SMARTSATNEWS

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SMARTSAT COOPERATIVE RESEARCH CENTRE

Australian Government
Department of Industry, Science, Energy and Resources

Business Cooperative Research Centres Program

Contents

Front image: The new Western Australian Optical Ground Station (WAOGS) at the UniWA Campus in Perth

Message from the CEO

Prof Andy Koronios

Chief Executive Officer

Dear colleagues

Welcome to the first edition of the SmartSat newsletter for 2021. This year is already proving to be an exciting time for SmartSat and the broader space industry. As COVID-19 restrictions are gradually lifting, we have been enjoying increased face to face interactions with our partners and the opportunity to attend some industry events around the country.

Our SmartSat Team is growing with talent that promises to build formidable capability in our research and innovation activity and will no doubt accelerate our work in helping build Australia's space industry. Dr Danielle Wuchenich has kindly accepted the role as a Non-Executive Director on the SmartSat Board, Dr Carl Seubert, a Senior Aerospace Engineer at NASA Jet Propulsion Laboratory (JPL) has been appointed as our Chief Research Officer (an Aussie returning home!). Dr Andrew Barton and Craig Williams have commenced their roles as Research Program Managers. We are truly excited to have such talent-boosting appointments at SmartSat.

We have now approved over 40 projects and awarded 24 PhD scholarships and are continuing to accelerate our industry engagement and research activities. We are working towards developing large, high impact projects that align with our End-user Sector Plans and mission priorities. I encourage all partners to reach out to the SmartSat team to discuss potential project ideas.

State governments are demonstrating their confidence in SmartSat by making additional investments in state nodes and satellite missions; Last week we were delighted to launch the NSW SmartSat Node and we were recently asked by the SA Government to lead their $6.5 million SASAT1 mission, meanwhile the Victorian Government has also recently approved funding for a SmartSat Node, details to be announced soon.

I would like to thank all of you for your continued commitment and support of SmartSat and I look forward to working with you to achieve even greater things in 2021.

Andy

"Last week we were delighted to launch the NSW SmartSat Node and we were recently asked by the SA Government to lead their $6.5 million SASAT1 mission, meanwhile the Victorian Government has recently approved funding for a SmartSat Node, details to be announced soon."

Comms & Outreach

Adj Prof Nicola Sasanelli

Director, Communication and Outreach

Dear Colleagues

We have had a very positive start to 2021, with several exciting announcements and successful events in the first quarter. This year we hope to continue delivering a range of initiatives that will encourage collaboration and knowledge sharing amongst our community and I encourage you to participate in as many activities as possible.

We have hosted two Distinguished Speaker lectures this year, firstly in February, Prof Ashish Mahabal Astronomer and Lead Computational and Data Scientist (CalTech) and secondly in March, Dr Larry D James, Deputy Director, NASA Jet Propulsion Laboratory. Both of these speakers offered very engaging presentations on their cutting-edge fields of research, which are detailed in the event section of this newsletter. In the next few months we will be arranging a lecture from Dr Alice Bunn of the UK Space Agency and continuing the industry webinar series.

On the news front, the announcement of the SASAT1 project generated a lot of media coverage and excitement. We will continue to provide regular updates on this project as it progresses. It was also exciting so see such a strong turnout of space industry colleagues and the media at the NSW Node launch event, and we look forward to similar events in other states in the coming months.

One of SmartSat's key outreach objectives is to inspire young people to pursue a career in space. On that note, I would invite you to participate in the National Storytime in Space campaign, which calls on adults to read a book to a special child in their life. Reading aloud to a 4-5 year-old child daily can advance their reading skills by more than a year, with consequent improvements in their overall learning capability. I hope you will join me in participating.

On a final note, we look forward to seeing our SmartSat and space industry colleagues at the 11th Australian Space Forum at the Adelaide Convention Centre on March 31. The Forum will feature expert panels on building a national space science education and outreach, the importance of advanced manufacturing and quantum engineering and communication in space based applications. SmartSat will be hosting a booth in the Exhibition along with the Aurora Space Cluster – we encourage you to come and say hello and find out more about our initiatives!

