

2021



## FUTURE OF PARTNERSHIPS

A FICCI- Eram Group Initiative



# KNOWLEDGE PAPER FUTURE OF INDIA-OCEANIA SPACE TECHNOLOGY PARTNERSHIPS

SEPTEMBER 14- 15, 2021

## OCEANIA DIVISION

FEDERATION OF INDIAN CHAMBERS OF COMMERCE AND INDUSTRY (FICCI)  
FEDERATION HOUSE, TANSEN MARG, NEW DELHI, INDIA



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## SECTION 1

### BACKGROUND

In this VUCA world, leadership is as much about innovation, as much as it remains to be an 'art', in an environment where change is the only constant. An environment wherein independence and interdependence will go hand in hand when we look at future global partnerships. Global leaders continue to strive for excellence while making their businesses resilient and adaptable. At the same time business leaders ought to focus on sustainability and gender diversity, as fundamental principles for their future partnerships. Challenges presided over by opportunities forced us to 'reimagine the future' of economic and development partnerships, that touch lives of millions around the world.

FICCI envisages that a platform needs to be created to reimagine business - **LEADS** (Leadership, Excellence, Adaptability, Diversity, Sustainability), which is an Annual International Flagship program of FICCI.

### CONTEXT

**LEADS 2021** is planned on **14-15 September, 2021**, in a **hybrid format** with an overarching theme of '**Future of Partnerships**'. It will facilitate full-day engagements aligned with time zone differences with East Asia, Central Asia, South Asia, ASEAN & Oceania, Europe, Africa, West Asia, Americas, and the Pacific.

**Session Brief:** Oceania region has many unique advantages, from their geographical position in the southern hemisphere, to their wide-open spaces and relatively low light pollution, to expertise in satellite data applications. India already has end-to-end capabilities and evolving as force to reckon with in the world, making and launching its own rockets, satellites and information systems for larger benefit of its people. At the same time India is building a reputation for frugal space technologies vis-à-vis the West. This session will focus on how India and Oceania countries can evolve partnerships in space exploration in areas such as data calibration, remote sensing and Artificial Intelligence (AI), to make the world a better place.



## SPEAKER PROFILES



### **Dr. Jitendra Singh, Union Minister of State (I/C), Ministry of Science and Technology, Earth Sciences, MOS for PMO/Personnel, Atomic Energy, Space, Government of India**

Dr Jitendra Singh was elected to the 16th and 17th Lok Sabha from Udhampur Constituency from Jammu & Kashmir in 2014 and 2019 respectively. He is also a popular Diabetes specialist of international repute, Professor Diabetes and Endocrinology, noted intellectual, author, invited faculty to all the major Diabetes conferences and a social activist.



### **Dr Sangita Reddy, Immediate Past President, FICCI and Joint Managing Director, Apollo Hospitals**

Dr. Sangita Reddy is a Global Healthcare Influencer, Healthcare Technocrat, Social Entrepreneur and Humanitarian. She is an Honorary Consul of Brazil in Hyderabad. She is a member of The World Economic Forum, Rockefeller working Group and other institutions. She has been a recipient of numerous prestigious awards in health care industry.



### **Mr Vikram Chandra, Founder, Editorji Technologies**

Vikram is the founder of Editorji Technologies – a start-up that seeks to transform video news through innovation in user experience, using artificial intelligence. He was one of India's best-known TV news anchors, presenting "The Big Fight", 9 o'clock News, Gadget Guru, Cleanathon, Greenathon and "Save our Tigers".



### **Mr Anthony Murfett, Deputy Head, Australian Space Agency**

Mr Anthony Murfett is Deputy Head of Australian Space Agency. He has oversight of strategy, policy, operations and supports the Agency Head in monitoring the performance of the Agency. He brings an entrepreneurial spirit to the Agency, valuing partnerships while drawing strength from diversity and pushing the boundaries of our knowledge.



### **Dr. Jason Held, CEO, Saber Astronautics**

Dr. Held, CEO, Saber Astronautics is the leader of multidisciplinary science and engineering teams providing leadership and company direction. He was a distinguished leader in the U.S. Army providing space military planning and operations. He has worked on multiple projects in areas across developing tools, designing tests, providing training, hardware & software integration.



### **Mr Radhakrishnan D, Chairman & Managing Director, New Space India Limited, India**

Mr Radhakrishnan has 30+ years of experience with ISRO. He has expertise in Launch Vehicle configuration, Mission design, Commercial Launch services and Communication satellite services. He represented as member of Indian delegation in UN-COPUOUS. He has handled commercial launches of 300+ international customer satellites on-board PSLV over past 20 years.



