

INDIA-UAE COOPERATION IN OUTER SPACE: CHALLENGES AND OPPORTUNITIES

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India enjoys a healthy relationship with the Middle East nations. India's relations with the United Arab Emirates (UAE) go back to 1972 when India established diplomatic ties with the UAE Federation. Since then, both nations have come a long way and made various efforts to strengthen their relationship and cooperated in various fields and domains and now include Outer Space.¹ Today, India-UAE relationship achieved bilateral trade value of US\$ 73 billion and both countries aimed to increase it to US\$ 100 billion by 2027.² With the UAE's intent to shift its economy's reliance from oil to a knowledge-based economy, the UAE continues to emphasise on innovation, outer space and nuclear, and science and technology. India's strong presence in these areas will allow them to further solidify their engagement. The launch of 104 satellites by India, including the

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1. Rajeswari Pillai Rajagopalan, "Modi's UAE Stopover to give a Fillip to the India-UAE Partnership", ORF, July 5, 2022, at <https://www.orfonline.org/research/modis-uae-stopover-to-give-a-fillip/>. Accessed on December 1, 2022.
2. "India-UAE Bilateral Trade to Surpass US\$ 88 billion This Year", *ET Energy World*, November 23, 2022, at <https://energy.economicstimes.indiatimes.com/news/oil-and-gas/india-uae-bilateral-trade-to-surpass-usd-88-billion-this-year/95706582>. Accessed on November 29, 2022.

UAE's Nayif-1 nanosatellite in 2017 and, on the other hand, UAE employing India's expertise to launch UAE Hope (Amal) Probe for Mars Mission were viewed as UAE trust and belief in India in the outer space.

The UAE emerged as a new Space player in 2008 with the formation of a Pan-Arab Space Agency which later led to the establishment of the United Arab Emirates Space Agency in 2014. The UAE's successful Space missions in recent years include UAE astronaut, Hazzaa Al Mansoori's visit to the International Space Station (ISS) in 2019 and Sultan Al-Neyadi in 2023. Such missions and UAE's intent to push cooperation in outer space to benefit humanity allowed the UAE to look for ways to collaborate and utilise India's vast history and experience of successful Space missions. As ISRO Chief Dr. K. Sivan highlighted, the outer space is one such significant area where India looks for international cooperation; he also appreciated the efforts made by India and the UAE to work together in the Space sector.³

With Comprehensive Economic Partnership Agreement (CEPA) coming into force in May 2022 (a milestone achieved in 88 days), both countries recently signed two MoUs which emphasised cooperation in seven areas including the Space systems which will strengthen the UAE-India Space cooperation and research.⁴ As MoUs pushed research and innovation in all seven key areas of cooperation, it will also generate employment and strengthen industries in India and the UAE through investment and technology transfer—India's IN-SPACE and NSIL come into the picture. Meanwhile, as both countries are vital to each other's future, India's cost efficiency and vast experience in the outer space sector and exploration will assist the UAE in achieving their aim to reach Space, allowing them to further expand their area of bilateral cooperation.

3. Sajila Saseendran, "Expo 2020 Dubai: India to Boost Space Partnerships with UAE, say ISRO Officials", *Gulf News*, October 17, 2021, at <https://gulfnews.com/expo-2020/news/expo-2020-dubai-india-to-boost-space-partnerships-with-uae-say-isro-officials-1.83010824>. Accessed on December 1, 2022.

4. George Russell, "UAE, India Sign Deal to Cooperate on Advanced Tech", *Asia Financial*, June 12, 2022, at <https://www.asiafinancial.com/uae-india-sign-deal-to-cooperate-on-advanced-tech>. Accessed on December 1, 2022.

MOVING COOPERATION TO OUTER SPACE

To secure strategic and security interests, nations go to extremes to secure their interests, causing race and conflict among them, as witnessed over the ages. As outer space isn't confined to national boundaries, which asks for international cooperation, and unlike the Cold War period, today there are more Space-faring nations and thus such cooperation is very much needed. However, India regards the outer space has a dimension which is beyond national consideration and requires international cooperation and partners. Since the establishment of ISRO in 1959, India's Space Programmes have emphasised International Cooperation and further pushed for bilateral and multilateral relationships in outer space.

