

21ASRC Detailed Program

Monday – Shared (Stanley Burbury Theatre)

Time	Speakers Name	Title
7:45-8:45	Registration	
8:45-9:30	Iver Cairns, Wayne Short Simon Ellingsen, Hon. Madeleine Ogilvie, Tasmanian Minister for Science and Technology	Welcome to the ASRC
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Plenary Session – Science		
9:30-10:00	Dr Ed Kruzins, UNSW Canberra	Southern Hemisphere Optical/Radar Detection of Near Earth Asteroids
10:00-10:30	Dr Anna Wang, UNSW Sydney	Building protocells to understand the origin of life on Earth
10:30-11:00	Professor Martin van Kranendonk, UNSW Sydney	LifeSpringsMars: A new sample return mission concept to search for ancient life on Mars
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11:00-11:30	Morning Tea	
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National Context		
11:30-12:00	Professor Paulo de Souza, Griffith University	STEM Program About Space Exploration (SPASE)
12:00-12:30	Dr Elyse Allender, Australian Space Agency	Connecting Australian Space Science and Exploration to the World
12:30-13:00	Professor Phil Bland, Curtin University	A National Space Science Mission Program
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13:00-14:00	Lunch	
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15:30-18:15	Poster Session & Networking function	
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19:00-20:30	MSA “David Cooper memorial lecture” by A/Prof Katarina Miljkovic	What can Mars craters tell us about planetary crusts, origin of meteorites, resources and habitability?

Monday - Stream 1 (Stanley Burbury Theatre)

Time	Speakers Name	Title
13:00-14:00	<i>Lunch</i>	
Space Missions		
14:00-14:15	Craig James CSIRO	The iLAUNCH Mobile Mission Operations Centre: Advancing Australia's Sovereign Launch Capability
14:15-14:30	Iver Cairns University of Sydney	Progress Report on the Waratah Seed Pilot Space Qualification Mission
14:30-14:45	Paulo de Souza Griffith University	Bush fire detection and monitoring using space based sensors
14:45-15:00	Matthew William Auld RMIT University	Processing Lunar orbital data for signs of subsurface voids at the Lunar South pole
15:00-15:15	Guifré Molera Calvés University of Tasmania	Initial operations of the ESA Jupiter Icy Moons Explorer mission with PRIDE
15:15-15:30	Connor Langford University of Sydney	The TOLIMAN Space Telescope: A mission to detect Earth-like exoplanets around our nearest neighbours

Monday – Stream 2 (Studio Theatre)

Time	Speakers Name	Title
History, education and training		
14:00-14:15	Kerrie Dougherty Australian Space Agency	From ANCOSPAR to the Australian Space Office: early proposals for an Australian national space agency (1959-1987)
14:15-14:30	Gretchen Benedix Curtin University (VIA ZOOM)	A survey of Australian educational opportunities in Space and Planetary Science
14:30-14:45	Lorian Marshall Curtin University	BinarX: Launching High School Payloads Into Space
14:45-15:00	Gail Iles RMIT University	Undergraduate training in space situational awareness at RMIT University
15:00-15:15	Li Qiao UNSW Canberra	The Australian National Concurrent Design Facility at UNSW Canberra

**Monday - Stream 3
(Room 211, Social Sciences Building)**

Time	Speakers Name	Title
13:00-14:00	Lunch	

Space Law, GNSS, PNT		
14:00-14:15	Dr. Shea Esterling / William Grant University of Canterbury, NZ	Dark Skies and Indigenous Rights: An Aotearoa New Zealand Model
14:15-14:30	Art Cotterell University of Adelaide	Intellectual Property Law: Challenges and Opportunities for the New Space Age
14:30-14:45	Clare Fletcher UNSW Sydney	Clear and Present Danger: Understanding Risks to Outstanding Universal Geoheritage Values on Mars to Guide Proactive Policy
14:45-15:00	Syed Shahzad UNSW Sydney	Beyond Borders: Analysing International Law's Response to Cyberwarfare in Outer Space
15:00-15:15	Kenji Shimizu CSIRO	Feasibility Study of Two-Way Quantum Secured Positioning, Navigation, and Timing
15:15-15:30	David Schunck University of Tasmania	Practical Considerations for VLBI Observations to Satellites in View of the GENESIS Mission

Tuesday - Shared (Stanley Burbury Theatre)