### **Professor Andy Koronios, CEO & Managing Director, SmartSat CRC, Australia**

Professor Andy Koronios is the CEO of the SmartSat CRC, a consortium of industry and research organisations developing game changing satellite technologies to catapult Australia into the global space economy. Previously, Andy held the positions of Dean: Industry & Enterprise and Head of the School of Information Technology & Mathematical Sciences, at the University of South Australia.



## SECTION 2

### DISCUSSION AGENDA

#### OVERVIEW OF INDIA- OCEANIA SPACE TECHNOLOGY PARTNERSHIPS

Oceania is a vast expanse of the world where the Pacific Ocean rather than land borders connects the nation. It includes the continental land mass of Australia and vast area of the Pacific which includes larger island masses of Papua New Guinea and New Zealand as well as the territories of the Pacific Islands. The term Pacific Island Countries (PICs) refers to the fourteen countries scattered in the South-West Pacific Ocean. These are the Cook Islands, Fiji, Kiribati, the Marshall Islands, Micronesia, Nauru, Niue, Samoa, the Solomon Islands, Palau, Papua New Guinea, Tonga, Tuvalu, and Vanuatu.

Oceania is an increasingly important component of India's Act East policy. The India-Oceania economic relationship has undergone evolution in recent years. Visits by Oceania Ministers and a reciprocal visit by Indian Prime Minister Shri Narendra Modi in recent years demonstrate the importance both regions are placing on the relationship. Trade and commercial links between the two nations began to deepen since the turn of the century. India has historically enjoyed very close and cordial ties with Oceania region and particularly with Australia, New Zealand, Fiji and Papua New Guinea.

While collaborations are happening on lot of fronts, India and Oceania's relationship is yet to develop to its full potential. India can consider Oceania as a strategic region especially in **Space Technology sector**. There is enormous scope for closer ties in this particular sector between India and Oceania; a sustained engagement would greatly benefit both the regions economically.

India's space programme which began in the 1960s has evolved, with time. India has one of the most well-developed formal space programmes in the world and has achieved numerous successes. Ranging from development of satellites and launch vehicles indigenously, to



rendering space-based services to the nation, bringing India's own Global Navigation Satellite System (GNSS) services through Indian Regional Navigation Satellite System (NavIC) to scientific and exploratory missions to outer space – the list of ISRO's achievements is extensive.

India's space endeavours have occupied a special place due to the richness and the quality of their contributions. In view of these multiple dimensions and capabilities, further added with cost effectiveness; India is recognized as a leader in space applications that have a wide impact on society. However, the sector was largely led by ISRO in India with some participation from industry. The recent reforms announced by Government of India and conscious steps taken by ISRO to engage industry more actively, has opened up galaxy of opportunities for industry Heralding a new era in Indian space.

Oceania region's geographical location in the Southern hemisphere, relatively low light pollution and wide open spaces makes the region optimal for various launch activities and suborbital rocket launches. Thus, making it an attractive choice for an increasing amount of space activity.

Australia's strengths and advantages in space (such as capabilities in advanced communication technologies and services, Earth observation, and robotics and automation, as well as its unique geographical location) provide significant opportunities for collaboration with India.

Australia is India's important partner in space collaboration. Australia and India have been partnering since 1987 to support data calibration and laser ranging for Indian satellites, launching Australian satellites, and conducting joint research. India's partnership with Australia on the subject of space is underpinned by a formal Memorandum of Understanding signed between the two countries in 2012. The Australian Space Agency and Indian Space Research Organisation have signed an Memorandum of Understanding (MOU) in February to increase their cooperation across civil space activities. As part of steps to deepen cooperation in civil space activities, the space agencies of India and Australia have been working together to position temporarily Indian tracking facilities in Australia. Australia is already in discussions to host vital tracking infrastructure as part of India's Gaganyaan missions, which will place India as the fourth country to put humans in space.

Located in the South Pacific, New Zealand is remote from much global aviation traffic, making it an ideal location to launch satellites on demand and at shorter intervals, a growing need of the satellite industry. New Zealand has some of the largest selection of launch angles (azimuths) for rocket launches in the world. This creates opportunities for frequent launches



— a game-changer for a world that has an insatiable demand for the data captured by satellites — and for testing new technologies. New Zealand space sector was worth \$1.69 billion in 2018-19 and supported 12,000 jobs. New Zealand has strong space manufacturing and space applications sub-sectors, and cutting-edge research and development capability within several universities across the country.

India and New Zealand can rejuvenate their economic engagement by finding new avenues for investment and business in areas such as space exploration. Both countries can explore the ability to monitor and track all types of satellites, spacecraft, debris and other objects in the Earth's orbit – by developing ground-based satellite and debris-monitoring stations.

