

(This is a print copy of the Original Digital Publication - Global Space Business Bulletin)

# GLOBAL SPACE BUSINESS BULLETIN

(A Digital Newsletter for Space Exploration,  
Commercial Aviation & Defence Industry)

September 2022



**GSLV- Mark - III**  
**ISRO**

## The Global Trade Driver

(An International Forum on Industry and Education)

## Explore The Space

(Promoting STEM Education & Space Exploration  
awareness in Schools & Colleges across Geographies)



For Readers across the World -  
Government Space Agencies, Space Companies,  
MSMEs, Research Institutions, Colleges,  
Investment Agencies & Others

Global Space Business Bulletin is an initiative of  
The Global Trade Driver & Explore The Space

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# Global Space Business Bulletin

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### The Global Trade Driver

(An International Forum on Industry and Education)

Established in 2010, The Global Trade Driver (TGTD), is a niche facilitator of Businesses connecting Indian companies within the domestic market and International Markets, particularly USA through Business Delegations, B2B meetings, Strategic Consultancy, Advocacy and other programmes.

**Explore The Space**  
(Promoting STEM Education & Space Exploration  
awareness in Schools & Colleges across Geographies)

Explore The Space is an  
"ISRO - Registered Space Tutor"



"Explore The Space", Chennai, India, is an "ISRO - Registered Space Tutor", educational venture and an NGO working to promote awareness on Space Sciences and Technology among Schools and Colleges through seminars, quiz programmes, study tours and research. ETS connects Institutions and Industry through its programmes.

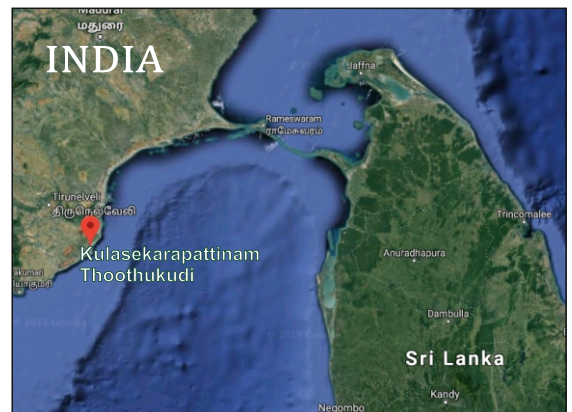
# A New Space Port in INDIA – Kulasekarapattinam

## Unleashing new opportunities for the Space Industry Supply Chain

In a land area spread over 2,000 acres, a new spaceport is coming up at Kulasekarapattinam in Thoothukudi district in Tamil Nadu. A spaceport at Kulasekarapattinam will provide a strategic advantage to ISRO as small satellites launched from this place need not fly a circuitous path to avoid the land mass of Sri Lanka, which is currently the case for launches from Sriharikota. The new launchpad will help ISRO save fuel and have a dedicated space for launching Small Satellite Launch Vehicles (SSLV).

Speaking at a recent event in Coimbatore, Tamil Nadu, Mr. S. Somnath, Chairman, ISRO, said, *“It will take two years to set up the facility, which will have a new launchpad, radar, ground stations, tracking systems and safety systems, among others.”*

The new space port will be used to primarily launch small satellites that weigh less than 500 kilos. Smaller rockets are easier to build, assemble, and launch with less time in comparison to their larger counterparts. Further as the demand for utility and hence the demand for small satellites are expected to be much larger than that of the currently used large ones, it is important for India to have a dedicated spaceport for such smaller rockets. Smaller rockets are also attractive to foreign and domestic customers who are looking to launch small satellites at low costs.



### The growing demand for small satellites

The small satellite market revenue totalled ~US\$ 3.05 Bn in 2020, according to Future Market Insights (FMI), and is expected to reach ~US\$ 12.9 Bn by 2031. Small satellite deployments will continue to accelerate due to the development of satellite communication and automation technologies. This is driven by factors such as increasing small satellite missions, need for earth observation and remote sensing, uninterrupted satellite communication, and developments in Global Navigation Satellite System (GNSS).

Small satellites find numerous applications in the field of weather forecast, satellite communication, defence, space research, GPS.