As India aims to strengthen its relationship with other countries and expand its expertise in scientific knowledge and technological domain, it emphasises using outer space for peaceful purposes and wants other nations to follow suit. Over the years, India was able to achieve its goals of becoming a reliable, efficient and cost-effective Space partner for other countries. In this regard, India has signed various MoUs and Agreements with many countries and from the Middle East, Oman, Saudi Arabia, the United Arab Emirates, Kuwait, Bahrain and Syria. With the creation of the UAE Space Agency (UAESA) in 2014, currently, the UAE is operating 19 Earth-orbiting satellites with 10 in the pipeline. With the UAE achieving such feats with reliance on other space powers—including India—shows that the UAE has the credibility and capability and is a useful partner to India—considering the current India-UAE relationship—in outer space exploration.

India and UAE since 2014

Since 2014-2015, there has been a significant shift in India's foreign policy and relations with the UAE. On the other hand, concrete steps have been taken in the Space domain since PM Modi's visit to the UAE in 2015.⁵ As both countries realised, there is a need to have greater cooperation in outer space, from the launch of satellites to

5. Alvite Ningthoujam, "Taking India-Gulf Cooperation into Space", *The Diplomat*, July 28, 2020, at <https://thediplomat.com/2020/07/taking-india-gulf-cooperation-into-space/>. Accessed on December 1, 2022.

the establishment of ground-based infrastructure to the development of Space applications. India recognised the relevance of UAE Space Research Centre at Al-Ain (2015), and subsequently an MoU was signed between ISRO and the UAESA in 2016 to explore and use outer space for peaceful purposes. Further, to reduce its reliance on oil, the UAE wants to become a global hub for technological innovation and attract talented people from across the world to work together and prepare the Emirates for life after oil.⁶

For the UAE, a collaboration in outer space is relevant; in this regard, the foundation of the UAE Scientific Advisory Committee—a part of UAE main strategic objective in outer space—allows the UAE researcher to collaborate with Indian researchers.⁷ As collaboration between India and the UAE in space programmes is viewed as highly promising, both countries want to transform the Space sector into a reliable source of income. However, with successful Space missions since 2014, the UAE emerged as a pioneer in the outer space domain among the Gulf countries, which includes the formation of the Arab Space Cooperation Group by the UAE in March 2019, headed by the UAE to develop 813 Satellite Project.⁸ The project will develop a spacecraft which will conduct hyperspectral data processing and monitor climate and environmental-related issues and will launch its first satellite in 2024.

With ample experience and successful outer space missions, India was able to carry out various Space research activities and missions with planned missions like Aditya-1 (for solar observation), Chandrayaan-3 (Lander and Rover), Gaganyaan Mission series and Shukrayaan-1 (Venus Orbiter). Further, India's ability to simplify already existing projects and launch them at a reduced cost is praiseworthy and this was visible in the Mangalyaan mission. Compared to the US Maven (Mars) Project, India's Mangalyaan

6. Sidhant Sibal, "We're Great Admirers of ISRO, says Omran Sharaf, Project Director of Emirates Mars Mission", *Wionews*, April 25, 2022, at <https://www.wionews.com/india-news/were-great-admirers-of-isro-says-omran-sharaf-project-manager-of-emirates-mars-mission-473814>. Accessed on December 1, 2022.

7. "Cabinet Approves Memorandum of Understanding between India and United Arab Emirates (UAE) on Cooperation in the Field of Industries and Advanced Technologies", PIB, June 8, 2022, at <https://pib.gov.in/PressReleasePage.aspx?PRID=1832176>. Accessed on December 1, 2022.