Time	Speakers Name	Title
8:00-9:00	Registration	

Plenary Session – Space Industry and Outreach

9:00-9:30	Dr Carl Seubert, SmartSat CRC	The SmartSat Trajectory: Innovative Technologies and Industry Capability
9:30-10:00	Dr Roger Kermode, University of Technology Sydney	Space manufacturing at UTS
10:00-10:30	Dr Kimberley Clayfield, CSIRO	CSIRO and Space
10:30-11:00	Morning Tea	

Townhall Discussion

11:00-13:00	Facilitated by Iver Cairns, Brett Biddington Mangala Sharma and Phil Bland	Workshop: Australia's Space Journey: The missing link – a national narrative
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Conference Dinner

19:00-22:30	Hosted by Iver Cairns, Wayne Short Presentation by Dr Marc Duldig, Australian Antarctic Division	
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Tuesday - Stream 1 (Stanley Burbury Theatre 2)

Time	Speakers Name	Title
13:00-14:00	Lunch	

Planets

14:00-14:15	Seamus Anderson, Curtin University	Meteorite Searching Using Drones and Machine Learning
14:15-14:30	Shinji Horiuchi, CSIRO	Characterising Near-Earth Objects with the Southern Hemisphere Asteroid Radar Program (SHARP)?
14:30-14:45	Dale Giancono, Curtin University	High Temporal Resolution Observation of Lunar Impact Flashes using a Low-Cost Portable Camera System
14:45-15:00	Jeremy Bailey, UNSW Sydney	100 Years of Venus Polarimetry

Time	Speakers Name	Title
15:00-15:15	Gillian Altham, Australian National University	The Ionisation of an Ancient Venusian Atmosphere from Major Galactic Cosmic Ray Events and Their Affect on The Continuity Of Life
15:15-15:30	Katarina Miljkovic, Curtin University	Impact craters as a tool for understanding structure and evolution of planetary surfaces
15:30-16:00	<i>Afternoon Tea</i>	

Space Engineering 1

16:00-16:15	Daniel Bennett, University of Wollongong	Sensor for Displacement Damage Monitoring in GCR Space Environment
16:15-16:30	Ignatius Rivaldi, UNSW Sydney	Distributed Flatsat
16:30-16:45	Tristan Ward, Curtin University	Open-Source Success: UHF radio on Binar 2,3 and 4 CubeSats built from the open source OpenLST project
16:45-17:00	Charles Nicholas Wen Lie Morley- Wong, Curtin University	High-Altitude Balloons: CubeSat Testing at LEO on a Budget
17:00-17:15	Elisa Jager, Australian National University	Establishing the ANU Optical Communications Ground Station
17:15-17:30	Jia Du, CSIRO	Demonstration of High-Speed Real- Time Terahertz Wireless Communication link
17:30-17:45	Ravi Toor, CypherHound	Unveiling Cybersecurity Risks: Analysing Commercial CubeSat Vulnerabilities through MBSE Modelling
17:45-18:00	Shagun Aggarwal, UNSW Sydney	Assessing the Efficiency and Feasibility of Electrodynamic Tethers for LEO Applications

Tuesday - Stream 2 (Studio Theatre)

Time	Speakers Name	Title
13:00-14:00	Lunch	
In-situ resource utilisation		
14:00-14:15	Jonathon Ralston, CSIRO	Closing the Gap: Steps to Achieving In-Situ Resource Utilisation (ISRU) Capability for Future Planetary Missions
14:15-14:30	Marc Elmoultie, CSIRO	Geotechnical Monitoring for Lunar Surface Engineering
14:30-14:45	Stephen Jones, Queensland University of Technology	A Lunar regolith simulant with representative optical and strength characteristics for robotics perception and navigation
14:45-15:00	Peter M. Ireland, University of Newcastle	Lunar ice extraction – To concentrate or not to concentrate?
15:00-15:15	Deddy Chandra, Nababan CSIRO	Metals extraction from Martian regolith through carbothermal reduction: thermodynamic assessments and preliminary experiments
15:30-16:00	Afternoon Tea	
Indigenous heritage, applied space life science		
16:00-16:15	Vanessa Chapman, Jacobs and Trace Archaeology and Ecology	Preserving our Interplanetary Legacy: Integrating Heritage Conservation Practices into the Space Industry
16:15-16:30	Kaja Antleij, Deakin University	Towards the wellbeing in space: measuring and monitoring the emotions of users immersed in meaningful virtual reality experiences
16:30-16:45	Peter Padd, Fortifyedge	Astronaut Biobehavioral State Monitoring utilizing advanced neural networks at the edge
16:45-17:00	Shane P. Usher, University of Melbourne	Sustaining Life in Confined Spaces: Development of Terrestrial Research Chambers
17:00-17:15	Iain Simon Koolhof, Boeing	Anti-microbial Polymer Development for Spacecraft Cabin Disease & System Contamination
17:15-17:30	Julia Low, RMIT University	A comparison of the LET response of the SOI microdosimeter and the TimePix
17:30-17:45	Linh Tran, University of Wollongong	A comparison of the LET response of the SOI microdosimeter and the TimePix