Nicola

"One of SmartSat's key outreach objectives is to inspire young people to pursue a career in space. On that note, I would invite you to participate in the National Storytime in Space campaign, which calls on adults to read a book to a special child in their life. Reading aloud to a 4-5 year-old child daily can advance their reading skills by more than a year, with consequent improvements in their overall learning capability. I hope you will join me in participating."

Industry

Peter Nikoloff

Director, Industry Advisory Board

South Australian Space Mission

The year was kicked off with an incredible announcement by the South Australian Premier Steven Marshal for a $6.5 million ground-breaking space mission. The Marshall Government is partnering with the South Australian space industry to send a locally manufactured small satellite to low Earth orbit. The information gathered by the satellite will boost South Australia's space economy, as well as helping to improve state services such as emergency services, the environment, water quality monitoring, mining and bushfire mitigation. SmartSat CRC will lead the mission and application prototyping, with satellite manufacturing

company Inovor Technologies designing and building the satellite and Myriota contracted for the Internet of Things (IoT) space services.

The End User Advisory Boards released the one-page Sector Priorities for Agriculture and Natural Resources, Mining and Energy, and Defence and National Security in Dec 2020. These have now been followed up by the full version report for release in March. These valuable reports are already making an impact and being used by SmartSat Exec, Research Team, and the Board Research Investment Committee as well as partners to help guide project development and approval.

We have just released the 2021 SmartSat Partner Surveys (previously called the Expectation Survey) and invite all partner organisations to participate in. This survey gives partner organisations the opportunity to set out expectations and identify areas of interest for project and capability development, research, and collaboration. SmartSat will use this information to help map our partners against our technology road map and strategies. This will significantly contribute to bringing partners together in building strong relationships and projects. Sarah Cannard (Deputy Industry Director) and I will follow up to see how everyone is going and expand on the survey key topics.

In support of the Australian Space Agency's Demonstrator Moon to Mars grants, the Industry Directors have developed a series of webinars aims at educating the space industry in what it takes to put a payload and spacecraft into orbit. The second webinar, held in March, gave an overview of the Regulatory Requirements from an industry/end-user perspective. Future webinars will delve deeper into the challenges of the Space Environment, Systems Engineering, Test and Evaluation (space qualification), and Spacecraft Operations.

Peter Kerr

Coordinator: Defence and National Security

2030 Space and Spatial Industry Growth Roadmap

SmartSat CRC continues to play a lead role in this important national endeavour aimed at identifying pathways for industry growth at the intersection of our national space and spatial information sectors.

We are partnering with stakeholders including industry associations, government agencies, research organisations and the Australian Space Agency to help shape these critical sectors over the next 10 years.

The roadmap development is being overseen by a Steering Committee and supported by a Working Party, both featuring strong representation from SmartSat CRC and our partner organisations, and is about to enter an important consultation phase.

This will be done through two stages, starting in March and concluding a few months later.

Input from the consultation will help finalise a Space and Spatial Industry Growth White Paper and the 2030 Space and Spatial Roadmap before the end of this year.

Stay tuned to our website, 2030spaceandspatial.com which will be updated throughout the consultation process and continuing roadmap development.

Research

Dr Allison Keally

Acting Chief Research Officer

The February Board meeting approved two new projects, including one of our first projects to transition succesfully from Phase One to Phase Two.

Coherent Free-Space Optical Communications

This project will contine to be lead by Dr Sashcha Schediwy of University of Western Australia and also includes Defence Science and Technology Group, University of South Australia, Thales Australia and Goonhilly Earth Station.

This project builds on a successful Phase One program of work and proposes to further develop an advanced optical communications system that has been shown to support optical fibre-like data transfer rates over atmospheric free-space communication links. This communication system is based on active optics-assisted, coherently phase-stabilised, optical communication technology; the efficacy of which is currently being investigated over horizontal free-space links. Phase Two of this research project will focus on deploying this technology on a series of vertical links through Earth's turbulent atmosphere, starting with low-altitude targets, progressing to light aircraft and stratospheric vehicles. It contributes to the SmartSat Technology Roadmap for Optical Comms and is highly aligned with several of the National Civil Space Priority Areas. The addition of partner Goonhilly Earth Station strengthens the commercialisation outcomes for this project. Goonhilly's GHY-6 deep space antenna is shown below.