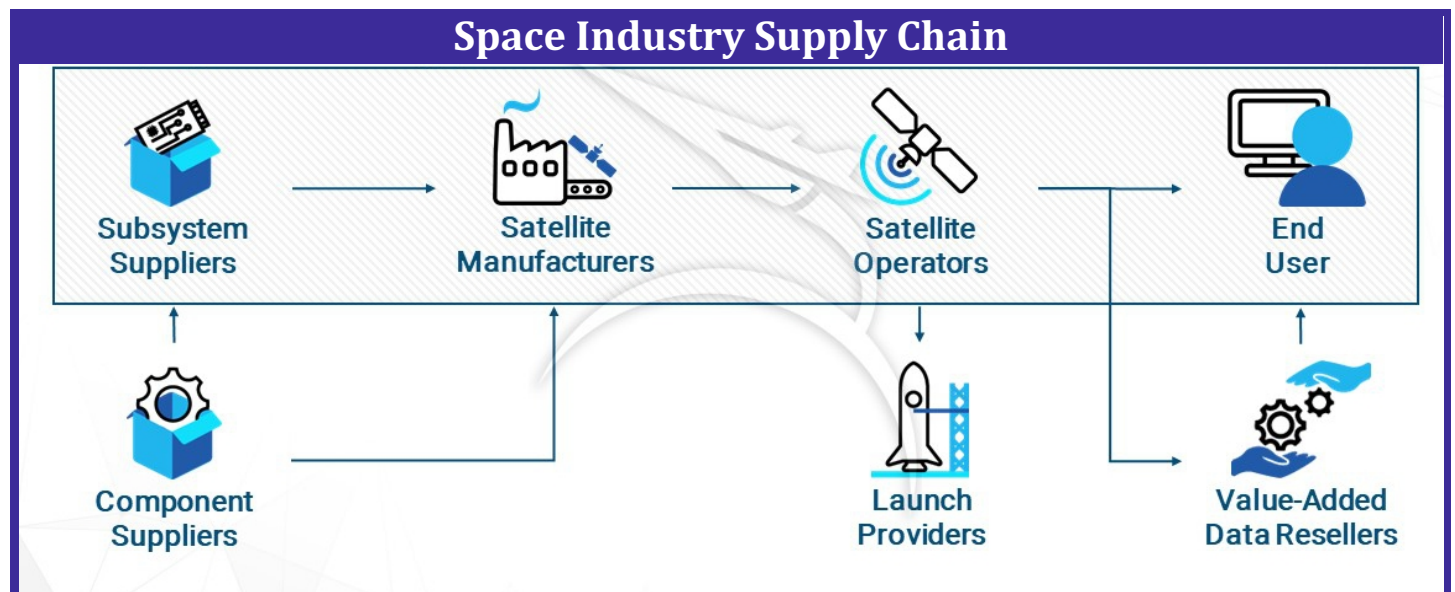
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Earth observation services cover the detection of climatic changes, monitoring of agricultural fields, meteorology and disaster mitigation. There is an increase in the requirement of high-resolution earth imaging across many verticals, as these images can be used for various purposes like precise management of water, land and forest resources.

The United States government is topping the list for being the largest purchaser of satellite imagery. This is one of the reasons, most small satellite companies are seeing the US government as a stable long-term customer.

Small satellite market like many others also witnessed challenges including disruptions in supply chain of raw materials and logistical challenges. While sales dampened temporarily, manufacturers took up research and development activities to offset decreasing sales.

However, the recent increase in development of ride-sharing systems and specialized satellite-launch solutions by market players like SpaceX, Blue Origin and Virgin Galactic is expected to revive the growth of the smaller satellite industry.



A launch pad is a platform from which a rocket is launched, and they're found at facilities called launch complexes or spaceports.

A typical launch pad consists of a pad and a launch mount, a metal structure that supports the upright rocket before it launches. Umbilical cables from the launch mount provide the rocket with power, cooling liquids, and top-up propellant before launch. The structure also helps shield the rocket from lightning strikes.

Different launch complexes have different ways of putting rockets on launch pads. Launch pads also have features that minimize damage from the rocket's launch. When a rocket first ignites, valves lining the launch pad spray hundreds of thousands of gallons of water into the air around the exhaust, which helps lessen the rocket's deafening roar. Trenches beneath the launch pad also direct the rocket's exhaust out and away from the craft, so the flames can't rise back up and engulf the rocket itself.