**Tuesday - Stream 3
(Room 211, Social Science Building)**

Time	Speakers Name	Title
13:00-14:00	Lunch	

Space and Atmospheric Physics 1

14:00-14:15	Alina Donea, Monash University	A benchmark dataset of near and far-side solar maps to physics-inform machine learning and forecasting algorithms
14:15-14:30	John Morgan, CSIRO	Monitoring the Heliosphere with Australian ground-based Radio Telescopes
14:30-14:45	Jasper Edwards, University of Tasmania	Spectral broadening and phase scintillation measurements of Mars Express spacecraft radio links during the 2021 Mars solar conjunction
14:45-15:00	Iver Cairns, University of Sydney	Ion Acoustic Waves Driven by a Reactive Ion Beam Instability in Parker Solar Probe Data
15:00-15:15	Pradyumna Kummamuru, University of Tasmania	Radio sounding of Mars Express to study interplanetary scintillation and solar wind dynamics
15:15-15:30	Thimthana Lee, Australian National University	Solid Hydrocarbon Propellants for Cold-gas Thrusters: A promising Frontier

15:30-16:00 Afternoon Tea

Space Business, Remote sensing

16:00-16:15	Simon Ellingsen, University of Tasmania	Big Dishes, Big Opportunities: The University of Tasmania's Space Capabilities
16:15-16:30	Mellodee Anvia, Australian Space Agency	Developing Space Qualification Testing Facilities in Australia
16:30-16:45	Matt Shadwell, Australian National University	Developing a sublimating propellant delivery system for electrothermal thrusters
16:45-17:00	Craig Ingram, CSIRO	CyanoSat, An Australian designed and manufactured hyperspectral imager for Earth observation, design and data
17:00-17:15	Joshua Pease, CSIRO	Development, testing, and optimisation of a linear-variable filter for compact hyperspectral imaging systems in low-Earth orbit.

Time	Speakers Name	Title
17:15-17:30	Eriita Jones, Curtin University	Early Fire Smoke Detection for Bushfire Identification, by Australian CubeSat Onboard AI.
17:30-17:45	Taofiq Huq, Spiral Blue	Space Edge Computing: Unlocking the Power of AI in Space
17:45-18:00	Melanie Johnston-Hollitt, Curtin University	Unlocking Australia's Geospatial Potential: Recommendations for Streamlined Access to Earth Observation Data from the Australian Space Data Analysis Facility
18:00-18:10	<i>Iver Cairns, Wayne Short</i>	<i>Closing Remarks</i>

Wednesday - Shared (*Stanley Burbury Theatre*)

Time	Speakers Name	Title
8:15-9:00	Registration	

Plenary Session – Space Applications

9:00-9:30	Dr Jeff Ayton, Australian Antarctic Division	Antarctica as a space analogue for medical research: recent Australian contributions to human spaceflight
9:30-10:00	Dr Emma Bland, DSTG	Recent Space Weather Events and their Impacts on the Ionosphere
10:00-10:30	Dr Andrew Klekociuk, Australian Antarctic Division	Scientific Applications of Satellite Atmospheric Sounding in the Australian Antarctic Program
10:30-11:00	Morning Tea	

Conference Close

18:00-18:10	<i>Iver Cairns, Wayne Short</i>	<i>Closing remarks</i>
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Wednesday Stream 1 (*Stanley Burbury Theatre 2*)