Super resolution Mosaic Infrared Focal (SMIRF) Sensor

Led by Mark Ramsey at SITAEL Australia and with the University of Adelaide, this project aims to deliver an innovative low cost IR sensing capability using a multi-aperture array of low-cost imagers, combined with Super Resolution & Mosaic processing and an intelligent control system to switch between modes. It also considers SWaP requirements for small space platforms. It aligns with the infrared sensing technology component of the SmartSat Technology Roadmap (with broader applicability long term to problem centric operations) and with requirements for SmartSat's Aquawatcha and Disaster Resilience missions.

Other Approved projects

Under our Tactical Research Fund, the SmartSat Executive has also approved a number of research projects in the last quarter including:

• Autonomous Vision-based Space Objects Detection and Tracking in Orbit (P2-15) with University of Sydney, Thales Australia and HEO Robotics. This project will look at the feasibility of applying space-based optical sensors (including telescopes, hyperspectral imager and wide field of view star tracker) for space object detection and tracking in orbit.

• Knowledge Gaps and Opportunities for Earth Observation Tools in Mine Rehabilitation at the Property Scale (P3-09) with The University of Queensland and Frontier SI. This project aims to engage the mining industry and land management agencies to develop a clear understanding of EO tools needed to improve government monitoring, and industry management approaches to mine rehabilitation and restoration at the property scale (including stochastic event monitoring).

• Enhancing Earth Observation for Maritime Domain Awareness (EO4MDA) – Phase 1 (P3-10) with Leonardo Australia and Deakin University. EO4MDA is ultimately planned to be a multi-phased project aimed at enhancing Earth Observation practices and to generate robust and reliable information about the maritime domain.

• Decentralised Cognitive System for Radar Signal Recognition (P2-20) with DEWC Systems and Deakin University. This project aims to develop a novel distributed radio frequency processing capability for deployment across space-based platforms.

• Precision Timing for Space Based Applications - Utilisation Study (P2-21) with Frontier SI and RMIT. This project is aligned to SmartSat project, Compact Clocks for Small Satelite Applciations (P2-08) and will investigate what new opportunities and resilience a compact, high accuracy clock for use on small satellites would enable for a broad range of precision timing applications.

Game changing appointment for Australian Space R&D

The SmartSat Cooperative Research Centre has appointed an Australian Senior Engineer from NASA's Jet Propulsion Laboratory to accelerate Australia's leading space R&D program

Australia's rapidly emerging space sector has received a major boost with the appointment of a leading Aerospace Engineer previously involved in high profile NASA space missions including the recent landing on Mars.

Australia's rapidly emerging space sector has received a major boost with the appointment of a leading Aerospace Engineer previously involved in high profile NASA space missions including the recent landing on Mars.

In a move that will substantially strengthen Australia's space sector, Dr Carl Seubert, a Senior Aerospace Engineer at NASA's Jet Propulsion Laboratory (JPL) has been appointed as the Chief Research Officer at SmartSat CRC.

Dr Seubert's appointment will accelerate SmartSat's R&D program by driving innovation in the space sector and bolstering collaboration between Australian companies and global space organisations.

He has been a key figure in high profile NASA missions including the Perseverance rover landing on Mars in February. Dr Seubert's expertise and leadership will turbocharge Australia's space capability as it strives to become a leading player in space exploration.

A graduate in aerospace engineering from the University of Sydney, Dr Seubert has gained international credentials at NASA which will now help him guide SmartSat's Federal Government $245million R&D investment program.

Dr Seubert said he was excited to return to Australia at a time when the space industry is set to thrive under the leadership of Australia's centre of space innovation – SmartSat.

"I am thrilled to be joining the SmartSat CRC team. It will be a privilege and an honour to apply my NASA space engineering and leadership experience back home", said Dr Seubert.

"I look forward to engaging with world-class academic and industry partners and forging research collaborations to develop technology for Australia's future space missions. I am passionate about extending Australia's reach into space and for us to become a renowned space-faring nation."

