

16th ASRC Detailed Program

Monday - Stream 1 (Storey Hall main theatre)

| Time | Speakers Name | Title |
|------------------------------------|---|---|
| 7:45-9:00 | Registration | |
| 9:00-9:10 | Iver Cairns, Wayne Short | Welcome to ASRC |
| 9:10-9:20 | <i>Acting Vice Chancellor, Professor Paul Gough</i> | Welcome to RMIT University |
| Plenary Session I | | CHAIR: Iver Cairns |
| 9:20-9:50 | Prof Frances Bagenal, University of Colorado | Exploration of the Outer Solar System: New Horizons at Pluto and Juno at Jupiter |
| 9:50-10:20 | Dr Gordon J. Frazer, DST Group | Wide field-of-view sensing for surveillance-of-space |
| 10:20-10:50 | Dr Robert Norman, RMIT University | RMIT SPACE Research Centre – overview of past and present research endeavours |
| 10:50-11:15 | Morning Tea | |
| National Context | | CHAIR: Russell Boyce |
| 11:15-11:30 | John Le Marshall | Earth Observation from Space (Bureau of Meteorology) |
| 11:30-11:45 | Ben Greene | SERC |
| 11:45-12:00 | Mark Todd | DIIS (Civil Space, Cyber Security and ICT) |
| 12:00-12:15 | Kirco Arsov | BoM Space Weather Services |
| 12:15-12:30 | Nick Stacy | DST Group |
| 12:30-12:45 | Alice Gorman | SIAA / IAC2017 |
| 12:45-13:00 | Russell Boyce | NCSRS |
| 13:00-14:00 | Lunch | |
| Space Engineering: Cubesats | | CHAIR: David Lingard |
| 14:00-14:15 | Andrew Dempster , UNSW Australia | Evaluation of Current and Projected CubeSat Propulsion Technologies for Navigating Cislunar Space |
| 14:15-14:30 | Angus Muffatti, RMIT | Multi-objective Design Optimisation of a small scale Cusped Field Thruster for micro satellite platforms |
| 14:30-14:45 | Prof Christine Charles, ANU | Plasma experiments in the laboratory and space: the emerging role of 'CubeSat' nano-satellites and miniaturised propulsion systems. |
| 14:45-15:00 | Roger Dudziak, UNSW Canberra | Passive Thermal Control System for CubeSats |
| 15:00-15:15 | Dr Li Qiao, UNSW Canberra | Knowledge exploration for CubeSat design trade space using multi-dimensional scaling and clustering |
| 15:15-15:30 | Dr Andrew Wabnitz , DST Group | SpaceLink: A Lightweight, Robust and Secure Communication Link for Small Satellites |
| 15:30-15:45 | George Coulloupas, RMIT University | A Systems Engineering Approach to Miniaturised Satellite Constellation Design Optimisation |
| 15:45-16:00 | Victor Lim, RMIT University | Optimising the launch, deployment and performance of a smallsat constellation |
| 16:00-16:30 | Afternoon Tea | |
| Cubesats | | CHAIR: Christine Charles / Jason Held |
| 16:30-16:50 | Dr David Lingard , DST Group | Australian Participation in the Biarri CubeSat Missions |
| 16:50-17:10 | Dr Douglas Griffin, UNSW Canberra | DST Group and UNSW Canberra Buccaneer Programme Status and Plans |
| 17:10-17:30 | Dr Matthew Tetlow, Inovor Technologies | The SUSat QB50 mission |
| 17:30-17:50 | Prof Andrew Dempster, ACSER, UNSW Australia | Updates and progress of UNSW-EC0 Cubesat |
| 17:50-18:10 | Prof Iver Cairns, University of Sydney | The INSPIRE-2 / AU03 Cubesat for the QB50 Project |
| 18:30-21:30 | ASRC Gala Dinner | |

Monday - Stream 2 (Conference Rooms 1/2)