Fiji played an instrumental role in success of India's Mars mission in the very first attempt. Fiji was the data collection hub for the Mars mission. Fiji was chosen for its ideal location, being a communication hub and India's close and friendly relations. An 18-member team of top scientists and engineers from India's International Space Research Organisation (ISRO) were in Fiji to pave the way for India's mission to Red Planet. The mission was monitored from Fiji and other parts of the South Pacific Ocean.

Space sector in pacific islands needs to be more developed. Most Pacific island nations lack the expertise and resources needed to establish ground facilities to access space services or to build small satellites. Considering proximity to the Pacific island states, India can help build space capabilities in the region by offering education programs and helping to develop launch facilities.

Kiribati and Nauru are geographically optimal locations to deploy satellites into orbit because they're very close to the equator. Cybersecurity, engineering, legal, science and policy degrees and experience are essential to forming space policy and creating space-based technologies. Island states' education institutions are already skilling individuals in these areas, and India can help with on-the-job training. Professional development placements with ISRO can create pathways for Pacific representatives to develop space-oriented expertise.

Thus, it is necessary for both the regions to adopt measures to build partnerships and develop long-term autonomy and capacity in space. "Time is finite, however, and collaboration is needed now, not later."

## SECTORS OF COLLABORATION IN SPACE SECTOR



### 1. Upstream- Satellite manufacturing and Launch

Small satellites are transforming the dynamics and economics of the space industry. According to a recent market study, it is estimated that more than 10,000 small satellites will be launched in Low Earth Orbit (LEO) by 2026.

Small satellites require less time to build, thus improving the upgrade frequency. There has been a spurt in demand for satellite-based applications such as remote sensing and communication, and this has boosted the demand for small satellites, which New Space start-ups are aiming to fulfil.

India is all set to become the hub for the small satellite launch market, which is estimated to be valued at around \$38 billion by 2027. Australia and New Zealand on the other hand have emerging capabilities in design and manufacture of nano- and micro-satellites in universities and emerging start-up companies, manufacturing of satellite subsystems, including high performance optics, radio communications systems, optical communications systems and on-board data handling manoeuvring.

India and Oceania government agencies and private companies can consider collaborating for manufacturing of small satellites and microsatellites, which can be done through the miniaturisation of electronic and other components and increasing effectiveness of global supply chains.

### 2. Mid Stream- Satellite Operations and Commercial Activities

India and Oceania defence manufacturers and researchers could collaborate on joint research and development in areas of mutual interest such as joint working on satellite operations and space related commercial activities. There is an opportunity for both regions to collaborate and work on joint projects in some of these areas, with the involvement of academia, industry and the startup community forming an ecosystem for enhanced engagement. Such partnerships can also help global defence companies expand their businesses.

### 3. Down Stream- Remote Sensing Technology

The downstream space segment consists of the application of satellites for communication, scientific research, weather forecasting, geological and oceanographic studies, disaster management, agricultural studies, and all products and services related to these areas. With



the right use of data analytics capabilities coupled with artificial intelligence (AI) and machine learning (ML) algorithms, the data generated can be of immense value for decision making.

Remote sensing today has come to stay as an integral part in the vital sectors of agriculture, hydrology, geology, forestry, oceanography, mineral resources and disaster management like drought, flood, cyclone, earthquake, landslides, crop pests, forest fires etc., thus touching every facet of country's development. Today, India has acquired a strong self-reliant base to harness the full potential of this technology. While Australia is a world leader in the use of remote sensing technologies.

India has many collaborative programmes with several countries in promoting active cooperation in remote sensing. For example, the ESCAP/UNDP Regional Remote Sensing Programme (RRSP), under the execution of the ESCAP, is playing a crucial role in promoting active cooperation in remote sensing among member countries of Asia-Pacific region, by bringing together experts from different areas who can share their experiences, disseminating information on available expertise. **India and Oceania countries can collaborate by conducting regular training courses by several training institutions in both regions and share best practices with each other in this technology.**

There is also huge scope for the commercialization of the ground operations like mission support, satellite broadband gateways and 5G backhauling.

## QUESTIONS FOR OCEANIA THEME SESSION: FUTURE OF INDIA-OCEANIA SPACE TECHNOLOGY PARTNERSHIPS

1. India is among a handful of countries with advanced capabilities in the space sector. With the new reforms, the sector will receive new energy and dynamism, to help the country leapfrog to the next stages of space activities. What are your views on how government of India will provide a level playing field for private companies to use Indian space infrastructure. How will this open avenues for international collaboration?
2. The exploration of space is becoming global. More nations are now within reach of space than ever before. Space-based technology has enabled international cooperation and entrepreneurship. How do you see the role of Space-based technology supporting collaboration between India and Oceania region? What according to you, should leaders think about when considering Space technologies for the region?



