.nasa.gov, tventuri@ira.inaf.it	
<p>Very Long Baseline radio Interferometry (VLBI) is a mature technique, whose applications in astronomy, geodesy and planetary sciences are unique now that the need for milliarcsecond angular resolution and for extremely accurate localisation are the ultimate frontiers for some of the hottest scientific areas. For this reason, VLBI is in the heart of some of the most advanced present and future instruments and developments (EHT, ngVLA, SKA, VGOS).</p> <p>This session will bring together experts in each field of application, to provide a view of the state-of-the-art and the desired developments, and to assess the central relevance of VLBI in the continuously evolving landscape of astrophysics, Earth and planetary sciences.</p>	

Session	Number of slots
J05	6
Millimeter and sub-millimeter arrays	
Conveners: Sheng-Cai Shi, Raymond Blundell	
Convener Emails: scshi@pmo.ac.cn, pmosis@gmail.com, rblundell@cfa.harvard.edu	
<p>This session will focus on results and developments in (sub-)millimeter instrumentation covering the following broad areas:</p> <ul style="list-style-type: none"> - Current performance and future capabilities of major interferometric arrays. A few science results should be included that demonstrate performance. - Design and/or development of heterodyne instrumentation for radio telescopes, both interferometric arrays and single-dish. A summary of the scientific rationale for any developments should be included. 	

Session	Number of slots
J06	12
Antennas and Receivers: Simulation, Design and Calibration	
Conveners: Jacki Gilmore, Douglas Hayman, Pietro Bolli, David Davidson	
Convener Emails: jackivdm@sun.ac.za, douglas.hayman@csiro.au, pbolli@arcetri.inaf.it, david.davidson@curtin.edu.au	
<p>In this session we address the antenna and receiver technologies which enable new radio telescopes. We focus on the importance of practical calibration for detailed system design, including how advances in simulation enable the new calibration strategies needed for all-sky instruments. We also highlight advances in single components of the receiving chain such as low noise amplifiers.</p>	

Session	Number of slots
J07	6
Digital Signal Processing: Algorithms and Platforms	
Conveners: Albert-Jan Boonstra, Grant Hampson	
Convener Emails: boonstra@astron.nl, Grant.hampson@csiro.au	
Keywords: beam forming, spectral filtering, online RFI mitigation, FPGAs and other hardware platforms	

Session	Number of slots
J08	10
Short duration transients, FRBs and pulsars: observations, techniques and instrumentation	
Conveners: Jason Hessels, Evan Keane, Franz Kirsten, Kenzie Nimmo	
Convener Emails: J.W.T.Hessels@uva.nl, E.Keane@skatelescope.org, franz.kirsten@chalmers.se, k.nimmo@uva.nl	
Keywords: Gravity wave detections, coordination in transient events, FRBs, pulsars	

Session	Number of slots
J09	6
The Impact of Radio Astronomy on Technology and Society	
Conveners: Richard Schilizzi, Leonid Gurvits, Ken Kellerman, Richard Wieblinski	
Convener Emails: Richard.Schilizzi@manchester.ac.uk, lgurvits@jive.eu, kkellerm@nrao.edu, wielebinski36@t-online.de	
<p>This session is being organised by the URSI-IAU WG on Historical Radio Astronomy and will comprise invited talks and contributed posters that focus on a number of the developments and inventions in the history of radio astronomy that have directly or indirectly impacted society. The invited talks will cover The story of Wi-Fi; VLBI, navigation and geodesy; Radio interferometry and medical imaging; Cold-war diplomacy and related activities at Jodrell Bank Observatory; Deep space navigation; and Parkes and Apollo 11. Posters are welcomed on these topics as well as others that fit within the subject of the session.</p> <p>The invited talks and speakers (all have accepted) are:</p> <ol style="list-style-type: none"> 1) The Story of Wi-Fi - David Skellern (RoZetta Institute, Sydney) 2) VLBI, Navigation, and Geodesy - Megan Johnson (USNO) 3) Cold-war diplomacy at the Jodrell Bank Observatory – Simon Garrington and Tim O’Brien (JBCA) 4) Radio Interferometry and Medical Imaging – Ilana Feain (CASS) 5) Deep Space Navigation – Les Deutsch (JPL) 6) Parkes and Apollo 11 - Jasper Wall (UBC) 	