| Time | Speakers Name | Title |
|--|--|---|
| Space & Atmospheric Physics | | <i>CHAIRS: Fred Menk/Robert Norman</i> |
| 14:00-14:15 | Dr Alina Donea, Monash University | Far side imaging of the Sun for space weather prediction: how many active regions do we miss? |
| 14:15-14:30 | Ms Samira Tasnim, University of Sydney | A generalized equatorial model for the accelerating solar wind |
| 14:30-14:45 | Dr Dave Neudegg, Space Weather Services, BOM | Long term median foF2 variations in the Antarctic polar cap and the competing effects of solar EUV, magnetospheric precipitation and ionisation transport |
| 14:45-15:00 | Dr Melrose Brown, UNSW Canberra | Low Earth Orbit interaction with the atmosphere |
| 15:00-15:15 | David Netherway, DST Group | Measured and Predicted Power Received via HF Ionospheric Propagation |
| 15:15-15:30 | Miss Julie Currie, University of Newcastle | Relationship between HF radar spectral broadening and field aligned currents |
| 15:30-15:45 | Mr Kehe Wang , Space Weather Services, BOM | The Metadata Development of Space Weather Services and a Proposal of a United Australian Space Research Metadata Portal |
| 15:45-16:00 | Dr Anne Unewisse, DST Group, Edinburgh | Imagers for Ionospheric Airglow Observations |
| 16:00-16:30 Afternoon Tea | | |
| Indigenous Sky Knowledge | | <i>CHAIR: Alice Gorman / Ann Cairns</i> |
| 16:30-16:45 | Edoardo Tescari, University of Melbourne | Exploring Indigenous Astronomical Knowledge in Australia and Central America: A Cross-Cultural Collaboration |
| 16:30-17:00 | Dr Duane W. Hamacher, Monash University | How Torres Strait Islanders "Read" the Twinkling of Stars to Predict Weather |
| 17:00-17:15 | Karlie Noon, University of Newcastle | Australian Indigenous uses of Moon Haloes to Predict Weather |
| 17:15-17:30 | Carla B. Guedes, UNSW Australia | Australian Indigenous Traditions of the Moon and its Relationship to Women |
| 17:30-17:45 | Trevor M. Leaman, UNSW Australia | Sacred Celestial Landscapes: Were Wiradjuri Cultural Sites also used as Astronomical "Observatories"? |
| 17:45-18:00 | Robert S. Fuller, UNSW Australia | The astronomy of the Aboriginal peoples of the Sydney Basin |

Monday - Stream 3 (Seminar Rooms 1/2)

| Time | Speakers Name | Title |
|--------------------------|---|--|
| 13:00-14:00 Lunch | | |
| Planetary Science | | <i>CHAIR: Graziella Caprarelli</i> |
| 14:00-14:15 | Dr Kurt Liffman, Swinburne University | A Unified Framework for Producing CAI Melting, Wark-Lovering Rims and Bowl-Shaped CAIs |
| 14:15-14:30 | Miss Emily Jessica Bathgate, UTS | Raman, SEM and EPMA analyses of Australian eucrites |
| 14:30-14:45 | Jack Soutter, USQ | The Long-Term Stability of the Known Neptune Trojans |
| 14:45-15:00 | Dr Lucyna Kedziora-Chudczer, UNSW Australia | Auroral emissions of Jupiter |
| 15:00-15:15 | Dr Jerome Daquin, RMIT University | Heterogeneous Multiscale Methods for the mean orbital motion: a discussion |
| 15:15-15:30 | Dr Franklin Mills, ANU | Simulations of time-of-day variability of SO2 on Venus |
| 15:30-15:45 | A/Prof Jonti Horner, USQ | Towards the Exo-Earth Era - a Dedicated Australian Exoplanet Observatory |
| 15:45-16:00 | Prof Jeremy Bailey, UNSW Australia | How did we discover what planetary atmospheres are made of? |

Tuesday - Stream 1 (Storey Hall main theatre)