8. Ningthoujam, n. 5.

project cost 11 per cent of the US Mars project. India made a mark for itself in the world as Indian scientists were able to adopt best practices worldwide and deliver them cheaply.⁹

Cost is a determining factor for Space-faring nations, including the UAE, and India's ability to launch multiple satellites in one go makes it a valuable partner in outer space, and the UAE is aware of such prospects.¹⁰ With UAE having already invested around US\$ 5.4 billion to develop its outer space capabilities, the success the UAESA has achieved recently can't be ignored. Further, a significant part of the budget is meant for outer space research centres and implementing innovative projects. On the other hand, through public releases the UAE has revealed ambitious plans, such as the Venus mission and visit to the asteroid belt between Mars and Jupiter in the near future.

Enhancing Outer Space Cooperation

In September 2015, a visit by the UAE delegates to India to exchange experiences in the outer space set a favourable environment for further cooperation between India and the UAE. As Head of the delegates, Dr. Khalifa Al Rumaithi argues that as both countries enjoy strong ties there is a need for closer relationships and sharing of their valuable experiences in outer space exploration which will be mutually beneficial.¹¹ The successful launch of the UAE Hope Probe in February 2021 made UAE the fifth nation to establish such a feat as it was able to find two key observations to understand Mars' atmosphere. However, such accomplishments couldn't have been achieved without K. Radhakrishna's support, former Chief of ISRO and instrumental in the success of India's Mangalyaan mission, who was part of the UAE advisory board looking into the Mars project.¹² The success of the mission highlights that the UAE placed immense

9. n. 7.

10. Ibid.

11. Faisal Masudi, "UAE Space Agency Explores Cooperation with India's ISRO", *Gulf News*, September 29, 2015, at <https://gulfnews.com/uae/government/uae-space-agency-explores-cooperation-with-indias-isro-1.1591990>. Accessed on January 25, 2023.

12. Monit Khanna, "How ISRO Contributed to Success of UAE's Hope Probe Mars Mission", *Indian Times*, February 10, 2021, at <https://www.indiatimes.com/technology/news/isro-success-uae-hope-mars-mission-533956.html>. Accessed on December 1, 2022.

trust on Indian expertise and the findings from UAE's Mars mission will help India in its next Mars Mission.¹³

R. Umamaheswaran, Scientific Secretary to ISRO, argues that data collected from the Hope probe, like the transport of dust and its movement and result on the loss of volatile from Mars is valuable for India.¹⁴ He argues that these data will be a valuable input for India for its next Mars mission and pushed a new avenue for India-UAE bilateral ties. On the other hand, the UAESA Chairwoman, Sarah bint Yousef Al Amiri argues that both nations are engaged in scientific cooperation, and sounded hopeful that the UAE will explore ISRO's capability to provide low-cost launch capability to launch its smaller satellites from UAE.¹⁵ Further, Omran Sharif, the Project Director of Emirates Mars Mission appreciated ISRO's work and wants ISRO and the UAESA to be open to any new ideas and collaborate in the future.¹⁶ On the other hand, Hessa Al Matroushi, Science Lead of Emirates Mars Mission, acknowledges ISRO's contribution in the Space sector and further represents the voice of younger Space nations.¹⁷

However, considering the ongoing militarisation of Space and Space race between the US, Russia and China, the UAE, on the other hand, continues to adhere to its 'Space for Peace' motto and has pushed them to cooperate in outer space to benefit humanity. The UAE fears weaponisation of outer space will be harmful for humanity, and thus despite being a new Space-faring nation in the Space domain, it's working on setting things right along with collaborating with other Space agencies to give a new direction to others.¹⁸ Recently,

13. Masudi, n. 11.

14. Khanna, n. 12.

15. Gastón Dubois, "UAE is Interested in Indian Low-Cost Satellite Launch Vehicles", *Aviacionline*, October 29, 2021, at <https://www.aviacionline.com/2021/10/uae-is-interest-in-indian-low-cost-satellite-launch-vehicles/>. Accessed on December 1, 2022.

16. Sidhant Sibal, n. 6.

17. Sidhant Sibal, "Emirates Mars Mission's 'Science Lead' calls ISRO an 'Important Voice among World's Younger Space Nations'", *Wionews*, September 19, 2022, at <https://www.wionews.com/india-news/emirates-mars-missions-science-lead-calls-isro-an-important-voice-among-worlds-younger-space-nations-517790>. Accessed on December 1, 2022.