3. To cater to emerging Global Small satellite launch service market, ISRO has taken up the development of SSLVs. What are the three priorities for small satellite launch vehicles for the future in Indian space landscape? How do you think India can align the opportunities in SSLVs and take forward the cooperation with Oceania region?
4. The upstream space market, with its rocket launches and high-tech satellite payloads, may seem at a first glance to be the most exciting segment of the space industry. But when it comes to innovation, job and revenue creation and the provision of services that change people's lives for the better, the downstream market is where the action is. What are your views on how can we take forward collaboration with Oceania?
5. Our past and ongoing collaborations are a bright spot in the already strong India -Oceania relationship, and yet I believe we can continue to push forward and do even more together. Please share your views on some of the other considerations for supporting successful collaboration in space sector between the two regions.
6. Private Industry and Start-ups are becoming important players in the global space economy. With this, there is an opportunity for large-scale employment in the technology sector and India becoming a Global technology powerhouse. What are your views on the same?
7. Public investments represent the bulk of funding in space activities. Governments invest in space capabilities to support broad socio-economic purposes and the development of scientific capacities, in addition to national security and governance objectives. How crucial in your opinion is the spending /investments in R&D in view of the growth prospects of this sector?

## CONCLUSION

The Space Industry is emerging as one of the most lucrative industry globally. Indian capabilities in space represent a wide spectrum of expertise ranging from the conceptual design to building and operating a variety of space systems, which are matched only by a few nations in the world. India and Oceania should explore the opportunities for regional alliances to improve returns from space sector and exploit emerging opportunities. There is need for both the regions to jointly develop and embrace practices, approaches, and processes and identify space technological solutions and innovative products to explore partnerships and joint ventures.



## SECTION 3

### SOCIAL MEDIA COVERAGE

**FICCI LEADS @FICCILEADS · 3h**

Hi Everyone,  
I'm thrilled to be sharing my vision on the future of India-Oceania Space Technology partnerships at [#LEADS2021](#). Do Join me & my friends at the global event either personally or virtually. Don't Miss Out! - [@docjase](#), CEO, [@SaberAstro](#) [#Australia](#). [@ficci\\_india](#)



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[#LEADS2021](#) is a 2-day global thought leadership initiative, planned on 14-15 September 2021, curated as a strategic platform to imbibe leadership vision on the future of fundamental aspects of global economic prosperity. Register Now at [ficcileads.in](#)



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**FICCI LEADS @FICCI · 22/07/21**  
As an emerging space nation, it's important for #Australia to establish valuable international partnerships to leverage our various strengths to create opportunities & support the continued growth of the space industry. @DeputyHdSpaceAu @AusSpaceAgency @aibcltd  
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**Mr. Anthony Murfett**  
Deputy Head  
Australian Space Agency

" As we look to the future, partnerships across the global space sector will remain incredibly important. They will enable us to continue leveraging our various strengths, create new opportunities, inspire, and drive the growth of the industry. Join me at #FICCILEADS2021 to discuss the 'Future of India-Oceania Space Technology Partnerships' on 15 September 2021 at 1000 – 1100 hrs (IST) "

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Deputy Head, Australian Space Agency

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Established in 1927, FICCI is the largest and oldest apex business organisation in India. Its history is closely interwoven with India's struggle for independence, its industrialization, and its emergence as one of the most rapidly growing global economies.

A non-government, not-for-profit organisation, FICCI is the voice of India's business and industry. From influencing policy to encouraging debate, engaging with policy makers and civil society, FICCI articulates the views and concerns of industry. It serves its members from the Indian private and public corporate sectors and multinational companies, drawing its strength from diverse regional chambers of commerce and industry across states, reaching out to over 2,50,000 companies.

FICCI provides a platform for networking and consensus building within and across sectors and is the first port of call for Indian industry, policy makers and the international business community.



**LEADS 2021** is a unique multi-faceted 2-day global thought leadership initiative curated as an engagement platform for insights into five fundamental questions that underlie the quest for global economic prosperity with sustainability, inclusivity and social wellbeing. This year, this programme shall be organised from 14-15 September, 2021. FICCI LEADS is an endeavour to evolve a shared vision among global leaders, to reimagine economic growth on the pillars of globalisation and 'Atma-Nirbhar' economy.

In the backdrop of self-reliance, economic resilience and multilateralism, the focus would be 21<sup>st</sup> century challenges and giving a fresh meaning to global business value chains. This FICCI initiative is curated towards this objective at a time when we also need to reaffirm solidarity across borders with optimism for the future. FICCI LEADS 2021 will be a confluence of global leaders, influencers and opinion shapers across the spectrum of world economy. The program is open to select audience by special invitation only over 100 countries and India.