| Time | Speakers Name | Title |
|---|---|--|
| 8:00-9:00 | Registration | |
| Plenary Session II | | <i>CHAIR: Russell Boyce</i> |
| 9:00-9:30 | Prof Kathleen Campbell, University of Auckland | Astrobiology of Hot Springs on Early Earth and Mars |
| 9:30-10:00 | Dr Peter May, Bureau of Meteorology | Earth Observations from Space: Critical information used by the Bureau for national benefit |
| 10:00-10:30 | Dr Bradley Evans, University of Sydney | Leveraging "Big Environmental Data" for Modelling Ecosystem Production in Space and Time |
| 10:30-11:00 | Morning Tea | |
| Remote Sensing and GNSS | | <i>CHAIR: Bradley Evans</i> |
| 11:00-11:15 | John Le Marshall, Bureau of Meteorology | Recent and Impending Advances in the Use of Earth Observations from Space for Numerical Weather Prediction |
| 11:15-11:30 | Dr. Graham Dorrington, School of Engineering | On the Feasibility of Nanosats for Early Bushfire Detection |
| 11:30-11:45 | Ruken Alac Barut, UNSW | Analysing Post-Seismic Deformation of Izmit Earthquake with InSAR, GNSS AND Coulomb Stress Change Modelling |
| 11:45-12:00 | Prof. Stuart John Anderson, University of Adelaide | Space-borne interception of HF radar echoes for environmental intelligence |
| 12:00-12:15 | Dr. German Olivares-Pulido, CRCSI | CRCSI Project 1.21: Ionospheric Modelling |
| 12:15-12:30 | Dr. Kirco Arsov, Bureau of MEteorology | High accuracy ionospheric modelling to support GNSS positioning and navigation in Australia |
| 12:30-12:45 | Prof Kefei Zhang, RMIT University | An Advanced Near Real-Time Water Vapour Platform for Severe Weather and Climate Studies |
| 13:05-14:00 | Lunch | |
| Space & Atmospheric Physics II | | <i>CHAIR: Brett Carter</i> |
| 14:00-14:15 | Dr Zahra Bouya, Space Weather Services, Bureau of Meteorology | The Australian Region Ionospheric Maps |
| 14:15-14:30 | Mr Andrew Heitmann, DST Group, Edinburgh | Parameterised modelling of travelling ionospheric disturbances using angle-of-arrival observations on oblique HF propagation paths |
| 14:30-14:45 | Dr Kenneth J.W. Lynn, Ionospheric Systems Research | Descending Intermediate layers/Descending Sporadic E |
| 14:45-15:00 | | |
| 15:00-15:15 | Dr Bo Li, University of Sydney | Mapping Magnetic Field Lines between the Sun and Earth |
| 15:15-15:30 | Prof Fred Menk, University of Newcastle | Role of Ultra-low Frequency Plasma Waves in Energizing Particles in Earth's Radiation Belts |
| 15:30-15:45 | Prof Iver Cairns, University of Sydney | Prediction and testing of Type II radio emission, white light images, and CME properties from the Sun to Earth |
| 15:30-16:00 | Ms Belinda Nicholson, USQ | Stars as proxies for studying the Sun's early history |
| 16:00-16:30 | Afternoon Tea | |
| 16:30-18:00 | Poster session | |
| 18:00-19:20 | Cocktail Function | |

Tuesday - Stream 2 (Conference Rooms 1/2)

| Time | Speakers Name | Title |
|--|---|--|
| 10:30-11:00 Morning Tea | | |
| Human factors | | CHAIR: Guy Murphy |
| 11:00-11:20 | Dr Rowena Christiansen, University of Melbourne | Space Medicine 101 – A Primer on What Happens to the Human Body in Space |
| 11:20-11:40 | Dr Rowena Christiansen, University of Melbourne | NASA's Human Research Program – The 33 Key Issues for Human Health and Performance in Space |
| 11:40-12:00 | Dr Tracey Sletten, Monash University | Circadian misalignment and sleep disruption during long-term analog space missions. |
| 12:00-12:20 | LCDR Luke Dixon, RAN, Future Submarine Program | Human Factors in Hostile Environments: Projecting 102 Years of experience in Australian Submarines to long haul space missions |
| 12:20-12:40 | Dr Kimberley Norris, University of Tasmania | Antarctic Behavioural Health as a Space Analogue |
| 13:00-14:00 Lunch | | |
| Space Business & Entrepreneurship | | CHAIRS: Alice Gorman / Jason Held |
| 14:00-14:20 | Mrs Melanie Revellat, Airbus | Bartolomeo – Your All-In-One Mission Service |
| 14:20-14:40 | Dr Jason Held, Saber Astronautics | Planning missions for large constellations |
| 14:40-15:00 | Troy McCann, Melbourne University | Growing Australia's Space Sector |
| 15:00-15:20 | Ian Whitchurch, Neumann Space | The Barsoom Express : Earth orbit to Mars orbit in three months by solar electric propulsion |
| 15:20-15:40 | Ivan Voropaev, Wave Power Engineering Pty Ltd | Satellite electric drive |
| 15:40-16:00 | | |

Tuesday - Stream 3 (Seminar Rooms 1/2)

| Time | Speakers Name | Title |
|---|---|---|
| 13:00-14:00 Lunch | | |
| Education, Outreach & Ethics | | CHAIRS: Lachlan Thompson / Jeremy Bailey |
| 14:00-14:15 | Dr Tanya Hill, Melbourne Planetarium | The planetarium – connecting the public to current space research |
| 14:15-14:30 | Lachlan Thompson, Mount Burnett & Emerald Observatory | New Capability for Emerald & Mount Burnett Observatories, Victoria for Earth Situational Awareness, Research, Education and Tourism |
| 14:30-14:45 | A/Prof Graziella Caprarelli, UniSA | The International Space University Southern Hemisphere Program |
| 14:45-15:00 | Prof Jeremy Bailey, UNSW | A Large Fully-Online Astrobiology Course |
| 15:00-15:15 | Mrs Gabriela-Nicoleta Hobbs, UNSW Canberra | The Ethics of Working with Robots |
| 15:15-15:30 | Victoria Tasker, Australian National University | Becoming cyborgs to expand humanity: will the integration of technology and humans reinforce humanity, or redefine it? |
| 15:30-15:45 | Mrs Gabriela-Nicoleta Hobbs, UNSW Canberra | Educational and Scientific Benefits of Extreme Environments |