## “We want to do business with India”



**Tim Dyer, President,  
Elcon Precision LLC, USA**

“Tim Dyer, is the President of the Material Science firm, Elcon Precision in San Jose, USA. Elcon specializes in photochemical machining, metallization of ceramics and brazed assembly services. With a Bachelors and Masters in Materials Science and Engineering, from University of California, Davis, creating and making products at nexus of energy, fabrication technologies, and materials science is the special feature of the distinguished career of Tim.”

**If you are to be asked the three most important things/developments that have happened in the Space / Aerospace Industry, in the recent past, what will they be?**

Semiconductor industry innovations – High speed, large memory, Lithium-ion batteries, and compact computers augment human capabilities to control and manage a space flight vehicle; Development of advanced digital imaging sensor technology for data capture and ion engines for microsatellites and long-range space flight.

### *“The Indian Market is very exciting”*

**What is your opinion on the Indian Market?**

The Indian Market is very exciting. It offers a lot of opportunities for a company like us and we look forward to working with Indian Customers & suppliers.

**Metals comprise the largest part of Rockets / Launch Vehicles. Is there enough and quick innovation taking place to discover lighter (lesser in weight) and stronger metals?**

- 3-D printing of both high entropy alloys (HEA) and difficult-to-manufacture composite aluminium alloys will help reduce weight.
- Metal-ceramic composites also offer promise as lightweight materials with better properties >500C.
- Laminar material designs made via layer based additive manufacturing processes also offer higher temperature and light weight performance.

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*Elcon Precision Seeking Suppliers: Precision Ceramic Components, Metal Forming and Electronic Components with Laser Machining Capabilities.*

*Elcon Precision Seeking Customers: Metallization of Alumina. Aerospace Electronic Components, Aerospace Components Assemblies, Photo Chemically etched parts*



**What are the major technology breakthroughs / advancements that you have seen in your Company / Business in the last 5-10 years?**

- **Ion engines in space craft and micro satellites have created opportunities.**
- **New and advanced non-contact inspection equipment is less costly and has enabled us to improve quality. Systems like optical CMMs and digital X-Ray systems.**
- **SPC Software has improved and is easier to use, also enabling us to determine risks and process stability.**
- **Direct imaging systems for photolithography enable us to make small high purity refractory metal (Tungsten, Molybdenum) components for joining and brazing hermetic assemblies.**

**Some of the parts manufactured by Elcon Precision LLC**



*With the launch of the National Mineral Policy 2019 and the Mines and Minerals (Development and Regulation) Amendment Act 2021, India presents a major opportunity for investors looking to invest in the metal industry in India. India has large reserves of Iron ore, Bauxite, Chromium, Manganese ore, Baryte, Rare earth and Mineral salts.*



**PSLV - Designed & operated by ISRO**

# ISRO – “Pride of India”



**Vikram Sarabhai**  
**First Chairman & Founder of ISRO**

Dr. Sarabhai is considered as the Father of the Indian space program; He was a great institution builder and established or helped to establish a large number of institutions in diverse fields. He was instrumental in establishing the Physical Research Laboratory (PRL) in Ahmedabad.



**S. Somanath**  
**Current Chairman of ISRO**

Shri. Somanath is an expert in the area of system engineering of Launch vehicles. His contributions in PSLV and GSLV MkIII are in their overall architecture, propulsion stages design, structural and structural dynamics designs, separation systems, vehicle integration, and integration procedures development.

Headquartered in Bangalore, ISRO, the National Space Agency of India, operates under the Department of Space (DOS) which is directly overseen by the Prime Minister of India.

ISRO is India's primary agency for performing tasks related to space-based applications, space exploration and the development of related technologies. It is one of six government space agencies in the world which possess full launch capabilities, deploy cryogenic engines, launch extraterrestrial missions and operate large fleets of artificial satellites.

ISRO has the world's largest constellation of remote-sensing satellites and operates the GAGAN and NAVIC satellite navigation systems. It has sent two missions to the Moon and one to Mars.

ISRO's programs have played a significant role in the socio-economic development of India and have supported both civilian and military domains in various aspects including disaster management, telemedicine and navigation and reconnaissance missions. ISRO's spinoff technologies also have found many crucial innovations for India's engineering and medical industries.