Time	Speakers Name	Title
Mars		
11:00-11:15	Paulo de Souza, Girffith University (via ZOOM)	50 years of Exploration of Mars
11:15-11:30	Jonathan Clarke, Mars Society Australia	AUSTRALIAN impact craters as MARS analogues
11:30-11:45	Mya Ubalde, Curtin University	Blob detection of impact craters in gravity data on the Moon and Mars
11:45-12:00	Hely C. Branco, Curtin University	New insights on Mars' impact basins from numerical simulations
12:00-12:15	Gretchen Benedix, Curtin University (VIA ZOOM)	Mapping Mars using a Machine Learning derived dataset
12:15-12:30	Jonathon Ralston, CSIRO	Exploring the Martian Subsurface: Unlocking Perseverance's RIMFAX Radar Data Streams
12:30-12:45	Eriita G. Jones, Curtin University	Planetary HYdrothermal eNvironment Detector (PHYND): Initial Development On Mars and Validation On Earth
12:45-13:00	Joshua Rusby, IPAS	A new Optical Analysis Technique for the Study of Martian Moon Minerals
13:00-14:00	Lunch	

Time	Speakers Name	Title
Space Engineering 2		
14:00-14:15	Rod Boswell, Boswell Technologies	Co-operative projects between Boswell technologies and the Space Plasma Power and propulsion team at the ANU.
14:15-14:30	Justin Kin Jun Hew, Australian National University	An adaptive, parallelised in-house Direct Simulation Monte Carlo code for the simulation of under-expanded rarefied microjets
14:30-14:45	Mahdi Davoodianidalik, Australian National University	Bogong Thruster Status
14:45-15:00	Daniel Turner, Curtin University	Development and Initial Test Results of a Resistojet Thruster for a Lunar CubeSat Propulsion Module
15:00-15:15	Josef L. Richmond, Australian National University	Design and Commissioning of the Low Atmosphere Rocky Analog (LARA)
15:15-15:30	Kyle McMullan, Curtin University	Magnetic and Gyroscope Based ADCS: Pointing with Your Hands Tied Behind Your Back
16:00-16:30 Afternoon Tea		
Space Situational Awareness		
16:00-16:15	Douglas Hayman, CSIRO	Space Situational Awareness with CSIRO's Radio Telescopes
16:15-16:30	David Coward, University of Western Australia	The Birth and Evolution of the Western Australian Space Surveillance Hub
16:30-16:45	Tony Monger, University of Sydney	Refined Analyses of Space Weather Effects on the Orbit of the CUAVA-1 CubeSat
16:45-17:00	David Smith, University of Tasmania	Satellite Pattern of Life Observations and Analysis in Space Domain Awareness
17:00-17:15	Rabbia Saleem, UNSW Canberra	Machine Learning-Assisted Diverse Sensor Network for Wide Field of View Passive Radio Frequency Space Domain Awareness

Wednesday Stream 2 (Studio Theatre)

Time	Speakers Name	Title
Industry Incubator		
11:00-13:00	Facilitated by the NSW Space Research Network	David Reynolds and ???
13:00-14:00 Lunch		
Space and Atmospheric Physics 2		
14:00-14:15	Zahra Bouya, Bureau of Meteorology	Systematic assessment of ionosphere/thermosphere models during geomagnetic storms
14:15-14:30	Elise Blanchfield, RMIT University	Comparison of interpolation methods of TIE-GCM neutral and electron densities across time-of-day and latitude ranges over a geomagnetic storm
14:30-14:45	Vickal Vikash Kumar, Bureau of Meteorology	An adaptive filter for selecting real-time ionospheric observations for data assimilation: A case study with COSMIC-2 and ionosonde observations
14:45-15:00	Stuart Anderson, University of Adelaide	Ionospheric sounder observations of the shock wave from a large ground-based explosion – revisited
15:00-15:15	Tejaswi Shinde, University of Sydney	Modelling of Electric Thruster-Spacecraft Interaction at Jovian and Saturnian Magnetosphere
15:15-15:30	Justin Kin Jun Hew, Australian National University	Numerical analysis of viscous effects on transition of centreline shock reflection
16:00-16:30 Afternoon Tea		
Space Engineering 3		
16:00-16:15	Ming Xin Jeannie Ng, RMIT University	A 1U scale model of an electromagnetic shield for the protection of crew against space radiation
16:15-16:30	Samuel William Spencer Cox, RMIT University	Validation of Monte-Carlo Simulated Electron Particle Deflections using Cathode Ray Tubes
16:30-16:45	Thierry Peynot, Queensland University of Technology	QUT's Large Lunar Testbed and Space Robotics Facility
16:45-17:00	Li Qiao, UNSW Canberra	Smart Design for Space Systems Engineering: Insights from AI/CI Applications in Data-Driven Decision Making