Session	Number of slots
J10	12
Latest news and observatory reports	
Conveners: Richard Bradley, Douglas Bock	
Convener Emails: rbradley@nrao.edu, douglas.bock@csiro.au	
This session will retain the traditional reports from the observatories. In addition, it will include a section for the latest news / results - allowing for very brief, last minute presentations.	

Session	Number of slots
J11	12
Big Data: Algorithms and Platforms	
Conveners: Stefan Wijnholds, Maxim Voronkov, Urvashi Rau, Gregory Hellbourg	
Convener Emails: wijnholds@astron.nl, maxim.voronkov@csiro.au, urvashi.rau@gmail.com	
<p>Given the ever increasing data volumes produced by current and future radio interferometers (LOFAR, ASKAP, SKA, ngVLA, ...), radio astronomy has entered the Big Data era. New data processing methods need to be developed that effectively exploit the capabilities of new hardware technologies to keep up with the deluge of data. At the same time, developments in hardware technologies permit to develop a highly optimized high-throughput end-to-end pipeline for near real-time flagging, calibration and imaging with very large-N radio interferometer arrays (thousands of antennas) such as the 2000-element Deep Synoptic Array (DSA-2000) as well as Phase 2 of the Square Kilometre Array (SKA) as recognised by the Radio Camera Initiative (RCI) as well as current instruments such as LOFAR, MWA, EVLA, ALMA, MeerKAT, ASKAP and GMRT where there is an ever increasing need for higher throughput data analysis and automation.</p> <p>This session aims to provide a forum to present and discuss the (co-)development of algorithms and computing platforms to deal with the Big Data challenges posed by current and future radio astronomical instruments. It intends to cover a broad range of astronomical applications, including (but not limited to):</p> <ul style="list-style-type: none"> - calibration and imaging algorithms at scale (designing scalability into the algorithms, adapting existing algorithms to new frameworks, etc.); - real-time analysis for transient science, pulsars, RFI excision, SETI (voltage streams and in-correlator, handling algorithms at high data rates); - pipeline operations, algorithm automation and HTC (the concept of science-ready-data-products and what it takes); - software paradigms and compute frameworks (optimised code on dedicated hardware versus generic high-level code and cloud platforms) 	

Session	Number of slots
J12	
Open session	
Conveners: Richard Bradley, Douglas Bock	
Convener Emails: rbradley@nrao.edu, douglas.bock@csiro.au	
The session will host papers that do not adequately fall in the other topics of commission J.	

Session	Number of slots
J13	12
Calibration techniques and instrumentation for observational cosmology	
Conveners: Nima Razavi-Ghods, Raúl Monsalve	
Convener Emails: nima@mrao.cam.ac.uk, rmonsalve@ucsc.cl	
<p>The past two decades have seen an emergence of low-frequency radio cosmology instruments, including large interferometers such as the SKA and HERA. Whilst all these instruments have somewhat different science goals, they have similar design challenges, which include the optimisation of the antenna and analogue front-ends to maximise the instrumental sensitivity.</p> <p>Other more compact instruments are designed to measure the “global” 21cm signal from primordial hydrogen, such as EDGES. These instruments rely on very high quality components and rigorous absolute calibration methods to enable them to reach the required sub-Kelvin accuracy. The technologies being developed in these fields must be aided by state-of-the-art data analysis techniques for optimal calibration and extraction of the science from observations. The focus of this session is on instrumentation and calibration of existing and upcoming radio cosmology instruments.</p>	