## Some of the key achievements of ISRO include

1. *Launch of INSAT*
2. *Development of RLV*
3. *Launching the heaviest commercial mission in 2015*
4. *GSLV MK3*
5. *Launched 104 satellites in one mission*
6. *Mangalyaan - Mars Mission*
7. *Chandrayaan's Moon Mission*

ISRO has the world's largest constellation of remote-sensing satellites and operates the GAGAN and NAVIC satellite navigation systems. It has sent two missions to the Moon and one to Mars.

ISRO has been the pioneer space exploration agency of the Government of India and has successfully demonstrated its unique and cost-effective technologies which has made it one of the elite space agencies in the world over the years.

With clearly defined social goals, ISRO has emerged as a leading Space Agency in the World.

## Key Missions of ISRO in the very near future:

1. **Gaganyaan:**  
**India's first manned mission to Space**
2. **Aditya - L1**  
**India's first mission to study the Sun**
3. **Chandrayaan - 3**  
**India's next moon mission**



# Bengaluru Space Expo



India's space sector has made tremendous growth over the decade. The Countries Participation in space programmes have been highly remarkable, with vigorous and determined efforts of ISRO.

Taking the vision of the government of India in enhancing private sector participation in Space sector, Confederation of Indian Industry (CII), in association with the Indian Space Research Organization (ISRO), has been organizing the Bengaluru Space Expo (BSX), a biennial international Exhibition and Conference, since 2008.

The 7th Edition of BSX 2022, organized in association with ISRO, Indian National Space Promotion and Authorization Centre (IN-SPACE) and NewSpace India Limited (NSIL) is scheduled from 5 – 7 September 2022 at BIEC in Bengaluru, India.



Besides the exclusive Exhibition, the three-day event will have a concurrent International Conference, with the theme, 'Nurturing the NewSpace in India' and would provide an ideal platform to Indian and International space agencies and companies in this sector, to showcase their strength & capabilities in the space arena; network and explore the opportunities of partnerships.

The Exhibition will have participants from over 100 companies/organisations from around 15 countries, showcasing advanced technologies and products for the space sector, in an exclusive hall.

## Space Events Across the World

1. **BSX 2022** – Schedule: 5-7 September 2022

Place: BIEC, Bengaluru, India

Intent: Apart from exploring business partnerships with ISRO, there would be stakeholders' interaction and exhibition themed 'Nurturing the New Space in India', which is to showcase engaging space agencies across the world. **Website:** [bsxindia.com](https://bsxindia.com)



2. **Space Tech Expo, Europe** Schedule: 15 – 17, November 2022 | Place: Bremen, Germany Intent: A business event that would address the prospects of space Industry expansion and market resilience in the wake of pandemic. Learning about low earth orbit satellite system development challenges with simulation technology, scaling up space business and micro launch market.

**Website:** [spacetechempo.eu](https://spacetechempo.eu)



3. **Space Ops 2023 – 17th International Conference on Space Operations**

*Schedule: 6-9 March 2023 Place: Dubai World Trade Center, UAE.*

Intent: The theme of the conference is 'Invest in space to serve earth and beyond'. This event is held once every two years to help nations explore the latest technologies and opportunity for deliberating on deep space aspects of space operation. **Website:** [spaceops2023.org](https://spaceops2023.org)





4. Satellite 2023 – *Schedule: 13 – 16 March 2023 | Place: Washington, DC*

Intent: To learn how satellite and terrestrial cellular companies can work together as Valuable partners, hybrid networking, providing backhaul services and beyond and access to thought leaders and innovators.

Website: [satshow.com](https://satshow.com)



5. 2022 ASCEND – *Schedule: 23-25 October 2022 | Place: Las Vegas, Nevada and online*

Intent: To find endemic partners to expand, reach and broaden space market. To pressure test ideas and forecast emerging trends. To test new products and connect with experts.

Website: [ascend.events](https://ascend.events)

## Space Tech Expo Events, USA - May 2022



# ASEAN Space Industry – Aspirations for Self-Reliance Driving the Growth

ASEAN – Association of Southeast Asian Nations – is an organization of profound significance for the future – strategically, economically, and diplomatically. ASEAN is constituted by representatives from ten Southeast Asian Countries – Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam – into one organization.