Time	Speakers Name	Title
17:00-17:15	Mei Gao, CSIRO	Rollable Perovskite Solar Cells for Space Applications
17:15-17:30	Gavin Conibeer, UNSW Sydney	Cheap high efficiency tandem solar cells for space applications
17:30-17:45	Juengeun Kim, CSIRO	Demonstration of Stable, Light-Weight and Highly Efficient Flexible Perovskite Solar Modules via Fully Vacuum-Free Roll-to-Roll Processes for Space Applications
17:45-18:00	Budhaditya Majumdar, UNSW Sydney	Novel actuation techniques for precision steering of a mirror for satellite optics
18:00-18:10	<i>Iver Cairns, Wayne Short</i>	<i>Closing Remarks</i>

Poster Presentations

The presenters at the poster session on Monday September 25 are:

Kathiravan Thangavel (Akula Tech Pty Ltd):

Continuous on-board machine learning with human-in-the-loop for hyperspectral imaging satellites

Claudia Gonzalez Viejo (University of Melbourne):

Changes in sensory perception in space using simulating microgravity reclining positions: A preliminary study to understand food perception in long-term space explorations

Sigfredo Fuentes (University of Melbourne):

Exploring Consumers' Biometrics and Acceptability of Pick-and-Eat Leafy Greens Produced in Small-Scale Robotic Farming Systems in Space-Simulated Conditions

Michael Loong-Siong Wong (University of Sydney) :

Biomonitoring for human spaceflight: a review of historical terrestrial & spaceflight applications

Jane Hodgkinson (CSIRO):

Projecting the digital lunar landscape for space exploration

Shinzo Tanimoto (Griffith University):

Design Considerations of a Spherical Robot for Martian Surface Exploration

Stuart Anderson (University of Adelaide):

Considerations in the design of skywave radars for environmental monitoring on Mars

John Hugh Fairweather (Curtin University):

Using a Machine Learning Algorithm to Map the Entire surface of the Moon

Ashley Rogers (Curtin University):

Tracking Solar System evolution with geochemical studies of ungrouped iron meteorites

Jake Maughan (Curtin University):

Feasibility of sampling surface of an asteroid from orbit

Annabelle Nshuti (Australian National University):

A photochemical model of the coupled oxygen system (O₂-O₃-OH) in Venus' mesosphere (90 – 110 km)

Franklin Mills (Australian National University):

Modelled Impact of Variable Clouds and Hazes on Radiation and Photochemistry in Venus' Mesosphere

Jeremy Bailey (UNSW Sydney):

Europa: Probing the Icy Surface of an Ocean World

Eriita G. Jones (Curtin University):

The Critical Role of Evapotranspiration Products For the Sustainable Use of Australia's Water Resources and Future Climate Readiness.

Jared Waterman (University of Adelaide):

Development and validation of on-board processing algorithms for the CyanoSat hyperspectral imager.

Craig Ingram (CSIRO):

Freeform Wide field-of-view Imaging Telescope for Earth Observation: Design and Demonstration

Vasily Lobzin (Bureau of Meteorology):

A New Model for Predictions of Relativistic Electron Flux and Fluence at Geo-Synchronous Orbit

Vasily Lobzin (Bureau of Meteorology):

Annual Occurrence Statistics and Probabilities for NOAA and ASWAS Scales

Nishq Ravindranath (Akula Tech Pty Ltd):

Advancing inter-satellite communication for efficient constellation management: Design, performance, and applications of small satellite inter-satellite communication modules

Kenyon McMahon (Australian National University):

Optimisation of low-thrust orbit raising from 250 km to 550 km with Hall Effect thruster

Gavin Conibeer (UNSW Sydney):

Zero or low fuel methods of spacecraft propulsion

Lauren Springer (Australian Space Agency):

Team Artemis Australia: Australia's role in Supporting Global Space Exploration Endeavours

Leigh Tyers (Curtin University):

Meteor Entry Tracking using the Earth Observation Record: An Analysis of Fireball Events using the Himawari 8 & 9 Geostationary Satellites

Li Qiao (UNSW Canberra):

Australian Owned Satellite Database: Updates and Visualisation

Sophie Deam (Curtin University):

Characterising the near-Earth object population using the Global Fireball Observatory