18. "UAE's Moon Mission is a New Beginning for Space Cooperation", *Khaleej Times*, June 15, 2022, at <https://www.khaleejtimes.com/uae/uaes-moon-mission-is-a-new-beginning-for-space-cooperation>. Accessed on December 1, 2022.

the UAE launched the Falcon Eye System and under National Space Fund planned to launch the Sirb, a constellation small-scale satellite equipped with SAR technology.¹⁹ Such developments will improve UAE earth observation and image sensing capabilities and assist the UAE armed force's capabilities.

Although India and the UAE's military cooperation is primarily focused on addressing the security challenges in the Indian Ocean Region (IOR)—with each developing its military Space capabilities with minimal cooperation like data sharing—recently India has shifted its outer space priorities to protect and secure its national security.²⁰ Although India doesn't have a declared Space policy document till today, such a development came as a result of growing challenges from China along the LAC. In recent years, India established the Integrated Space Cell (2010), Defence Space Agency (2018), conducted ASAT exercise (2019) and is working to develop a US-like GIG-TSAT, a small satellite constellation for the net-centric mission, to name a few.²¹ Further, India is working to increase its military situational awareness capacity and put its Earth observation, surveillance and reconnaissance and the outer space deterrence capabilities in use to address the Chinese threat in LAC, IOR and in the outer space.

With India and the UAE developing and enhancing their outer space capabilities for military purposes, they have ensured they kept their relationship and cooperation in outer space non-military and use it for peaceful purposes only. As India's Minister of State

19. MEED, "UAE Launches Defence Satellite", *Aerospace Technology*, December 11, 2020, at <https://www.aerospace-technology.com/comment/uae-defence-satellite/>. Accessed on January 25, 2023. Also see, Mark Holmes, "The UAE Steps Up Space Ambitions with a New Fund and SAR Constellation Plans", *Via Satellite*, July 19, 2022, at <https://www.satellitetoday.com/government-military/2022/07/19/the-uae-steps-up-space-ambitions-with-a-new-fund-and-sar-constellation-plans/>. Accessed on January 25, 2023.

20. Rajeswari Pillai Rajagopalan, "India's Space Priorities are Shifting Toward National Security", Carnegie Endowment for International Peace, September 1, 2022, at <https://carnegieendowment.org/2022/09/01/india-s-space-priorities-are-shifting-toward-national-security-pub-87809>. Accessed on January 28, 2023. Also see, Kartik Bommakanti, "India's quest for a Small Satellite constellation", ORF, July 25, 2022, at <https://www.orfonline.org/expert-speak/indias-quest-for-a-small-satellite-constellation/>. Accessed on January 28, 2023.

21. *Ibid.*

for Atomic Energy and Space, Dr. Jitendra Singh argues, the UAE and India Space Cooperation is close to taking a giant leap, and both countries in recent years have prioritised bilateral outer space cooperation adhering to their 2016 MoU to use outer space for peaceful purposes.²² With UAE emerging as a Space Power, apart from sharing data in the past—UAE Science Data Centre plays a credible role—and UAE using India’s expertise, both nations remain optimistic of such cooperation. Given that India and the UAE have immense potential in the Space sector, India and the UAE are planning to explore joint start-up ventures in the advanced and emerging outer space technologies which will only strengthen the bilateral relationship.²³

UAE WIDENING ITS SPACE COOPERATION WITH CHINA

Despite India’s involvement in the Middle East region, China was able to establish itself as a valuable partner for the region, with cooperation in outer space being a new addition, and China was able to make technological inroads in the Middle East. According to China’s 2016 Arab Policy Paper, China has to upgrade its pragmatic cooperation with all Arab countries, and space satellite cooperation is to be one of China’s priorities.²⁴ Like India, in December 2015, China signed an agreement with UAE to jointly develop and collaborate on outer space exploration, satellites and study of Space Science. Since then, the collaboration between China and the UAE has increased in the Space sector which was reflected in a recent agreement signed between China National Space Agency and the UAESA on September 16, 2022, for UAE future Moon missions.