Many of the Southeast Asian countries started investing in space technology since few decades ago. Indonesia, for example, established its space agency NATIONAL INSTITUTE OF AERONAUTICS AND SPACE, Indonesian: LEMBAGA PENERBANGAN DAN ANTARIKSA NASIONAL- LAPAN) was established in 1963. For its part, Thailand in 1971 established a ground-receiving station to utilise data from the Earth Resources Technology Satellite-ERTS-1 which later named as LANDSAT-1 by UNITED NATIONS SPACE AGENCY NASA; the ground-receiving station was the first in Southeast Asia. In 1979, Vietnam sent its first citizen to space through the Soviet Union's Interkosmos programme.

According to a report by Euroconsult ( An international Consulting and research firm specialising in Space Activities) as quoted in newspaper reports[iv], in 2012, Vietnam was the largest spender within the ASEAN group with US\$93 million, followed by Laos (US\$87 million), Indonesia (US\$38 million), Thailand (US\$20 million), and Malaysia (US\$18 million).



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The space programmes of the various Southeast Asian countries share common characteristics. For one, international cooperation plays a key role in the development of these space programmes. These countries recognize the importance of collaborating with nations that have logged in more years in space activities, have the financial resources and skills, and are willing to assist in nurturing the indigenous programmes of countries with less resources.



# Space Industry & Exploration in Africa



Karugaba Ivan

Twenty-one years after the first African satellite, SunSat-1, was launched to space by South Africa in 1999, the industry has accelerated with hundreds of millions USD invested into it.

Some of the advantages that the African Space Industry has are significant government support for the establishment of national and regional space programmes; intra-continental partnerships fostering space science collaboration; Africa's strategic and geographic locations that are suitable for astronomical and space physics facilities; established satellite assembly, integration and testing facilities; experience in the manufacture and/or operation of small satellites;

Space physics capability that leverages its proximity to the Southern Ocean islands, the South Atlantic Anomaly, and the study of the Equatorial Electrojets and existing and established centres focused on the exploitation of geospatial data.

A total of 20 satellites have been launched by African countries since 2016 totalling 41 satellites. Egypt leads the way with nine launched satellites, followed by South Africa with eight, Algeria with seven, Nigeria with six, and Morocco with three. Ghana, Sudan, Ethiopia, Angola, Kenya, Rwanda and Mauritius complete the list.

Two GEO telecommunications satellite was launched under an agreement with RASCOM, the Regional African Satellite Communication Organization, representing the interests of 44 African telecommunications operators, the first African telecommunication satellites covering the whole continent.

## Focus Uganda

In 1975, Uganda built her first earth satellite ground station at Mpoma in Kyaggwe, Mukono District. To Ugandans, the facility provided crisp color television (with international TV channels), and crackle-free international telephone calls.

Additionally, in the same year, Uganda setup another earth satellite ground station and medium wave station in Arua District. Two sites were established located in Ombaci, about 4KM north-west of Arua Town, and the 10KW medium wave transmitter in Giligili in Ediofe. Collectively, the government strategically used the satellite infrastructure for military communication and television while the medium wave was strictly for radio.

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Presently, Uganda needs to have her own satellite technology capabilities beyond ground stations because of the diverse needs and applications of satellite technology in weather forecasting; land, water and mineral mapping; agriculture monitoring; infrastructure planning; border security; and disaster prevention.

It is through appreciating the importance of Satellite technology that the Ugandan government, signed a collaborative research agreement with the Kyushu Institute of Technology (Kyutech), Japan. The agreement involved enrolling and upskilling three graduate engineers to design, build, test, and launch the first satellite for Uganda. By May 2022, Edgar Mujuni, Derick Tebusweke and Bonny Omara, had completed the development work on the 10 cubic metre satellite and was handed over to the Japan Aerospace Exploration Agency (JAXA) for final testing.

Through a collaboration with National Aeronautics and Space Administration (NASA), Uganda is scheduled to launch her first low Earth orbit satellite, the PearlAfricaSat-1 into space from the International Space Station in August 2022 and it will provide research and observation data, the ground station at Mpoma in Mukono District is also set to be upscaled.