SmartSat CEO, Professor Andy Koronios, said Dr Seubert's appointment was a game-changing move for SmartSat and his expertise would benefit the entire Australian space industry.

"We are absolutely delighted to appoint Dr Seubert as SmartSat's Chief Research Officer. I am particularly pleased to welcome an Aussie back home to help build our space industry" Professor Koronios said. "Dr Seubert's impressive career has seen him lead key missions for NASA JPL and win numerous awards for innovation, technical leadership and engineering excellence. His extensive experience at NASA JPL will certainly advance SmartSat."

Enrico Palermo, Head of the Australian Space Agency, recently returned from the US earlier this year and welcomed another Australian coming back to home shores to work in the growing sector.

"The appointment of Dr Seubert is a coup for Australia's emerging space sector. It's proof that many of our brightest and best minds want to return to Australia as the Federal Government and the space industry press ahead with a range of exciting initiatives in the years ahead."

Dr Seubert will take up his appointment at SmartSat at the end of May.

Education & Training College

Dr Ady James

Education and Training Director – Industry Training

We've taken two important steps in moving the work of the College forward this month.

Firstly, the strategic plan was approved and from that an operational plan developed and approved. This plan provides some broad KPIs for the College, which will help guide us in the prioritisation of activities that we undertake this year.

Secondly, the first draft of the Skills Gap Analysis Report was completed and presented to the College members at out meeting on February 23. Again, by highlighting those areas of specific interest to SmartSat CRC and where the most work is needed in terms of skills development, we can now start to work with our partners and others in planning to deliver those initiatives. By the time the next newsletter comes out we should have published our preliminary report of the analysis and identified the next steps.

In other areas, we are continued our industry webinar series in support of the Australian Space Agency's Demonstrator program, with "An introduction to Regulation" on March 4. In this seminar, experts from the Agency, Fleet, Gilmour Space and Nova will present their experiences in obtaining regulatory approvals for all aspects of getting a payload into orbit.

On April 15, our third seminar in this series will look at the challenges of the space environment and the associated verification and validation processes needed. Check our events page for registration.

Finally, if you look at the SmartSat website you will see that we have started profiling our SmartSat PhD students, so if you want to know about the exciting research areas that they are doing, this is your first port of call: PhD Students - SmartSat CRC.

Diversity & Inclusion Committee Update

Emily White

Executive Officer

SmartSat's commitment to D&I is demonstrated by working hard on several initiatives to expand our program of work in this area. The first SmartSat Employee Satisfaction and Engagement survey is under development and will be sent to staff in the coming months.

The data will be used to track progress in achieving a more diverse workforce, and to inform a range of HR policies and practices to ensure employees from all demographic backgrounds can contribute to their full potential. We are also in the final stages of developing our Staff Health and Wellbeing Program which is designed to create a positive workplace environment and support our employees' health and wellbeing.

We are preparing to commence Phase 3 of our collaborative project with the Inclusive Organisation. This will involve pilot testing the tool developed by the Inclusive Organisation to measure the state of inclusion across the SmartSat partner network. Updates on this project and the relevance to the broader space sector will be provided once the pilot testing is complete.

On Monday March 8, SmartSat celebrated International Women's Day (IWD). The 2021 theme was #ChooseToChallenge which aims to express commitment to challenging inequality, calling out bias and questioning stereotypes to help forge a more inclusive world.

Adelaide-based members of the SmartSat team attended the 'Women in Space' breakfast with keynote speaker Flavia Tata Nardini (Fleet Space). We would like to congratulate our Acting Chief Research Officer, Prof Allison Kealy, who was a guest speaker at the Surveying and Spatial Sciences Institute IWD event in Melbourne and our Deputy Industry Director, Dr Sarah Cannard, who was a panellist at the Engineers Australia IWD event.

SmartSat is proud to celebrate IWD and recognise the wonderful women in our team and partner network.

Please visit the SmartSat D&I webpage to stay up to date with our latest D&I initiatives. Our updated D&I Action Plan will be made available here in the coming weeks.