22. “Union Minister Jitendra Singh to lead Indian Delegation to UAE at Abu Dhabi Space Debate”, ANI News, December 4, 2022, at <https://newsonair.com/2022/12/04/union-minister-jitendra-singh-to-lead-indian-delegation-to-uae-at-abu-dhabi-space-debate/>. Accessed on January 25, 2023.

23. “India Looks to Space Technology Cooperation with UAE”, *The Economic Times*, December 5, 2022, at <https://government.economicstimes.indiatimes.com/news/technology/india-looks-to-space-technology-cooperation-with-uae/96001753>. Accessed on January 26, 2023.

24. “Full Text of China’s Arab Policy Paper”, The State Council, The People’s Republic of China, January 13, 2016, at http://english.www.gov.cn/archive/publications/2016/01/13/content_281475271412746.htm. Accessed on December 3, 2022.

The agreement is the first Space project between China and the UAE, as Mohammad Bin Rashid Space Centre (MBRSC) will work with the Chinese space agency to land a rover using Chang'e 7 on lunar south pole in 2026. For its planned Rashid-2 rover, UAE wants to tap China's three impressive lunar exploration achievements, namely:²⁵

1. Chang'e 3, which put a rover on the moon's near side in 2013
2. Chang'e 4, which put a rover on the moon's far side in 2019
3. Chang'e 5, which brought back a Moon sample in 2020.

Such an agreement fits perfectly with the UAE's approach to become a prominent Space player and work with other prominent Space agencies for the greater good of humanity and transform itself as the technological hub of the world. The agreement was part of the UAE's larger moon mission with first Emirate Lunar Mission carrying the UAE's small rover 'Rashid', which weighs 10 kg, using a Japanese lander the Hakuto-R, atop the SpaceX Falcon 9 rocket, which recently was delayed for the fourth time.²⁶

OPPORTUNITIES FOR INDIA-UAE COOPERATION

India being a cost-effective Space Power—and considering the UAE budget for Outer Space operations—gives opportunity to launch the UAE's small satellites, engaged in scientific cooperation in the outer space, and now transfer of technology through a recently signed MoU between India and the UAE.²⁷ Such agreement gives a much needed thrust to the India-UAE joint collaboration in Outer Space

25. Mike Wall, "China, UAE will Collaborate on Moon Rover Missions", *Space*, September 17, 2022, at <https://www.space.com/china-uae-moon-rover-missions>. Accessed on December 1, 2022. Also see, Mark Zastrow, "China and United Arab Emirates plan lunar rover mission", *Astronomy*, October 28, 2022, at <https://astronomy.com/news/2022/10/united-arab-emirates-expands-lunar-plans-with-chinese-collaboration>. Accessed on December 1, 2022.

26. Nandini Sircar, "UAE Moon Mission: Rashid Rover Launch Delayed for Fourth Time", *Khaleej Times*, December 1, 2022, at <https://www.khaleejtimes.com/uae/uae-moon-mission-rashid-rover-launch-delayed-again>. Accessed on December 3, 2022.

27. Russell, n. 4. Also see, Siby Tripathi, "UAE could Explore India's Low-Cost Launch Vehicles to Liftoff Small Satellites | Exclusive", *India Today*, October 28, 2021, at <https://www.indiatoday.in/science/story/isro-uae-space-agency-hope-probe-launch-vehicle-pslv-gslv-sarah-al-amiri-1870092-2021-10-27>. Accessed on January 23, 2023.

exploration which will come in handy in joint research and Space missions in future.²⁸ Further, India permitted UAE-based Indian companies to invest in India's Space Programme, and such new FDI policies will make the outer space attractive for foreign investors to invest in India. As India and the UAE appreciate each other's efforts in the outer space and look for opportunity to cooperate, they recently planned to conduct a joint experiment to collect aerosol data from the upper atmosphere.²⁹