## Focus Uganda

The Uganda People's Defence Force (UPDF), Uganda Telecom Limited (UTL) and the ministry of Science, Technology, and Innovation space programme will take charge of the ground station at Mpoma and will be directly in charge of ensuring Uganda makes strides in the spheres of Space Technology, exploration and education.

Compiled by Karugaba Ivan Junior,, Founder and CEO of Microfuse Computer Technologies, a local consumer and Industrial electronics design and manufacturing company.

Contacts;

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2. Dr. Cosmas Mwikirize, +256 782 964834 – Superintendent Industrial Value Chains, Science Technology and Innovation – Office of the President.

# Space Tech Expo



Gordon McHattie - Event  
Director of Space Tech Expo

Space Tech Expo, USA will happen in Long Beach, California, USA from May 2nd to May 4th 2023. It is America's leading showcase of space technology and services for spacecraft, satellite and launcher systems, subsystems, components and materials for civil, military and commercial space. Space Tech Expo USA exhibition and conference allows attendees to immerse themselves in the supply chain's very latest technologies, networking opportunities and topical debates within just a two-day period.



### TOPLINE FIGURES



## Space Tech Expo, Europe

The Space Tech Expo, Europe will happen in Bremen, Germany from 15th to 17th November 2022. It is the hot spot to secure your desired businesses deals, ground-breaking industry knowledge and innovative manufacturing solutions within just three-days this November. The exhibition is Europe's marketplace for space business, technology and innovation, and draws attendance of thousands of industry leaders, decision makers, engineers, specifiers and buyers to meet suppliers, manufacturers and integrators spanning the entire space supply chain.

*"Gordon McHattie , Director, Space Tech Expo says, " Space Tech Expo offers a great opportunity for both established as well as new Companies in the Space Industry Supply Chain . The Conference that we run alongside the Expo gives the event a great advantage as global experts in the Space Industry discuss on topics like Space Technology, Space Situational Awareness, Materials, Electronics, Artificial Intelligence Space Debris etc "*



# Building the Space Economy



**Dan Dumbacher**

Dan Dumbacher currently serves as the Executive Director of The American Institute of Aeronautics and Astronautics (AIAA). Mr. Dumbacher earned a bachelor's degree in mechanical engineering from Purdue University in 1981 and a Master's in Business Administration from the University of Alabama in Huntsville in 1984. He has completed the Senior Managers in Government study program at Harvard

University. He has received numerous awards and honors, such as the Silver Snoopy Award, and the NASA Distinguished Service Medal.

Building the space economy in low earth orbit is a unifying priority and this is reliant on constancy of purpose, as we move towards Moon, Mars and beyond. Technologies like Advanced Manufacturing, Artificial Intelligence, Robotics, Nanotechnology, Cybersecurity, Data Analytics – will have a lasting and positive impact on the Space Industry.

Future workforce is very important in the (A&D) industry. We need highly skilled workers. This is a significant concern, exacerbated by the global pandemic. Workforce Diversity and fostering inclusion by encouraging women and underrepresented minorities are important.

AIAA is encouraged by how many countries are engaging in the space economy... it's not just a few countries exploring and commercializing space – the democratization of space has begun.

Educational Institutions need to focus on systems engineering, or inter disciplinary engineering, which has become more and more important.



# Israel - “The Drone Capital of the World”



Mr. Joseph Avraham  
Consul - Trade &  
Economics Affairs  
Consulate General of Israel  
in Bengaluru

The Aerospace industry is a multi-discipline sector that includes manufacturing of the primary components of the industry and other production activities such as R&D as well as propulsion, navigation and communications and software development in addition to maintenance.

Israel's aerospace industry sector is well known with capabilities in UAV production and advanced space-launching. In addition, Israel has classic advantages in fields such as relatively low-cost but high-quality manufacturing for Western countries, innovation and entrepreneurship that produce advanced technologies and with operational experience of products.

Many Israeli companies are sub-suppliers that specialize in fields such as machining, electronic systems and components, and composite materials. Israeli companies collaborate with leading international enterprises. Said Mr. Joseph Avraham, Consul – Trade & Economics Affairs, Consulate General of Israel in Bengaluru.

Although the majority of satellite, defense and electronics technology development is conducted by the large Israeli corporations, the UAV segment is promoted by smaller Israeli manufacturers that develop exclusive technology

The metal, composite and electronics segments are promoted by multiple companies that apply manufacturing technologies and develop additional products used by the aerospace industry.