Awards

Dr Alexander Held PhD

CEOS Strategic Implementation Team co-Chair

Director - CSIRO Centre of Earth Observation Astronomy and Space Science

Australian Academy of Science COSPAR Massey Award

Dr. Held is the research Director of the Centre for Observation Program in CSIRO's Astronomy and Space Science unit, and an Associate Professor at the Australian National University. He is Project Lead on the Phase-0 AquaWatch project, a partnership between SmartSat and CSIRO to develop ground-to-space 24/7 water quality monitoring technology for Australia's waterways, reservoirs and coastal environments.

He is the first southern hemisphere winner of the COSPAR Massey Award, which reflects his pioneering contributions to Earth observation and the space sector in Australia and abroad.

Dr Held's PhD is from the University of California, Davis in the area of plant physiology. Since arriving in Australia and joining CSIRO in 1991, Dr Held has focused on the use of Earth observation data to improve scientific understanding in landscape ecology and vegetation condition. He led the award-winning delivery of the Sentinel Hotspots program (2002–2006), a national capability that continues to be widely used to support bushfire response activities in Australia.

He has been instrumental in developing the OpenDataCube initiative, as a foundation partner, which now has over 50 DataCube implementations globally and partners including NASA. As a member of the Australian Academy of Science's National Committee for Space Science and the Steering Committee for the 2010-2019 Decadal Plan for Space Science, Dr Held has been an influential voice in the Australian Earth observation community.

Dr Held is overseeing the establishment of the new satellite NovaSAR-1 as a national research facility. This will make CSIRO's 10% share in the UK radar satellite, with associated ground-segment, science program and user-engagement program, available to Australian researchers.

In the international arena, Dr Held served as member of the steering committee of the United Nations Office for Outer Space Affairs' Program on Space Technology for Disaster Management in Southeast Asia (2004–2007). Since 2017, he has been a member of the intergovernmental Group on Earth Observation (GEO) Executive Committee and closely involved in the establishment of GEO's flagship activity, the Global Forest Observation Initiative. He has been Chair of the Committee on Earth Observation Satellites (CEOS) and is now co-Chair of the CEOS Strategic Implementation Team (2019-2021).

Aurora Startup Cluster

Dr Tim Parsons

Chair, Aurora Space Cluster

NSW Node Coordinator

On behalf of the Aurora Interim Board, I'm delighted to be focusing this newsletter article on new opportunities for our Aurora members.

Member Opportunities

Upcoming Challenges

We've got a vision for Australia to be a powerhouse in the HAPS domain, and if you're an Earth Observation and/or sensor or even a HAPS platform company, watch this space for an upcoming challenge!

NSW Node First Demonstrator EOI Released

Following a successful launch the NSW Node has released its first Industry R&D Partnerships EOI for demonstrator projects focused on Earth Observation. Each EOI will operate within a 12-week release and decision cycle, aimed at showing how research knowledge can solve valuable industry problems with fast 12-month projects valued up to $100K, with a 1:2 industry:node funds matching ratio. This is a national opportunity as a NSW based company and a NSW research provider can partner with any other Aurora member on this project. The first of many state nodes that SmartSat hopes to open, the NSW node will also be funding talent mobility, infrastructure access, and events programs for NSW industry and R&D organisations. If you're based in NSW, you should be contacting me (Tim Parsons) as I'm the node coordinator. Email me, send me an SMS on 0417 463 972.

Space Meetups

It's time to get back to in-person, face-to-face networking! Planning has begun on a regular series of Aurora events in major capital cities through April and May. If you'd like to host an Aurora meetup in your capital city, showcasing your

company to break the ice, we want to hear from you! Please contact me, I'll take you through the pattern we're hoping to trial.

Aurora eNewsletter

We're about to begin production of our own bi-monthly newsletter for members with news of up-and-coming events and opportunities.

Space Forum

If you're heading to Adelaide at the end of the month, we'll be there!