With the UAE's intent to become a knowledge hub in the Middle East region and a prominent player in Outer Space—given India's vast experience, knowledge and manpower—the UAE could employ Indian researchers and expertise as a quality educator.³⁰ Further, UAE could join ISRO's educational outreach programmes like UNISpace Nanosatellite Assembly and Training (UNNATI) to develop small satellites which will only enhance India-UAE Space cooperation.³¹

However, concerning the IOR, a region of interest for India and the Middle East countries, to name a few, India's IRNSS—or, now called Navigation with Indian Constellation (NavIC)—provides Middle East countries a new Satnav option to utilise with a better accuracy up to 5 metres.³² Such a detailed accuracy in the region complements the July 2018 MoU and February 2022 agreement signed between India and the UAE to further expand technological cooperation, and widened cooperation in disaster management services, and enhance maritime security cooperation to counter piracy and cross-border terrorism in the region.³³ With the UAE

28. "India-UAE Virtual Summit", Press Information Bureau, February 18, 2022, at <https://pib.gov.in/PressReleaseDetail.aspx?PRID=1799391>. Accessed on November 29, 2022. Also see, Russell, n. 4.

29. Sajila Saseendran, "Expo 2020 Dubai: India to Boost Space Partnerships with UAE, say ISRO Officials", *Gulf News*, October 17, 2021, at <https://gulfnews.com/expo-2020/news/expo-2020-dubai-india-to-boost-space-partnerships-with-uae-say-isro-officials-1.83010824>. Accessed on December 1, 2022.

30. "Space Exploration: UAE and India Space Cooperation", *Study Corgi*, December 19, 2022, at <https://studycorgi.com/space-exploration-uae-and-india-space-cooperation/>. Accessed on January 27, 2023.

31. Saseendran, n. 29.

32. Mrigank Chakraborty, "Difference between GPS and NavIC", *Jagran Josh*, September 28, 2022, at <https://www.jagranjosh.com/general-knowledge/difference-between-gps-and-navic-1664371049-1>. Accessed on January 28, 2023.

33. "Invest India and UAE Ministry sign MoU for Technological Cooperation", Press Information Bureau, Government of India, Ministry of Commerce & Industry, July

developing its navigational system since 2021, complementing the existing four global navigational satellite systems, provides India with an opportunity to utilise, align it with the NavIC and further share its expertise.³⁴

The India-UAE relationship has the potential to expand and further utilise science, technology and innovation (STI) domain. India's strong base in science and technology, which includes the STEM education, Space and nuclear domain, gives them ample opportunities to transform the nature and scale of their engagement. Again, there are various spatial spheres where India and UAE could strengthen their ties, such as in satellite navigation, satellite-based rescue missions and maritime security. Thus, it depends upon the synergy between ISRO and the UAESA and how effectively they cooperate and work together.

UAESA Director, General Salem Butti Salem Al Qubaisi, called India-UAE Space cooperation historic and lauded India's efforts to enhance the UAE Space Sector, and opines that the new set-up will benefit both countries.³⁵ Jitendra Singh observes that India-UAE joint Space cooperation has taken a big leap in the Arabian peninsula with India and UAE looking for ways and opportunities to complement each other's contribution to further strengthen India-UAE bilateral relationship.³⁶ With UAE providing a window of opportunity to India, ranging from cooperation in outer space to ground in the form of data

27, 2018, at <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1540480>. Accessed on January 28, 2023. Also see, Dipanjan Roy Chaudhury, "India, UAE Agree to Jointly Fight Terror, Enhance Maritime Security Coop", *The Economic Times*, February 19, 2022, at <https://economictimes.indiatimes.com/news/economy/foreign-trade/india-uae-agree-to-jointly-fight-terror-enhance-maritime-security-coop/articleshow/89672735.cms>. Accessed on January 28, 2023.

34. "UAE to Launch Navigation Satellite", *The Gulf Indians*, August 12, 2020, at <https://www.thegulfindians.com/uae-to-launch-navigation-satellite/>. Accessed on January 28, 2023.