Wednesday - Stream 1 (Storey Hall main theatre)

| Time | Speakers Name | Title |
|------------------------------------|--|---|
| 8:00-9:00 | Registration | |
| Plenary Session III | | CHAIR: Wayne Short |
| 9:00-9:30 | Upulie Diveksara, Monash University | A New Era of Space Exploration |
| 9:30-10:00 | Dr Eriita Jones, UniSA | Identifying Something Which Can't Be Seen: Holistic Methodologies In The Search For Subsurface Water on Mars and Other Planets. |
| 10:00-10:30 | Dr. Douglas Griffin, UNSW Canberra | The Engineering of Space Flight Programmes in the Australian Context: a sustainable model |
| 10:30-11:00 | Morning Tea | |
| GNSS | | CHAIRS: John LeMarshall / Kefei Zhang |
| 11:00-11:15 | Arunkumar Rathinam, ACSER, UNSW | Prospects for Multi-GNSS for Space Service Volume |
| 11:15-11:30 | Francesco Cappello, RMIT University | GNSS Attitude Determination and Control for Space Transportation Applications |
| 11:30-11:45 | Dr Zishen Li, RMIT University | Towards a Two-Layer Ionospheric Delay Model for Real-time Single-frequency PPP over Australian Region |
| 11:45-12:00 | Changyong He, SPACE Research Centre, School of Science, RMIT | Comparison of atmospheric mass density models and their impact on the orbit propagation of low Earth orbit satellites |
| 12:00-12:15 | Changjiang Hu, UNSW Canberra | Contemporary Space-based GNSS Remote Sensing |
| 12:15-12:30 | Francesco Cappello, RMIT University | Navigation and Guidance Systems for Space Transportation Applications |
| 12:30-12:45 | Subramanian Ramasamy, RMIT University | Design and Development of Communication System for Unmanned Reusable Space Vehicles |
| 13:00-14:00 | Lunch | |
| Space Engineering | | CHAIRS: Andrew Dempster / Lily Qiao |
| 14:00-14:15 | Mr Garland Hu , DST Group | Modular and Reusable Flight Software Design for the Buccaneer Risk Mitigation Mission |
| 14:15-14:30 | Ms Natalie Olsen , DST Group | Ground Segment Software Design and Development for the Buccaneer Risk Mitigation Mission |
| 14:30-14:45 | Simon Barradough, UNSW Canberra | Assessment and Verification of the Thermal Performance of the BRMM Spacecraft |
| 14:45-15:00 | Dr Giuseppina Dall'Armi-Stoks, DST Group | Computational Electromagnetic Modelling to Support Spacecraft Design |
| 15:00-15:15 | Prof Roberto Sabatini, RMIT University | Overview of the ISS Columbus module avionics |
| 15:15-15:30 | Mr Subramanian Ramsamy, RMIT University | Avionics Systems for Unmanned Reusable Space Vehicles |
| 15:30-15:45 | Mr Yi Xiang Lim, RMIT University | Cognitive Human Machine Interface for the Ground Pilot Station of an Unmanned Reusable Space Vehicle |
| 15:30-16:00 | Prof. Michael Smart, University of Queensland | Flyback booster for dedicated launch of small satellites |
| 16:00-16:20 | Afternoon Tea | |
| Space Situational Awareness | | CHAIR: Melrose Brown |
| 16:20-16:35 | Brenton Smith, UNSW Canberra | The Impact Of Lift And Drag On 6D of Motion Of Leo Objects : Formation Control And Debris Behaviour |
| 16:35-16:50 | Adam Harris, RMIT University | An analysis of short-arc orbit determination for Low Earth Orbit objects comparing batch and Kalman Filter methods |
| 16:50-17:05 | Andoh Michael Afful, RMIT University | Space Object Characterisation - A Case for Ballistic Coefficient Estimation |
| 17:05-17:20 | Dr Yang Yang, RMIT University | Schmidt-Kalman Filter and its Applications to Orbit Determination of Space Objects |
| 17:20-17:35 | Dr Florent Deleflie , IMCCE (Celestial Mechanics Institute) @ Paris Observatory (France) | Atmospheric reentry prediction for artificial satellites from TLE time series and precise orbit determination |
| 17:35-17:50 | Dr Jerome Daquin, RMIT University | Stability, chaos and transport in Earth orbits |
| 17:50-18:00 | Iver Cairns, Wayne Short | Closing remarks |
| 18:30-20:00 | MSA "David Cooper memorial lecture" by Dr James Waldie | Public talk (level 2): From the outback to the space station: developing revolutionary spacesuits with NASA and ESA |