- Aurora stand - Aurora will have a stand, to share some more opportunities and news with you, as well as find out what areas you need help with in your businesses. Look out for us in the exhibition foyer!
- Tour of the MCC – we've organised a special tour of the MCC for Aurora members. Places are limited - if you'd like to join, please register here.
- Aurora Space Meetup – after the forum, we're going to host a meetup to discuss everything we've learned at the forum. Register your interest here.

Updates from the Australian Space Agency

Consultation on partial cost recovery

The Australian Government agreed to introduce a partial cost recovery model, which was outlined in the Mid-Year Economic and Fiscal Outlook (MYEFO) 2019-20. Fees were expected to commence on 1 July 2020, however due to the impacts of the COVID-19 pandemic the commencement of fees was deferred to 1 July 2021. The Agency is seeking feedback on proposed changes to the regulatory framework related to fees and inviting public consultation on the implementation of partial cost recovery for certain activities. Visit the Consultation Hub to comment on the draft cost recovery implementation statement and draft legislation.

First Moon to Mars grants announced

The first round of Moon to Mars Supply Chain Capability Improvement grants will support the two recipients to develop their work, and tap into national and international space supply chains. The two recipients of the Moon to Mars Supply Chain Capability Improvement grants are:

Spiral Blue (NSW) (an Aurora Member) has received a grant of $416,250 to develop Space Edge software for use aboard Earth observation satellites to enable data processing on-board the satellite.

Advanced Navigation and Q-CTRL (NSW) have received a grant of $690,892 to develop a world-first inertial navigation system for space missions.

Reminder: Supply chain capability grants

The Moon to Mars Supply Chain Capability Improvement Grant Opportunity aims to support Australian industry to deliver products and services into domestic and international supply chains.

The third intake of Supply Chain capability grants is closing on 4 May 2021. New dates for subsequent intakes across 2021-22 have been published here.

Satellite Technology Feasibility study

To inform the Agency's upcoming Earth Observation technology roadmap, our partners have been working on a series of reports to explore opportunities for the Australian space sector. The first report released is a satellite technology feasibility study. Read it here.

Space economic snapshot released

The Australian Space Agency has analysed and reported on the progress of the Australian space sector between the financial years of 2016-17 and 2018-19. The report/s provides an independent analysis of the sector's economic contribution in 2018-19 and also considers future potential, including an analysis of transferrable capabilities. Read the report.

UK-Australia Space Bridge briefing

Following the ASA's recent UK-Australia Space Bridge Arrangement announcement, there will be an industry briefing with the Australian Trade and Investment Commission (Austrade) on Thursday, 25 March at 5PM (AEDT). The briefing will cover the Arrangement, planned activities and opportunities being explored to foster closer collaboration, and a Q&A session. Read more and register.

SmartSatCRC NSW Node Launch

The launch of the NSW Node of SmartSat CRC was held on March 9 at the Museum of Sydney. The Node was officially opened by the NSW Minister for Jobs, Investment, Tourism and Western Sydney, the Hon. Stuart Ayres, MP.

The Node, a partnership between the NSW Government and SmartSat, is designed to maximise collaboration between industry and academia by developing space-related technologies in advanced telecommunications and IoT, intelligent satellite systems and next generation earth observation data services.

"Supporting a thriving research ecosystem is just one part of our Space Industry Development Strategy, which will also help develop a fit-for-purpose workforce by closing the STEM skills gap and support the growth of innovation precincts," Mr Ayres said.

"The technology advances produced by the space industry also have enormous impact here on earth, from using GPS on a smart phone to monitor bushfires to using artificial intelligence to reduce waste in all our industries."

During the event Dr Tim Parsons was announced as the NSW Node Coordinator. Dr Parsons is Chair of the Space Industry Association of Australia and has long supported the growth of the NSW space eco-system, in particular space startups, through his organisation Delta-V Newspace Alliance.

"The NSW Node will strengthen the outcomes of the SmartSat CRC by enabling more startups and SMEs to participate. Research partnerships like the current one between the University of Sydney, Thales and space startup High Earth Orbit Robotics demonstrated the kind of industry and research collaboration the Node would cultivate," Dr Parsons said.

SmartSat CRC CEO Professor Andy Koronios said the NSW space ecosystem is poised to embrace commercialisation opportunities of space-related technologies.