Israel is a significant UAV exporter in the world, with many advantages, such as manufacturing high-quality products at low cost; the innovation and entrepreneurship that produce highly sophisticated technologies. Israel is known as a world leader in the satellite industry, with the first mini satellites to be developed, and is one of a few countries in the world with independent launching capabilities.

The Israel space industry has also developed installed equipment capabilities as well as developing satellites and launching systems. The capabilities that Israel has developed make it a leader in nanosatellite technology, just as it was a leader in mini satellite technology. There are a number of Israeli start-ups developing new, ground-breaking civil commercial applications. Simulators are another area of expertise due to the increase in commercial air traffic and the higher demand for training tools and simulators with advanced technological capabilities.

The Israel Space Agency cooperates with many space organizations around the world, including cooperation agreements. Among the reasons the Israeli space and satellite industry is a global pioneer in small satellite technologies are the fact that it features high-quality human resources and highly effective work processes, the fact it is supported by Israeli cutting-edge academic activities, and that it constantly interacts with the renowned world-leading Israeli hi-tech sector.



## STEM Education & Space Exploration



N. Sudheer Kumar, Director, CBPO,  
ISRO, Bengaluru

The excitement and opportunities offered by Space Exploration are growing very fast. "Young minds need to develop critical thinking and scientific temper to bring about innovation to face the emerging challenges in the field of Space Technology



"Students have to be curious and ask questions about various scientific phenomena / facts happening around them. This will kindle their scientific temper... ISRO invites young minds to pursue space as a career." Said N. Sudheer Kumar, Director, CBPO, ISRO, Bengaluru at a STEM Event Held at St. John's English School, Amruthahalli, Bengaluru

Space exploration is all about teamwork. Each rocket launch takes years of work and hundreds of scientists and engineers working as a team. Getting into space (and back down) is hard, involving rockets and launch vehicles, satellites, spacecraft, re-entry systems, landers and rovers, robots, and orbital mechanics, not to mention hypothetical technologies like space elevators and artificial gravity. STEM workshops with focus on Space Science and Technology can be conducted to encourage students to take more interest in Space Exploration. A great advantage of such workshops is that it can help in identifying the right and budding talent that needs to be nurtured.

### Workshop components:

- Questionnaire on Space Sciences & Technology that was sent to the students two weeks before the workshop.
- Interesting videos on ISRO's history & Space Technology.
- Quiz on Space Technology.
- STEM Experiments.
- Certificate for Participants.
- List of questions from the previous programme to increase the curiosity of students.
- Pledge



RKM Saradha Vidhyalaya Model  
Girls School,  
Chennai - 27.04.2022



St. John's English School,  
Amruthahalli, Bengaluru - 05.03.2022

### Popular Questions from Students:

- What is the center of gravity of earth?
- How far we should go to escape from gravity?
- If oxygen increases in the earth, what will happen?
- Why should humans show interest in space research?
- Which is the deepest place in the earth?
- What is meant by solo star and group of stars?
- How satellites stay in their orbit without falling?

## Space Industry Market Place

The space industry should reach \$1 trillion in annual revenue by 2040, with launch costs dropping 95%, Citigroup analysts said in an extensive report published this month.

Private investment in space companies, especially from venture capital, has steadily broken annual records over the past decade. Last year, space infrastructure companies received \$14.5 billion of private investment.

### Scope

The Space Industry is projected to register a CAGR of 5.6% over 2018-2026.

In terms of categories, nano satellites segment is anticipated to account for one of the largest share of expenditure globally.

The Middle Eastern market is growing rapidly and European space majors can make rapid inroads into this market.