35. Surendra Singh, "India Laying out New Space Infra and Opening up Sector will Benefit us Too: UAE Space Agency DG", *The Times of India*, December 7, 2022, at <https://timesofindia.indiatimes.com/india/india-laying-out-new-space-infra-and-opening-up-sector-will-benefit-us-too-uae-space-agency-dg/articleshow/96043445.cms>. Accessed on January 28, 2023.

36. "India, UAE Space Pacts to Take Big Leap in the Arabian Peninsula: Jitendra Singh", *Livemint*, December 4, 2022, at <https://www.livemint.com/news/india/india-uae-space-pacts-to-take-big-leap-in-arabian-peninsula-jitendra-singh-11670160170184.html>. Accessed on January 28, 2023.

sharing, pushing for joint start-ups in the emerging and advanced technologies, a voice in the IOR and to keep India's interest in the region secured. As to cooperation in outer space, Amiri argues that the UAE looks for cooperation on a case-by-case basis considering how it can benefit the UAE and the partner country; and in the case of India, the UAE is looking for ways to expand the area of cooperation in the outer space and India-UAE relationship.³⁷ Thus, India needs to be watchful of the cost-benefits of such growing India-UAE outer space cooperation to ensure it remains healthy and beneficial for the UAE along with ensuring that India's strategic interests on the ground and in the outer space are protected.

CHALLENGES AHEAD

With the growing Space race the militarisation of outer space has become a warfighting domain between the Space powers, the US, Russia and China, and has impacted the need to protect the global commons of Space.³⁸ Considering the global society has become dependent on the outer space, over the years, the outer space has proven its potential in the advancement in science and technology and assisted in nations' economic growth. Further, the growing congestion in outer space and with threat of Space debris, militarisation of Space remains an issue of enemy satelliting, hovering over a particular region of a country, and this pushed India and the UAE to develop Space Situational Awareness (SSA) observatories with the Starscapes Observatory and SAASST Sharjah Optical Observatory, respectively.³⁹ The presence of Russian satellites over

37. Surendra Singh, "We can Collaborate with India on Mutually Beneficial Space Programmes: UAESpace Agency Chief", *The Times of India*, December 15, 2022, at <https://timesofindia.indiatimes.com/india/we-can-collaborate-with-india-on-mutually-beneficial-space-programmes-uae-space-agency-chief/articleshow/96239377.cms>. Accessed on January 23, 2023.

38. Jun Nagashima, "The Militarization of Space and its Transformation into a Warfighting Domain", The Sasakawa Peace Foundation, July 17, 2020, at https://www.spf.org/iina/en/articles/nagashima_02.html. Accessed on January 23, 2023.

39. "India's First Observatory to Monitor Space Activity to Come up in Uttarakhand", *The Economic Times*, August 22, 2022, at <https://economictimes.indiatimes.com/news/science/indias-first-observatory-to-monitor-space-activity-to-come-up-in-uttarakhand/articleshow/93708235.cms>. Accessed on January 28, 2023. Also see, Ilias Fernini, "The UAE Space Situational Awareness Program at the Sharjah Academy for Astronomy, Space Sciences, and Technology", *Aerospace Research Central*, November

the Indian subcontinent before the Russia-Ukraine conflict, and the possible presence of Chinese satellites in the future over the IOR or Indian subcontinent, gives India and the UAE an opportunity to align their SSA's approach to protect and secure their aligned interests in the IOR.⁴⁰

On the other hand, the ongoing militarisation of outer space and the Space race have put private players and emerging Space powers at risk to utilise the benefits of outer space for national gains and security.⁴¹ To address such challenges and explore the outer space for the betterment of humankind, the UAE recently organised the first edition of the Abu Dhabi Space Debate (ADSD) with the aim of achieving global cooperation, setting standards and to set up a policy for outer space. The debate pondered over Space security, sustainability, accessibility and the role of private players in Outer Space. The debate provided a global forum for nations, Space industries, business leaders and policymakers to jointly address the issues humanity is facing such as the impact of climate change, and that outer space is facing which will push for innovation in the outer space.⁴²

Singh argues that the debate is a major development and achievement by the UAE and primarily reflects how the UAE views the outer space and its commitment towards the Space sectors.⁴³ He affirmed that the development would bring India and the UAE closer together and also strengthen their joint commitment to use the outer space for the benefit of humanity in a peaceful manner. As India reiterates, outer space as a sector is valuable for the future prospects of humanity and thus today there is a need to bring all

3, 2021, at <https://arc.aiaa.org/doi/10.2514/6.2021-4089>. Accessed on January 28, 2023.