"SmartSat is incredibly excited to be partnering with the NSW Government in establishing this Node and augmenting other NSW initiatives to supercharge the NSW space innovation ecosystem. We are already working on a number of exceptional R&D projects that will develop space capabilities and build the commercialisation pathways within the State," Professor Koronios said.

At the launch, an Open Call for projects' Expressions of Interest (EOI) was announced, to foster the creation and commercialisation of space-related research and innovation in NSW. The Call aims at empowering the space-related industry ecosystem of NSW, creating State-based opportunities for industry-led R&D with SmartSat CRC's current partner base and beyond. The first Open Call is seeking demonstrator projects relevant to Earth Observation. Read more here.

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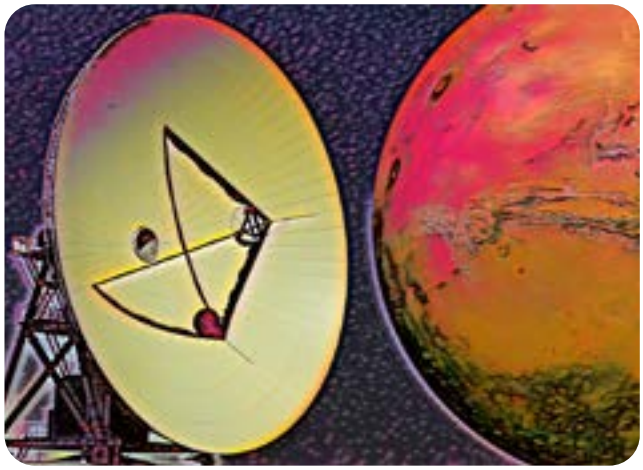
News from our partners

Goonhilly's Deep Space Antenna tracks global push for Mars, in UK first



Goonhilly Earth Station will play an instrumental role in the next generation of space exploration using its new GHY-6 antenna to enable deep space communications on pioneering missions to the Moon and Mars.

Goonhilly has been working with the ESA over the past few weeks, using Mars Express – a spacecraft on an active Mars mission – as the test vehicle to validate their GHY-6 antenna. They are currently shadow tracking Mars Express as it orbits the red planet. While shadow tracking Mars Express in this pre-operational phase, Goonhilly has also received signals from another global mission - the UAE Space Agency Hope Mission.

Picking up signals on February 9, Goonhilly was able to report that the UAE Space Agency Hope Mission successfully entered Mars's orbit. In a significant month for Mars missions, Hope was followed by CNSA Mars Mission Tianwen-1 on February 10. There are hopes that Tianwen-1, a rover-holding satellite, will touch down on Mars in May.

Only a week after these two missions entered Mars's orbit, on February 18, NASA's JPL Perseverance rover landed on Mars's surface, and the GHY-6 antenna was pointed at Mars during the landing attempt.

Having already proved its capabilities in these transmissions, providing final testing is successful, GHY-6 will become the world's first commercially operational deep space antenna. In the next few weeks it will be ESA qualified, able to support any normal operations including monitoring telemetry, sending telecommands and downlinking science data. Crucially, the antenna will enable NASA and ESA to ensure continued support for ongoing missions with a long-lasting legacy.

Click here to read more.

Myriota and Goanna Ag Launch Innovative Ag Tech Products to Manage Rainfall and Water Usage

Australia's climate has wreaked havoc on farming in recent years, with periods of drought as well as increased rainfall caused by La Niña impacting agricultural production. The drought that began in 2019 was estimated to have reduced Australia's GDP by between $9.5 billion and $14 billion, and demonstrates why water management has never been more critical to the survival of the Australian agricultural industry.

Goanna Ag, Australia's leading provider of on-farm sensor solutions, and their partner Myriota, the world leader in low-cost and low-power satellite connectivity for the Internet of Things (IoT), have today announced the commercial launch of two innovative new products set to change how farmers manage water resources: GoRainSat® and GoTankSat™.

GoRain allows farmers to monitor rain data remotely, gain a better understanding of rain variability across their farms, and enable data-driven decisions to support stronger crop yields. GoTank is designed for the livestock industry and remotely updates farmers on water tank levels. It ensures livestock wellbeing and removes the need to manually check water tanks.