Wednesday - Stream 2 (Conference Rooms 1/2)

| Time | Speakers Name | Title |
|--|---|---|
| 10:30-11:00 | Morning Tea | |
| Space & Atmospheric Physics 3 | | CHAIR: Zahra Bouya |
| 11:00-11:15 | Lenard Pederick, DST Group | Observations of Travelling Ionospheric Disturbances with a Network of Quasi-Vertical Incidence Sounders in the Alice Springs region |
| 11:15-11:30 | Dr Brett Carter, RMIT University | Geomagnetically induced currents around the world during the 2015 St. Patrick's Day storm |
| 11:30-11:45 | Prof Colin Waters, University of Newcastle | Global magnetic signature of the 2015 St Patricks day geomagnetic storm |
| 11:45-12:00 | Mr Ronald Maj, University of Sydney | Quasi-thermal Noise Spectroscopy on a Cubesat in Earth's Ionosphere |
| 12:00-12:15 | Mr Christopher Capon, UNSW Canberra | Ionospheric Wake Modelling for Improved Resident Space Object Detection |
| 12:15-12:30 | Dr Anne Unewisse, DST Group | Airglow Observations from ELOISE |
| 12:30-12:45 | Dr Jeanne Young , Space Weather Services, Bureau of Meteorology | New Space Weather Services products using observations of the Earth's magnetic field and their relevance to the user community |

Wednesday - Stream 2 (Seminar Rooms 1/2)

| Time | Speakers Name | Title |
|--------------------------------------|---|--|
| 13:00-14:00 | Lunch | |
| Mars | | CHAIR: Lucyna Chudzer-Kedziora / Jonti Horner |
| 14:00-14:15 | Danielle Shean, VSSEC | Created Mars analogues as effective tools for learning |
| 14:15-14:30 | Dr Graziella Caprarelli, UniSA | It was a dark and stormy night in Lunae Planum. |
| 14:30-14:45 | Dr. Helen E. A. Brand, Australian Synchrotron | In Situ studies of Jarosite Formation: From Tasmania to Mars |
| 14:45-15:00 | Dr Steven Hobbs, UNSW Australia | A4 Rover: First Build to Initial Field Trials of a Small Planetary Science Rover for Mars Surface Exploration |
| 15:00-15:15 | Dr Eriita Jones, UniSA | Inferring the presence of subsurface water on Mars from surface ejecta grain size. |
| 15:15-15:30 | Dr Graham Dorrington , RMIT University | Rationale and Strategies for Reconnaissance of Lunar and Martian Pit-Voids |
| 15:30-15:45 | Dr Steven Hobbs, UNSW Australia | Hands Off Field Work: Comparison of Human and Robotic Methods for Gathering Terrain Data using Structure From Motion |
| 15:30-16:00 | Dr Craig Benson, UNSW Canberra | A Southern Hemisphere Planetary Radar Demonstration |
| 16:00-16:20 | Afternoon Tea | |
| Space Missions & Projects | | CHAIR: Graham Dorrington |
| 16:20-16:35 | Igor Dimitrijevic, UNSW Canberra | Buccaneer Risk Mitigation Mission Assembly, Integration and Verification Programme |
| 16:35-16:50 | Dr Anthony John Horton, Australian Astronomical Observatory | The Australian Space Eye: a CubeSat to study the history of galaxy formation |
| 16:50-17:05 | Igor Rozenberg, Space Association of Australia | Russian New Generation "Federation" Crewed Spacecraft Project Status |
| 17:05-17:20 | Mr Sanat Biswas, UNSW Australia | Position and Velocity estimation of Re-entry Vehicles using Fast Unscented Kalman Filters |
| 17:20-17:35 | Rohan Kapoor , RMIT University | Modelling a Rendezvous to Comet Hartley 2 around its Perihelion |
| 17:35-17:50 | Mr Yang Zhao, RMIT University | New Methods for Improving Two-line Element Outlier Detection Based on a Consistency Check |
| 17:50-18:00 | Iver Cairns, Wayne Short | Closing remarks (Level 5) |