The fastest growing market from 2024 onwards will be China as the Chinese Government continues to make billions of dollars of investment in this industry





## Space Industry Market Place

S.No	Company Name	Looking For	Contact Details
1	<b>Sri Venkateswara Company</b> <b>Products:</b> Soild (6 Products), Semi-Tubular (6 products) , Tubular (6 products) <b>Station :</b> Coimbatore, Tamilnadu, India	<b>Seeking a tie up/joint venture to manufacturer updated engineering products, Any engineering product which attracts a good market, Support for manufacturing and Marketing a product.</b>	Address: S.F No: 626/1-2, Idikarai Road, Periyanaickenpalayam, Coimbatore, Tamil Nadu, 641022 Call: +91 (904)707-7874 Mail:marketing@srivenkateswara company.in Website: srivenkateswaracompany.com
2	<b>Elcon Precision LLC</b> <b>Products:</b> Vacuum Coaxial Switches Custom Grids Custom Screens Custom Bipolar Plates <b>Station:</b> San Jose, California, USA	<b>Precision Ceramic Components, Metal Forming and Electronic Components with Laser Machining Capabilities</b>	Address: 1009 TIMOTHY DRIVE, SAN JOSE, CA 95133 Call: 408-292-7800 <b>www.elconprecision.com</b>
3	<b>Lands Doctor at Glance</b> <b>Products:</b> Geotagging, Navigation, Land Demarking, Neighbourhood Analysis <b>Station :</b> Kondapur, Hydrerabad, India	<b>NRIs, Veterans, IT Professionals, Industries, Government Bodies</b>	<b>Kondapur, Hydrerabad, India</b> <b>Website: ww.landsdoctor.com</b>
4	<b>Tamilnadu Defence Industrial Corridor</b> <b>Products:</b> Common Facilities, Testing centers, Aerospace Hub, Defence parks, Government incentives, Skill development,PPP, Centre of Excellence <b>Station:</b> Egmore, Chennai-600 008, Tamil Nadu, India	<b>Looking for Manufacturer &amp; Service provider in the Aerospace &amp; Defence Domain, to setup their Specality in tamilnadu TNDIC Nodes</b>	Egmore, Chennai-600 008, Tamilnadu, India Email: info@tndefencecorridor.in  Contact: 044 – 28554479

# Space Business – Limitless Opportunities



D.V. Venkatagiri

ISRO, the Indian Space Agency has revolutionised Space Usage by cutting edge research, very competitive costs and meticulous planning. This has made ISRO, a very key player in shaping the Space Industry of the future.

Space Exploration has come a very long way since 1969 when Neil Armstrong set his foot on the Moon. High levels of private funding, advances in technology and growing public-sector interest are driving the Space Exploration Industry toward the stars. According to an estimate, the revenue generated by the global space industry may increase to more than \$1 trillion by 2040.

While aerospace technology used to be limited in a few countries, over the years, the scenario has changed quite a bit. A host of ambitious nations are boosting their space exploration programs, ensuring major competition in the field. The United States remains the leader of space activity, but many more countries are getting involved and increasing their investments. US accounts for approximately one-third of the operational spacecraft currently in orbit around Earth. With the help of the National Aeronautics and Space Administration (NASA), they have led many space exploration efforts-- from the Apollo moon-landing missions, the Skylab space station, International Space Station (ISS) to the Mars Exploration Rover and the latest Artemis Mission to Moon.



**An increasing number of investors are showing interest in the Space Exploration Industry as rocket launches have become much less expensive and the applications of are growing rapidly. This is resulting in thousands of more satellites—and many more people than ever before—venturing into orbit.**

Investors have recently focused on space ventures in low-Earth orbit, and there is growing interest in Moon and other Celestial bodies. An increasing number of investors are showing interest in the Space Exploration Industry as rocket launches have become much less expensive and the applications of are growing rapidly.. This is resulting in thousands of more satellites—and many more people than ever before—venturing into orbit. Of Course, more objects in space also mean more space debris and higher risks of collisions. With more satellites and space debris in orbit, it's time for a new approach for mitigating collisions.

New satellite constellations are on anvil, but their long-term success depends on substantial cost reductions. Advanced materials, Micro Satellites, Reusable launch vehicles, Small Satellite Launch Vehicles are some of the key areas fuelling more research and investments.

Space as an investment theme is also likely to impact a number of industries beyond Aerospace & Defense, such as IT Hardware and Telecom sectors, Online Education etc. According to an estimate from Morgan Stanley, the global space industry could generate revenue of \$1 trillion or more in 2040, up from \$350 billion, currently. Yet, the most significant short and medium-term opportunities are expected to come from satellite broadband Internet access.

**D V Venkatagiri, CEO**  
**Explore The Space & The Global Trade Driver**

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