40. Ibid.

41. Nagashima, n. 38.

42. Sidharth MP, "UAE to Host Representation from India, US, China, Europe for 'Abu Dhabi Space Debate'", *Wionews*, September 12, 2022, at <https://www.wionews.com/world/uae-to-host-representation-from-india-us-china-europe-for-abu-dhabi-space-debate-515394>. Accessed on December 1, 2022.

43. Dr. Ankit Srivastava, "India Reiterates its Strong Cooperation with the UAE in Space Sector at the Abu Dhabi Space Debate", *New Delhi Times*, December 13, 2022, at <https://www.newdelhitimes.com/india-reiterates-its-strong-cooperation-with-the-uae-in-space-sector-at-the-abu-dhabi-space-debate/>. Accessed on January 28, 2023.

stakeholders together to ensure and shape the potential of Space only to make human lives better.⁴⁴

With India and the UAE emphasising the outer space collaboration to strengthen their relationship, India needs to up its game as the success achieved by the UAE provided India with a valuable Space-faring ally on the one hand, and on the other, India as a considerate Space power ally for the UAE for its future Space missions. Toward ensuring that outer space remains safe, it has become a prominent issue in recent years. Sivan argues that it is the collective responsibility between the government and non-government agencies, and ISRO could play a supportive and valuable role in all international collaborations which intend to benefit humanity.

India and the UAE are looking for ways to judiciously explore the outer space and have expanded the scope of working jointly and coordinating from the research level domain to launching projects. India is in a better position with proven tech capability and manpower to explore the outer space and its cost-efficient Space project and programmes could assist Middle East nations such as the UAE to trump China in ongoing Space Diplomacy in the region in coming years.⁴⁵ Considering the recent agreements and MoUs signed between India and the UAE, India needs to derive benefits from growing healthy ties with the UAE and to ensure it remains mutual to address the growing challenges and concerns like the impact of climate change and the militarisation of outer space that the world is facing today.⁴⁶

CONCLUSION

Considering current ties between India and China and growing power politics between China and the US have resulted in the emergence of Space blocs led by the US—which includes 20 nations and the UAE on the one hand, and Russia and China on the other—

44. Ibid.

45. Akshay Narang, "India and China are Competing at Space Diplomacy in West Asia and India Seems to be Winning", *Tfipost*, July 29, 2022, at <https://tfipost.com/2020/07/india-and-china-are-competing-at-space-diplomacy-in-west-asia-and-india-seems-to-be-winning/>. Accessed on January 23, 2023.

46. Singh, n. 35.

and created challenges for other new Space-faring nations to explore outer space.⁴⁷ Despite lack of NavIC global coverage and inefficiency in quantum satellite communications against China's Space collaboration with West Asian nations and the Asia-Pacific Space Cooperation, it has become a major concern for India in its position in the Middle East. However, India has ensured it will assist key geostrategic countries like the UAE to develop its Space capabilities to meet up with Abu Dhabi's desperate need to make a mark in outer space as they have high hopes for ISRO. On the other hand, the ADSD gives India and the UAE an opportunity to work together and explore joint ventures in the start-ups in the emerging Space technologies. India and the UAE aim for peaceful use of outer space for humanity with SSA giving them another opportunity to cooperate and align and secure their strategic interests on the ground. In coming years, they have to navigate carefully to secure their national and strategic interest, strengthen their relationship and further not get impacted by the ongoing Space power politics.

47. Theodora Ogden, "Wealthy Nations are Carving up Space and its Riches—and Leaving Other Countries Behind", June 7, 2022, at <https://astronomy.com/news/2022/06/wealthy-nations-are-carving-up-space-and-its-riches-and-leaving-other-countries-behind>. Accessed on January 25, 2023.