Underpinned by Myriota's low cost, long battery life and connectivity, GoRain and GoTank usher in this new era of affordable digital innovation in water management and solve one of agriculture's biggest challenges – the optimisation of on-farm water use. One project backed by the Australian Department of Agriculture and Water Resources revealed that digital innovation initiatives have the potential to increase the GDP of the Australian agricultural sector by $20.3 billion.

The partnership between Goanna Ag and Myriota will see GoRain and GoTank devices make use of Myriota's network of nanosatellites, which provides a low-cost, low-power solution for IoT connected devices. For farmers, this means that data from rain gauges and tank monitors can now be collected from anywhere in the world where you can see the sky, and seamlessly displayed in Goanna Ag's apps.

Click here to read more.

Events

Distinguished Speaker: Professor Ashish Mahabal

Near-Earth and Deep-Space Computing: Opportunities and the Future

Prof Ashish Mahabal is an astronomer (Division of Physics, Mathematics, and Astronomy) and Lead Computational and Data Scientist (Center for Data Driven Discovery) at the California Institute of Technology, Pasadena, USA, and an adjunct faculty at the Inter-University Center for Astronomy and Astrophysics, Pune, India.

This presentation elaborated on near-Earth and deep space computing research being conducted by Keck Institute for Space Studies (KISS). Besides Earth science missions and those targeted towards satellites of planets, more general astrophysical ones studying extragalactic space also stand to benefit.

Webinar: Introduction to Australian Space Regulation

One in a series of educational webinars hosted by SmartSat and presented by industry in support of the ASA Demonstrator grant program. The aim is to help the developing space industry to understand the significant challenges of putting systems into orbit. This second webinar provided an overview of Regulatory Requirements.

This webinar featured presentations from Mike Kenneally, Fleet Space Technologies and Phil Krix, Nova Systems, and covered topics including Licensing to launch (payload and launch provider perspective) and Spectrum Allocation.

Distinguished Speaker: Larry D James

Deputy Director, NASA Jet Propulsion Laboratory

Going to Mars with Perseverance – the Search for Life and Preparing for Human Exploration

With the Perseverance Rover landing on Mars on February 18, this presentation discussed the innovative technologies applied in the Mars mission and JPL's solar system exploration program.

Larry D. James was appointed Deputy Director of the Jet Propulsion Laboratory in August 2013. At JPL he is the Laboratory's Chief Operating Officer responsible to the Director for the day-to-day management of JPL's resources and activities. This includes managing the Laboratory's solar system exploration, Mars, astronomy, physics, Earth science, interplanetary network programs, and all business operations. These activities employ 6000 scientists, engineers, technicians, and business support personnel, generating $2.6 billion in annual revenues.

Future Events

11th Australian Space Forum

Date: March 31, 2021
Location: Adelaide Convention Centre

Hosted by the Andy Thomas Space Foundation with support from the South Australian Government, the Australian Space Agency and the SmartSat Cooperative Research Centre, the Australian Space Forum is a bi-annual event held in Adelaide bringing together the best and brightest from Australia's space industry and around the world.

The forum will feature panels on Australia's space landscape, space science education, opportunities in communication technology and advanced space manufacturing. It will also include what will be the largest industry exhibition in the event's history, showcasing over 60 exhibitors.

In-person attendees can meet with industry leaders within the event's designated networking hour and can attend all of the panel presentations. Those attending virtually can use the Australian Space Forum's interactive app, where delegates can watch panel sessions, participate in the Q&A, and connect with other attendees remotely.

Register or review the forum here:

https://forum.andythomas.foundation/forum-11/

SmartSat Industry Webinar 3: Space Environmental Challenges (Part 1)

Date: April 15, 12.30–2pm ACST

Continuing the series of educational webinars hosted by SmartSat in support of the ASA Demonstrator grant program. This session will cover topics including launch stress, thermal, vacuum, materials, radiation, and the T&E and V&V programs to support this aspect of space qualification.

Registration link will be provided on the SmartSat event page.

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